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: Pathfinder Dam Historic District
Other names/site number: 48NA211 (Pathfinder Dam)
Name of related multiple property listing**: N/A**

2. Location

Street & number: 12 miles southwest of Alcova
City or town: Alcova State: Wyoming County: Natrona
Not For Publication: [ ] Vicinity: [X]

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:

_X_ national _X_ statewide _X_ local

Applicable National Register Criteria:

X A ___B _X_ C __D

Signature of certifying official/Title: **Date**

Title: Bureau of Reclamation, Federal Preservation Officer (Acting)

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	☒

Category of Property

(Check only **one** box.)

Building(s)	☐
District	☒
Site	☐
Structure	☐
Object	☐

Number of Resources within Property

Contributing	Noncontributing	
1	0	buildings
2	1	sites
9	6	structures
0	5	objects
12	12	Total

Number of contributing resources previously listed in the National Register 1

6. Function or Use

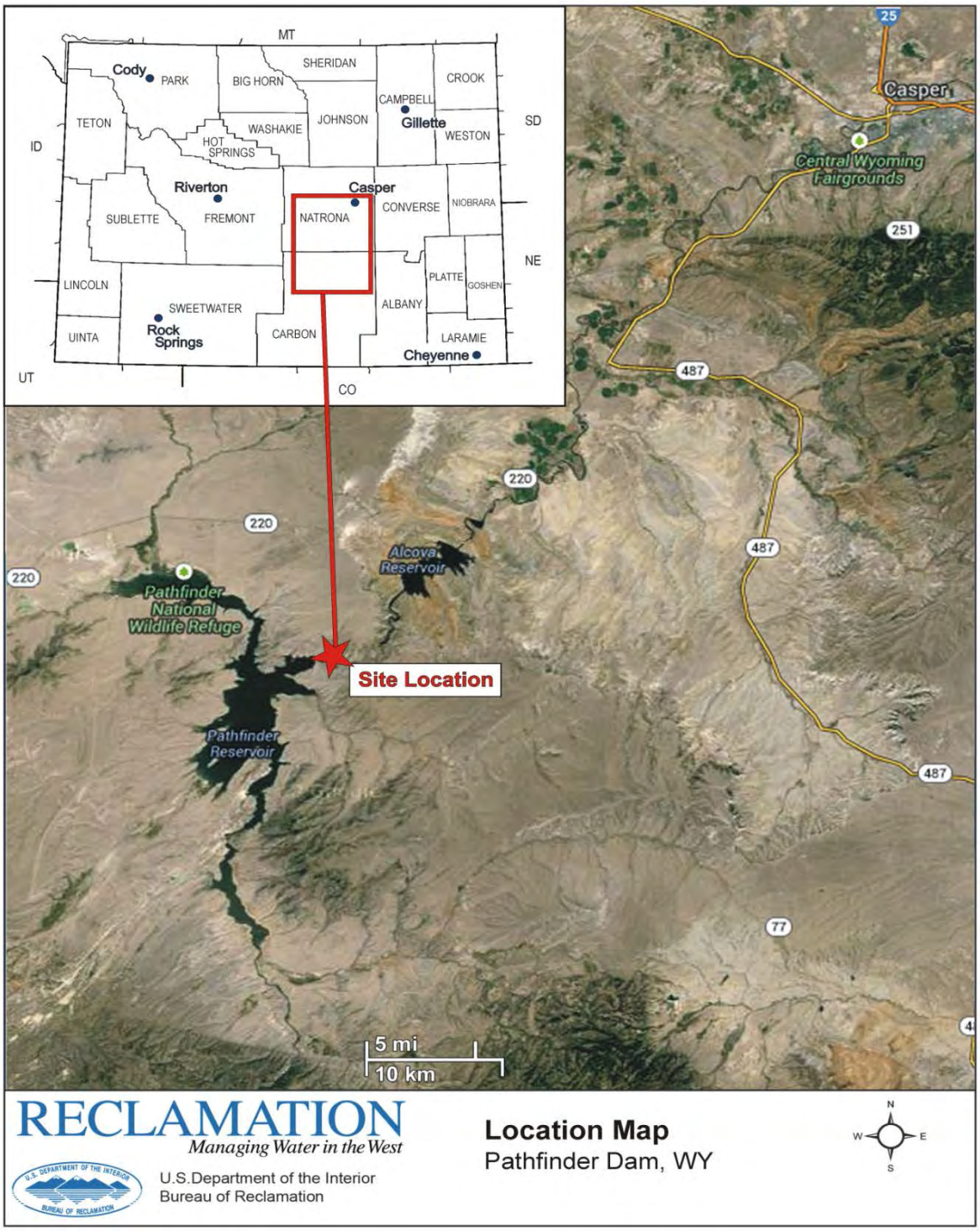
Historic Functions
GOVERNMENT/Public Works
INDUSTRY/Waterworks
DOMESTIC/Single dwelling, secondary structure
DOMESTIC/Camp
EXTRACTION/Extractive Facility

Current Functions
GOVERNMENT/Public Works
INDUSTRY/Waterworks

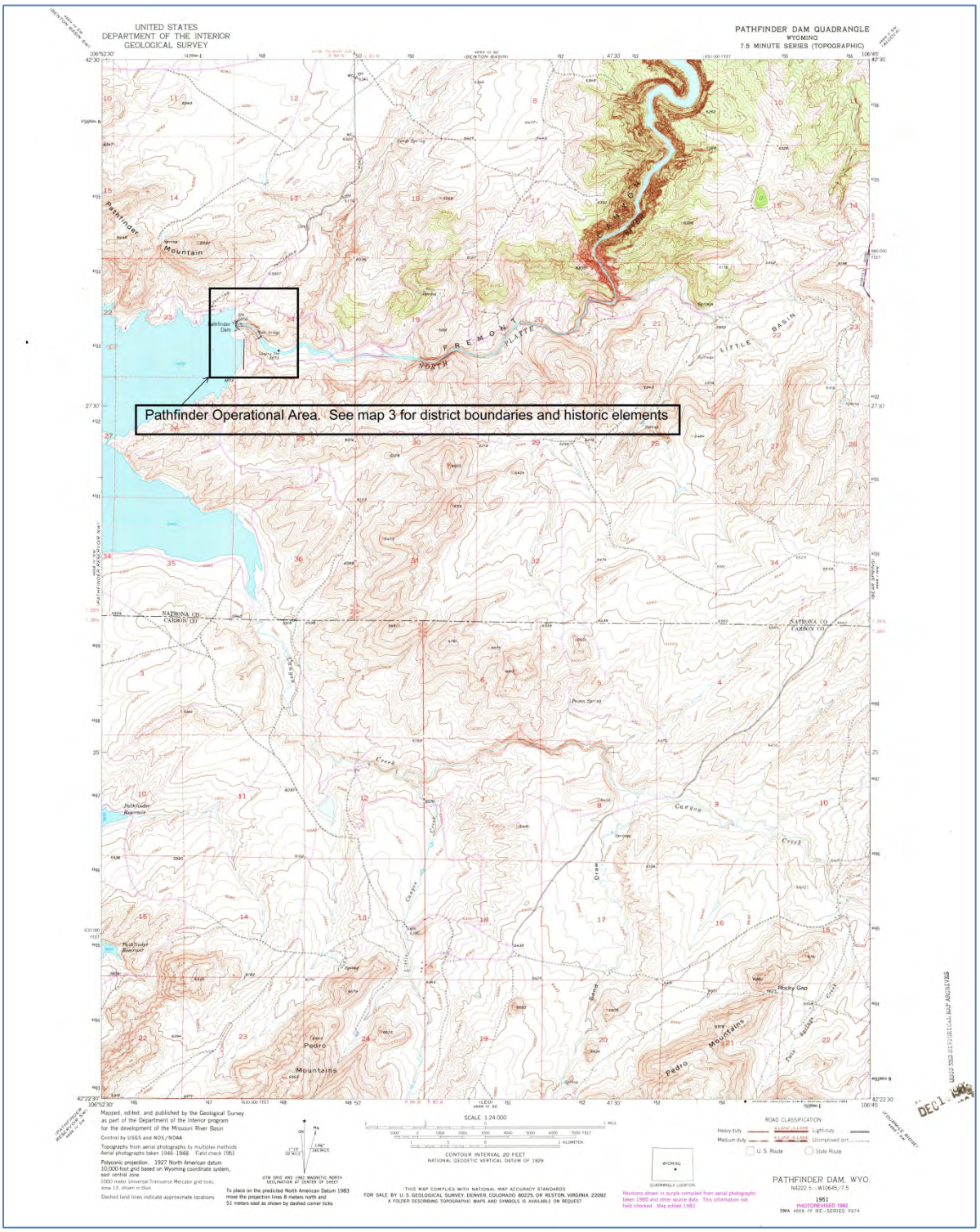
7. Description

Architectural Classification
OTHER/Arch Dam
OTHER/Utilitarian

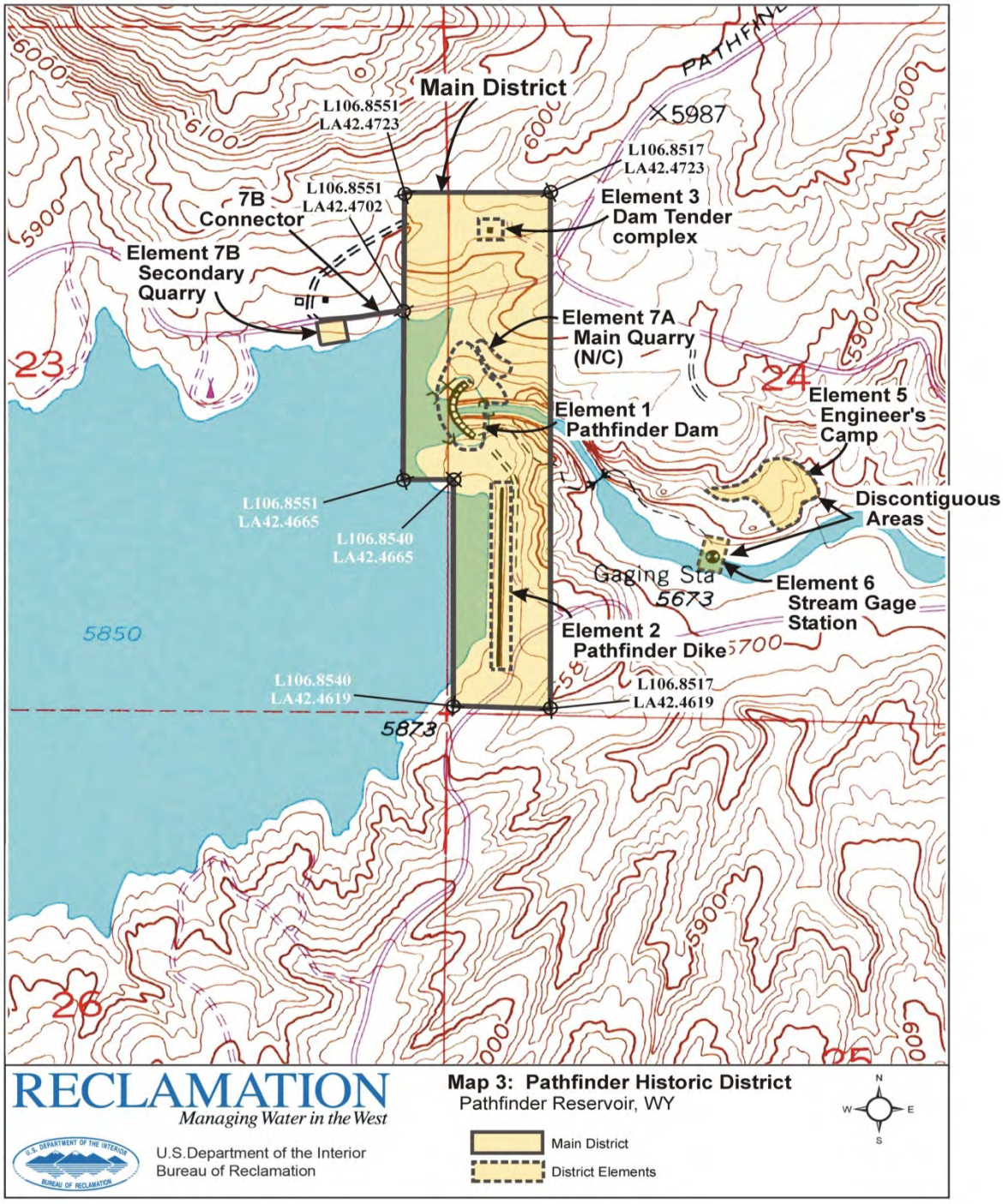
Materials:
Principal exterior materials of the property: Stone/granite; Concrete/reinforced concrete; Earth/earthfill; Wood; Metal



Map 1: State Map and Site Location



Map 2: Location Map, Pathfinder Dam Operational Area


Main District
L106.8551
LA42.4723
L106.8517
LA42.4723
L106.8551
LA42.4702
7B
Connector
Element 3
Dam Tender
complex
Element 7B
Secondary
Quarry
Element 7A
Main Quarry
(N/C)
Element 1
Pathfinder Dam
Element 5
Engineer's
Camp
Discontiguous
Areas
L106.8551
LA42.4665
L106.8540
LA42.4665
Gaging Sta
5673
Element 6
Stream Gage
Station
Element 2
Pathfinder Dike
L106.8540
LA42.4619
L106.8517
LA42.4619
5873
5850
23
24
26
RECLAMATION
Managing Water in the West
U.S.Department of the Interior
Bureau of Reclamation
Map 3: Pathfinder Historic District
Pathfinder Reservoir, WY
Main District
District Elements

Narrative Description

Summary Paragraph

Characteristics, Significant Features, and Historic Integrity

The Pathfinder Dam Historic District (PDHD, or district) is located in Natrona County, Wyoming, in a sparsely populated area dominated by public lands. Alcova, approximately 12 miles to the northeast, is the closest town, and Casper, approximately 47 miles to the northeast, is the closest city (see Map 1). The district is comprised of historic resources associated with the original construction of Pathfinder Dam and early modifications to make operational improvements. The PDHD's central feature is the dam, which was individually listed on the National Register of Historic Places at a national level of significance on August 12, 1971 (Smithsonian Number 48NA211, National Register entry number 71.8.56.0005). In 1975, the dam was designated by the state as a Wyoming Historic Civil Engineering Landmark. The dam and the contributing resources that comprise the PDHD fall into a period of significance from 1905 to 1932.

Pathfinder Dam's construction started in 1905 and was completed in June 1909. It is a cyclopean masonry arch dam with a gravity section and a natural rock spillway.[1] The dam is built of hand-hewn granite blocks facing a rock and concrete core. During the period of the dam's construction, the United States Reclamation Service (USRS, or Reclamation Service) also built the dam outlets works consisting of the spillway, a north outlet tunnel with a gatehouse, and a south outlet tunnel; a dam tender's house; and a temporary camp ("Engineer's Camp") to house USRS employees overseeing the dam's construction and likely also providing administrative offices. During this time the construction contractor built a construction plant that included three quarries, a concrete mixing plant, and two overhead cable systems, as well as a camp to house the site manager and laborers. Many of the features built by the contractor were demolished upon completion of the dam. In 1910 through to 1932, the USRS constructed the Pathfinder Dike, a second gatehouse on the north outlet works, a second outlet tunnel for the south system, a new overhead cable system (the original two and other construction plant features having been removed), and a stream gage station downstream of the dam. During this second phase of work the north and south outlet works were modified several times to resolve operational issues. These additions and alterations through 1932 are part of the early, historically important evolution of the dam's operational systems; they do not diminish the dam's historic integrity, and are features that contribute to the property's historic significance.

[1] "Cyclopean" is, in modern engineering parlance, a mass concrete placement into which large stones weighing 100 pounds or more are placed. The term has another meaning, not used here, of large stones laid without mortar, typically used by archaeologists to describe stonework constructed by ancient Mediterranean or South American societies. A "natural" rock spillway means the spillway is native bedrock, not formed of or covered with concrete or other material.

From 2010 to 2012, the Bureau of Reclamation (as the USRS was renamed in 1923) modified the upper end of the natural spillway to increase reservoir storage. While the modifications affect the materials and appearance at the uppermost end, overall the spillway still retains an overall high level of historic integrity of design, workmanship, location, setting, and association with the surrounding operational features and landscape. In the 1950s, and again in the 1990s, Reclamation again made extensive alterations to the north and the south outlet works. Most components of both outlet systems were so extensively altered by these series of modifications that they lack sufficient historic integrity or design and materials to be PDHD contributing resources. Their lack of integrity does not significantly diminish the historic integrity of the dam or other PDHD features, because most components of the outlets works are below ground or concealed within the canyon wall, and the remaining features still fully convey the property's historic significance.

Environmental Setting

Pathfinder Dam is located in the steep-walled Fremont Canyon on the North Platte River, in a remote, unpopulated area within the central Wyoming Basin. The North Platte River basin is a topographically diverse area broken by hills, terraces, mesas, mountains, and intermontane basins (see Map 2). The climate is arid, with grassland and shrubland predominating. Within the PDHD, an alternating series of ridges and drainages with a generally southwest to northeast orientation characterizes the area, penetrated by the North Platte River and the Fremont Canyon in which the dam is situated. The south slope of Pathfinder Mountain occupies the district's northern portion leading to the river. Slopes vary widely, with the canyon walls approaching 90 degrees. Dominant vegetation includes low sagebrush, prairie grass, and pinyon-juniper trees. Due to large granite outcrops throughout the area, some sections of land are largely devoid of vegetation.

Summary of PDHD Component Elements

The PDHD is comprised of six component Elements (Elements 1, 2, 3, 5, 6, and 7) with Element 7 further divided into 7A and 7B (see Map 3). There is no Element 4.[2] All Elements and their associated features are located on Reclamation land and are operated and maintained by Reclamation. Elements 1, 2, 3, and 7A and 7B are all within in an area designated as the Main District. Element 7B, a quarry, is located 1,100 feet west of the Main District, and is connected to the Main District by a road that originally served as a haul road that moved quarry stone to the dam construction site. Element 7B is included in the Main District due to its functional relationship with the dam and its connection by the haul road. Two discontiguous areas, designated Elements 5 and 6, are located approximately one-half mile to the east (downstream) of the Main District. Non-contributing features to the PDHD lie within the defined boundaries.

[2] The Elements were defined in site survey records created in the 1990s, and are used in this nomination to maintain consistency with existing records. Those records assigned the Element 4 designation to a footbridge over the North Platte River at the lower end of Fremont Canyon, downstream of the dam. A footbridge was constructed at this general location in 1907, but was rebuilt in 1934, 1981, and yet again circa 2000, and thus has no historic integrity. It is not located within the boundaries of the PDHD Main District or discontiguous areas.

They are non-contributing either because they lack historic integrity, or because they were built after the period of significance.

Element 1 includes Pathfinder Dam (already individually listed on the National Register) and 16 associated features, of which 10 are non-contributing (see Table 1 and Site Drawing 1). Element 1 is located entirely within the Main District. Contributing features associated with the dam (Feature A on Site Drawing 1) are the dam's spillway with two integral dikes and concrete training wall (Feature H) east (downstream of) the facility access walkway; the Emergency Gatehouse (Feature C), an original operational structure associated with the north outlet works; the south access ladderway (Feature G), a vertical stairway used to access the south outlet works until an elevator made it obsolete; a short rail line remnant (Feature R) that is the last visible stretch of a rail system used to transport rock from quarries to the construction-era concrete mixing plant; and the largely intact 1920 cableway system (Feature M) and cableway powerhouse (Feature N) used during rehabilitation work occurring during the period of significance.

Non-contributing features in Element 1 are: a Kimball electric elevator and stairway attached to the dam's crest and downstream face in 1949 and its associated machine house and walkway network (collectively Feature B); the Sluice Gatehouse (Feature D), which was extensively modified inside and out in the mid-1990s as part of north outlet works renovations; the north outlet works system consisting of tunnels, their integrated gates, valves, and other operational components, and connected access and operating house structures (collectively Feature E), all of which were either replaced, rebuilt, or newly built after the period of significance; the abandoned south outlet works tunnels and integrated operational components (collectively Feature F), from which most operating components were removed and the tunnels plugged with concrete in 1958; the elevated facility access walkway (Feature I) across the spillway, constructed in the 1950s and extensively rebuilt and extended during the 2010-2012 spillway modifications; the new spillway ogee weir and concrete apron located west (upstream of) the walkway (Feature J), built as part of the 2010-2012 modification; an electric deck crane (Feature L) installed in the 1970s next to the spillway training wall; and a concrete foundation (Feature O), three concrete pads (collectively Feature P), and five concrete pads (collectively Feature Q). Also situated within the boundaries of Element 1 is the Fremont Canyon Power Plant Fixed Wheel Gatehouse (Feature K), constructed in 1959-1961 as a feature of the Glendo Unit of the Pick-Sloan Missouri River Program. This gatehouse is not associated with Pathfinder facility, either historically or operationally, and so is non-contributing to the PDHD.

The presence of non-contributing features located within Element 1 does not negatively affect the historic integrity of Pathfinder Dam or the PDHD's overall historic integrity. Some of the non-contributing features are underground or hidden from view in the lower canyon walls (for example the outlet tunnels and associated features). Others are original features that simply no longer sufficiently represent their original purpose, but are not intrusive in their altered condition. Others have a purpose and appearance that is compatible with the function of the dam and its operational setting, and so they do not feel intrusive and yet also have sufficiently different appearance so as not to appear to be from the period of significance. The size and scale

of Pathfinder Dam reduces the visual intrusion of the elevator and walkway, and the addition of the elevator did not alter the dam in any meaningful way and could be removed leaving no impact on the dam's original design and materials. The modification and additions since the period of significance in no way alter the design or structure of Pathfinder Dam itself.

Element 2 consists of the Pathfinder Dike. It is a contributing structure located within the Main District.

Element 3 consists of the Dam Tender Complex, a house and barn. They are a contributing building and structure located in the Main District.

Element 5 consists of the Engineer's Camp, located in a discontiguous area one-half mile to the east of the Main District. It is a contributing site.

Element 6 consists of a stream gage station in a second discontiguous area one-half mile to the east of the Main District. It is contributing structure. The nearby (and fully reconstructed) gage cableway is not part of this contributing property, and lies outside of the boundary of the discontiguous area.

Element 7A consists of the main quarry. This is a non-contributing site located in the Main District adjacent to the spillway. It was extensively modified twice and lacks historic integrity.

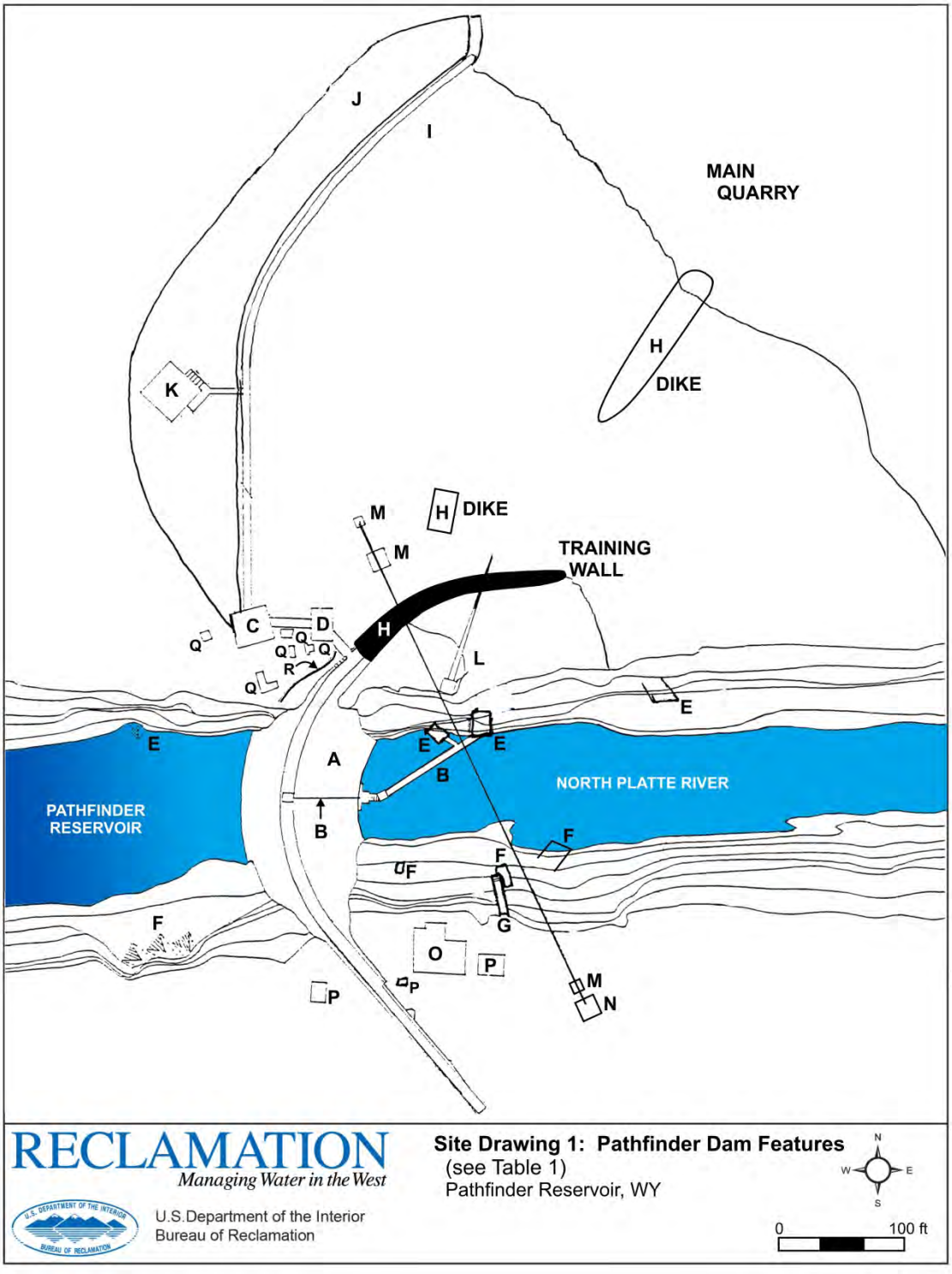
Element 7B consists of the secondary quarry 1,100 feet to the west of the Main District. The former Pathfinder haul road connects this quarry to the Main District. The quarry is a contributing site, as it has been little modified since its use during dam construction. However, the haul road is a non-contributing feature of that property, because it lacks historic integrity.

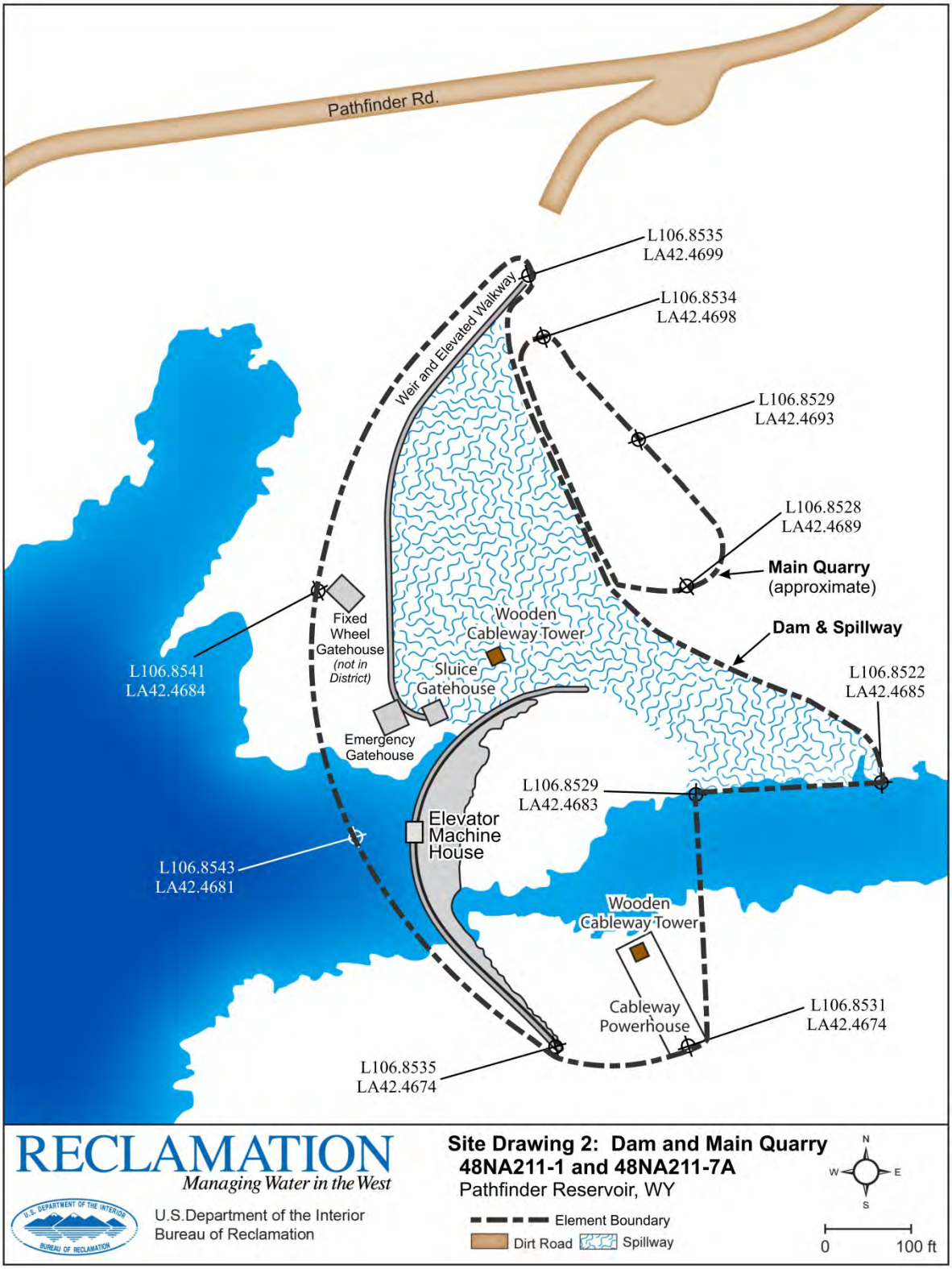
Within the PDHD are several other transportation, electrical, and communication facilities and general infrastructural features that have been maintained and upgraded since their original construction and installation to ensure safety and reliability. Such activities as the widening and improvement to roads, the replacement of deteriorated power poles, and installation of assorted electrical appurtenances have impaired their integrity and so they are non-contributing.

Narrative Description of PDHD Component Elements

Table 1: Contributing and Non-Contributing Features to Element 1 (Key to Site Drawing 1)

Map Key	Feature	Resource Type & Contributing or Non-contributing Status	Notes
A	Pathfinder Dam		Listed on National Register
B	Elevator, machine house, & stairs/walkway system to north outlet control houses	Collectively 1 Object, Non-contributing	Out of period of significance
C	Emergency Gatehouse	Structure, Contributing (exterior & period interior features & equipment)	Some non-period interior finishes, not included
D	Sluice Gatehouse	Structure, Non-contributing	Altered extensively during mid-1990s north outlet works renovation.
E	North outlet works: tunnel intake, valves, gates, tunnel system, control structure, and high-pressure (Quonset) and outlet access structures	Collectively 1 Structure, Non-contributing	Altered extensively in mid-1990s, and new features added out of period of significance
F	South outlet works, including tunnel intakes & outlet system	Collectively 1 Structure, Non-contributing	All equipment removed, tunnels plugged in1958
G	South access ladderway	Structure, Contributing	Intact feature of original south outlet. Not in use.
H	Pathfinder Dam spillway (natural section)	Structure, Contributing	Natural rock section east of facility access walkway, w/ 2 dikes and training wall
I	Facility access walkway	Structure, Non-contributing	Out of period of significance.
J	Spillway ogee weir and concrete apron	1 Structure, Non-contributing	Spillway west of walkway, built 2010-2012 (remainder of spillway is contributing Feature H)
K	Fremont Canyon Power Plant Fixed Wheel Gatehouse.	Structure, Non-contributing	Not part of Pathfinder facility; built in 1959-1961
L	Electric deck crane	Object, Non-contributing	Installed in the 1970s
M	Cableway system including towers, anchors, cables, pads, carriage, and pan bucket	Collectively 1 Structure, Contributing	1920 replacement cableway
N	Cableway powerhouse	Structure, Contributing	
O	Concrete foundation	Object, Non-contributing	Original use unknown
P	Concrete pads (3)	Collectively 1Object, Non-contributing	Original use unknown
Q	Concrete pads (5)	Collectively 1 Object, Non-contributing	Original use unknown
R	Rail system remnants	Structure, Contributing	Only known remaining section of rail system used when constructing the dam


J
I
MAIN
QUARRY
H
DIKE
K
M
H
DIKE
M
TRAINING
WALL
C
D
H
Q
Q
Q
Q
R
Q
L
E
E
E
E
A
B
NORTH PLATTE RIVER
PATHFINDER
RESERVOIR
B
F
F
F
F
G
O
P
P
P
M
N
RECLAMATION
Managing Water in the West
U.S.Department of the Interior
Bureau of Reclamation
Site Drawing 1: Pathfinder Dam Features
(see Table 1)
Pathfinder Reservoir, WY
N
W
E
S
0
100 ft


Pathfinder Rd.
L106.8535
LA42.4699
L106.8534
LA42.4698
Weir and Elevated Walkway
L106.8529
LA42.4693
L106.8528
LA42.4689
Main Quarry
(approximate)
Dam & Spillway
Fixed
Wheel
Gatehouse
(not in
District)
Wooden
Cableway Tower
Sluice
Gatehouse
L106.8541
LA42.4684
L106.8522
LA42.4685
Emergency
Gatehouse
L106.8529
LA42.4683
Elevator
Machine
House
L106.8543
LA42.4681
Wooden
Cableway Tower
Cableway
Powerhouse
L106.8531
LA42.4674
L106.8535
LA42.4674
RECLAMATION
Managing Water in the West
U.S.Department of the Interior
Bureau of Reclamation
Site Drawing 2: Dam and Main Quarry
48NA211-1 and 48NA211-7A
Pathfinder Reservoir, WY
Element Boundary
Dirt Road
Spillway
N
W
E
S
0
100 ft

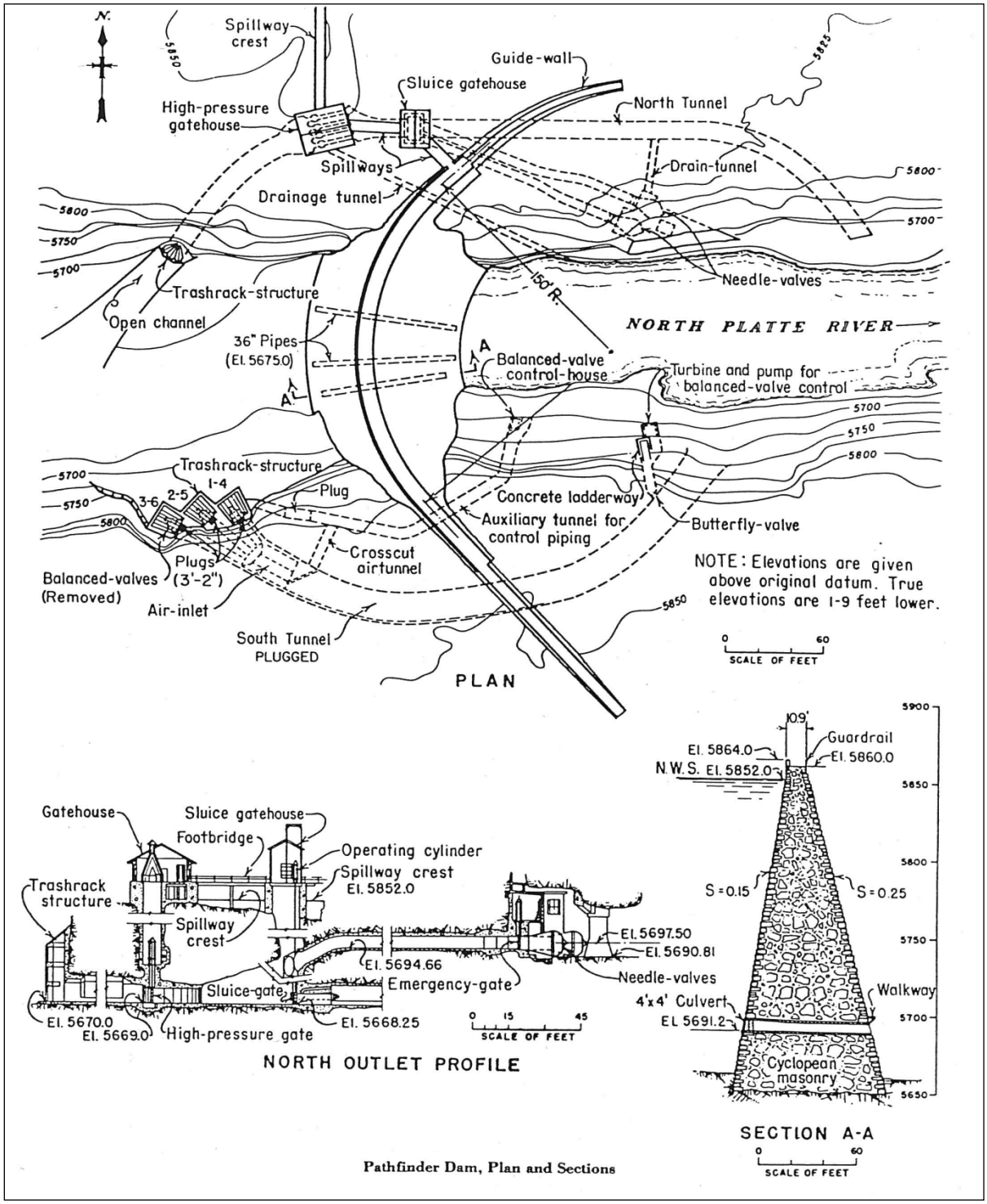
Main District: Element 1 Resources Description

Pathfinder Dam: (Feature A, listed on the National Register).[3] Designed and built by the USRS, Pathfinder Dam is the first storage dam built for the Sweetwater Project (later renamed the North Platte Project). Pathfinder Dam is located on the North Platte River 47 miles southwest of Casper, Wyoming. The dam impounds Pathfinder Reservoir, which stores irrigation water for North Platte Project lands in eastern Wyoming and western Nebraska. The dam is located in Fremont Canyon, a steep, narrow granite canyon about 3 miles below the Sweetwater River's confluence with the North Platte River, and therefore it also impounds the waters of the Sweetwater River basin. The USRS received authorization to construct Pathfinder Dam in 1903, design studies were completed in 1904, and dam construction occurred between 1905 and 1909. The dam is of particular historical significance because it is was used as the testing ground for a new design methodology devised by the Reclamation Service, the Trial Load Method. This methodology, in refined versions, established design standards essential to building high dams that could withstand extremes of water pressure and temperature variation. (See Section 8, Statement of Significance, and its supporting narrative, for more information on the Trial Load Method and its application at Pathfinder Dam.)

Pathfinder Dam is a cyclopean masonry arch dam with a gravity section, with a volume of 60,210 cubic yards of material. Built on a Precambrian granite bedrock foundation only 10 feet deep, the dam has a structural height of 214 feet, a hydraulic height of 192 feet, with a maximum base thickness of 94 feet (see Drawing 1). The crest of the dam is 10.9 feet wide and 432 feet long, and the crest elevation is 5858.1 feet, with the parapet raising the total elevation to 5864 feet.[4] The dam is arched to a constant center, the radius of curvature to the axis being 150 feet. It is faced with horizontally laid, hand-hewn granite blocks that weigh up to 10 tons, with each block set in mortar. The finely dressed blocks encase a cyclopean core consisting of granite blocks and rubble in concrete, with the volume of rock occupying 48.2 percent of the total volume of masonry. Pathfinder Dam's upper 27 feet are reinforced with steel within both up and downstream facades to prevent thermal cracking; there are no contraction joints except at a point near the south end. There is a 4-foot-high granite block parapet wall on the upstream shoulder of the dam's crest, and a galvanized pipe railing with attached chain link is mounted along the downstream crest edge. At a later date Reclamation installed barbed wire atop the pipe railing.

[3] Pathfinder Dam was listed on the National Register in 1971, and so it not counted in Section 5 among the contributing resources to the PDHD. However, since the dam is the central feature of the PDHD and association with the dam is the basis for the other features being considered contributing to that district, the dam is described here and its significance is summarized in Section 8.

[4] The current day elevation (feet above sea level) data reported for the dam differs from that originally reported, because some time after 1930 the elevational datum point was recalibrated, and the original elevational data was converted to conform to the new datum point. It also appears that some original elevation readings may have been incorrect, and were adjusted in association with the datum change. Construction period records give the elevation of the dam crest as 5860, but was revised to 5858.1 after the datum recalibration; the spillway crest was originally reported as 5850 and revised to 5850.1; the dike crest was originally reported as 5870 and revised to 5861; and the top of the core wall was originally reported as 5858 and revised to 5856.1. In June 1910 the spillway was raised 2 feet by constructing a new weir at its upstream end, and the crest of the weir is at elevation 5852.



Drawing 1: Pathfinder Dam (drawing circa 1920 as updated circa 1958). See footnote 4 for an explanation of elevation changes. (Drawing courtesy Bureau of Reclamation)

North outlet tunnel and associated operating works (Feature E, non-contributing structure). The north outlet tunnel, also known as the Pathfinder Tunnel, passes through Pathfinder Dam's north (left) abutment under both gatehouses (see Drawing 1). It was constructed in 1905-1906 to serve as the diversion tunnel used to reroute water out of the river bed and around the dam construction site, allowing the dam's foundation to be built across the river. When the dam was completed, the tunnel was converted to become the outlet tunnel used to release reservoir water into the river below the dam. At that time, the Emergency Gatehouse was constructed on the ground surface above the tunnel. The tunnel was reconstructed from 1919-1921, as part of efforts to resolve operational problems; these modifications are considered to be part of the historically important development of the dam's operational systems. The tunnel and other operations elements of the north outlet works, however, were extensively modified again in the 1980s and 1990s, and these modifications destroyed the historic integrity of the outlet tunnel and its associated works (except the Emergency Gatehouse).

The outlet works begins at a trashrack structure at the upstream end of the north tunnel, with a sill at elevation of 5670 feet (about 180 feet below the maximum reservoir water surface elevation at 5858.1 feet) (see continuation sheet 9, historic photo #16). The tunnel at this point is a 13-foot 4-inch diameter concrete lined tunnel extending 126 feet downstream to four gates located in a 25-foot 8-inch wide gate chamber. Installed at the time of original dam construction, these 3-foot 8-inch by 7-foot high-pressure gates were operated from the Emergency Gatehouse. They are now no longer in use, but left in place and are mechanically pinned in the open position. Past the high-pressure gates, the tunnel then bends and narrows to 16 feet wide at a sluice gate chamber located approximately 63 feet downstream from the high-pressure gates. This chamber originally held a 3-foot by 5-foot sluice gate that was installed as at the time of the original outlet construction. That gate was removed in 1996 and replaced by a 15-foot 10-inch by 10-foot 7 3/4-inch bulkhead gate that can close off either the Pathfinder Dam outlet works (now called the upper outlet) or the Fremont Canyon Power Conduit (called the lower outlet) constructed in the 1990s.

Also in the mid-1990s, Reclamation reconstructed the north tunnel's outlet works and control house, to be used for low flow discharges from the dam. This new outlet works consists of a 60-inch diameter steel pipe that passes through where the old sluice gate existed. This pipe extends 21 feet to a 60-inch butterfly valve, then constricts to 48-inch steel pipe that extends 114.5 feet, where it then constricts to a 36-inch steel pipe and enters a 30-inch jet-flow gate. Flows from this new outlet works are released into the north tunnel. Entrances to two parallel 6-foot-diameter concrete-lined tunnels are centered approximately 18 feet above the bottom of the old sluice gate chamber. These tunnels run for approximately 120 feet to a gate chamber where the flow in each is controlled by a 5-foot by 5-foot emergency high-pressure slide gate and a 60-inch diameter jet-flow regulating gate. In 1987, Reclamation rehabilitated the 5-foot by 5-foot high-pressure emergency slide gates and installed the jet-flow regulating gates to replace the original 58-inch needle valves. The jet-flow gates discharge into an open cut in the rock, then into the river channel. Control mechanisms for the two jet-flow gates are in the river outlet control room, built into the canyon wall at the end of these tunnels (see continuation sheet 9, current photo #10-11). Originally constructed in 1921, the control room was substantially modified in appearance

and function, with operating equipment replaced, during the 1990s renovations that replaced the gate systems operated from that room.

On the canyon floor's north side near the dam's toe stands a poured concrete, Quonset-roofed tunnel access structure, constructed after the period of significance. It is built at the access point to a 5-foot-high tunnel that leads from the canyon floor up to the high-pressure gates in the gate chamber of the north tunnel beneath the Emergency Gatehouse. Reclamation built the structure to provide protection from rock falling from the canyon walls above the tunnel access. It is reached via the walkway leading from the elevator down the dam's face.

All of the north outlet works elements described are indicated as a single, non-contributing structure in the Section 5 count of district properties.

Emergency Gatehouse (Feature C, contributing structure), built in 1909, originally called the High-pressure Gatehouse. Utilitarian in design with little ornamentation, it measures 25 feet by 25 feet, has a poured concrete foundation, with walls constructed of dressed granite stones gleaned from rock left in one of the adjacent quarries from which much larger granite blocks were quarried to build the dam (see continuation sheet 9, current photos #2, 5, 6, 8, and 13). The stones laid in horizontal courses and are set in mortar. It has a wood shake-shingle hipped roof supported by 2 by 8-inch wood trusses. The gatehouse retains its original two 2-over-2 wood sash windows (now sealed shut) with wire mesh screens, and a steel door (not original). The interior walls of the gatehouse were originally unfinished, but have had sheet-rock-type overlay added in recent years. The ceiling is a corrugated material that also is of recent origin. The floor is painted concrete.

The Emergency Gatehouse was built to house controls used to operate high-pressure gates once used to shut off the flow of water through the north outlet tunnel. The gates are located in a gate chamber situated in the north tunnel approximately 174 feet below the gatehouse (see Drawing 1 "North Outlet Profile"). The gate stems extend from the gatehouse down to the gate chamber by way of a vertical shaft through the granite bedrock, accessed via an oval opening in the gatehouse's concrete floor. For safety reasons the shaft is encircled by a pipe hand railing to which, at some later date, a chain-link mesh has been attached. The shaft also provides human access to the gates below via a rebar step ladder installed on the side of the shaft. In 1998, Reclamation pinned the high-pressure gates in the open position, making the gates and their controls inoperative, but leaving them intact. The controls still remaining in the gatehouse include operating valves and an oil tank/reservoir, which once fed oil for gate operation.

Several features have been installed within the Emergency Gatehouse that are not from the period of significance. These are an electrical control panel for electric lights and receptacles in both gatehouses, and a stilling well and a calibrated Selsyn Wheel and float device used to take readings of reservoir elevation levels. These features do not significantly alter the original appearance and historic character of the gatehouse interior. They, and the recent interior wall sheathing and ceiling enhancements, are not contributing components of the gatehouse.

Sluice Gatehouse (Feature D, non-contributing structure), sometimes called the Bulkhead Gatehouse. It measures 13 feet by 25 feet, is built of poured reinforced concrete, has a newly installed corrugated metal gabled roof that is painted green, two steel doors (one sealed shut), and one window opening covered with metal shutters (see continuation sheet 9, current photos #2, 9, and13). The structure was built in 1921 as part of the modifications to the north outlet system operating works, and then extensively altered during the late-1990s north outlet works rehabilitation. The 1990s alterations to the gatehouse fundamentally altered its character-defining features, including removal of the steel roof-top superstructure used to operate the original tunnel sluice gate system (this superstructure is visible in Drawing 1, "North Outlet Profile"). All original sluice gate operating mechanisms were also removed from the gatehouse interior at that time.

South outlet works (Feature F, non-contributing structure). In 1910-1911, the Reclamation Service constructed a second outlet tunnel in the dam's south (right) abutment (see Drawing 1). It consists of a 360-foot-long tunnel, partially lined with concrete, fed from three intake structures that were controlled using six 58-inch Ensign-type balanced needle valves. The upper end of the tunnel where the valves were housed is 40 feet wide and 30 feet high, but it narrows to become 15 feet wide by 14 feet high for much of its length. The tunnel's outlet is at the south canyon wall below the dam, and releases at the outlet were controlled by a Butterfly valve operated from a small valve house. Within 2 years of operation, the USRS found that high pressure releases were damaging the south tunnel's floor. To counter this, a smaller auxiliary tunnel was constructed, extending from the valves at the south tunnel inlet to discharge into the canyon upstream of the original tunnel outlet. The discharge was controlled by a balanced-valve in a small control house at the end of the auxiliary tunnel (see continuation sheet 9, historic photos #19 and 22). The south outlet system was taken out of use when the Fremont Canyon Power Conduit was constructed in 1958. At that time Reclamation plugged the tunnels with concrete bulkheads and removed the valves and all other equipment. Due to lack of integrity, the south outlet system is considered non-contributing to the PDHD, and is counted as one non-contributing structure in Section 5.

South Access Ladderway (Feature G, contributing structure). On the south side of the river, an access ladderway enclosed within a concrete structure clings to the near-vertical canyon wall face. Built circa 1912, it once provided access to the south tunnel outlet valve control house and the auxiliary tunnel's balanced valve control house (see continuation sheet 9, current photos #2-4 and 45, historic photo #22). The ladderway is situated immediately upstream of the south tunnel outlet, and about 60 feet downstream of the balanced valve control house. The concrete structure protected those using the ladder from falling rock and other hazards, while the ladder inside is site-built of bent rebar. It went largely out of use after an electric elevator was installed down the face of the dam, and is no longer in use due to safety concerns.

Pathfinder Spillway (Feature H, contributing structure), **Facility Access Walkway** (Feature I, non-contributing structure), and **New Ogee Weir and Apron** (Feature J, non-contributing structure) (see Site Drawing 1). Flood releases from Pathfinder Reservoir occur by way of an uncontrolled spillway at the dam's north (left) abutment. As originally built, water that rose

above the reservoir's maximum elevation of 5850.1 feet flowed over a weir and into a flat shallow channel in the canyon's granite wall, then traveled around the dam's abutment to empty high on the canyon to fall to the river below the dam. The lower end of the channel is a largely natural formation, while the upper end was created by granite quarrying activities to build the dam. When the dam was completed, the USRS dressed the native rock to form an overflow (ogee) weir at the upper end of the channel, cleaned up rubble and outcrops in the quarry and natural channel, and built three structures in the spillway to help control direction of water flows. Two of those structures are small granite-rock and concrete dikes, and the third is a poured concrete training wall along the spillway's southern edge to guide water away from the dam's north abutment (see Site Drawing 1, and continuation sheet 9, current photos #15-16 and 31, and historic photo #17). Much of the original natural spillway, including the dikes and training wall, remain largely unaltered (as shown in current photo #16), but significant modifications have occurred at the spillway's upper end.

In the late 1950s, Reclamation built an elevated walkway across the spillway near the upper end to allow access to the dam and gatehouses from the spillway's north side as it was carrying water. In 2010-2012, the natural rock crest of the spillway was replaced by a poured concrete S-shaped concrete ogee weir 2.4 feet higher than the original rock crest, from elevation 5850.1 to 5852.5, which allows the reservoir to store water to that higher elevation (see continuation sheet 9, current photo #6-7 and 15). A concrete apron extends from the new ogee weir down to the location of the elevated walkway. The walkway was extended and modified at this time (see continuation sheet 9, current photo #32).

Below (or east) of the access walkway, the spillway remains unchanged, and continues to operate as originally designed. For this reason, the spillway retains sufficient integrity of design, materials, workmanship, feeling, and setting to convey the resource's historic character. The walkway and the concrete upper section of the spillway do not, however, contribute to the historic structure because they were not built during the period of significance. The new weir and concrete apron section of the spillway is counted in Section 5 as one non-contributing structure, while the remainder of the spillway is counted as one contributing structure.

Cableway system (Feature M) and **Cableway Powerhouse** (Feature N) (2 contributing structures). (See continuation sheet 9, current photos #1, 9, 13, 16, 17, 19, 20, 47, and 48.) Located in Element 1 on the canyon rim just downstream of the dam is a 439-foot-long overhead cableway system. The cableway was built in 1920 to replace an earlier, no longer safe, cableway system constructed in 1905. The 1920 cableway was used to lower materials into the canyon or across the canyon during the installation of water control valves and gates during the dam's post-construction outlet improvement projects. Key structural features of the cableway are two wood-lattice, derrick-style towers connected by an overhead cable system from which a bucket, platform, or other items could be attached; a pan bucket still hangs from the cableway. One tower stands on each side of the canyon. They are made from creosote-soaked Oregon fir. The head (south) tower stands 31-feet 9-inches tall, while the tail (north) tower stands 40 feet tall, and each is mounted on and secured to concrete leveling footings. Each tower is also secured to the

ground on the side opposite the canyon (so opposite the load-bearing overhead cable) by anchor cables connected to anchor mechanisms mounted deep within a concrete pad located 40 to 50 feet from the tower. The mechanism to convey loads across the canyon is a system of 21/4-inch plow steel cables mounted on a carriage assembly affixed to the towers. A steam boiler located in the cableway powerhouse powered the cableway system. The powerhouse, a wood-framed, shed-roofed structure with corrugated sheet-metal cladding, still stands just south of the head tower, and elements of the boiler system remains inside the structure. It, like the cableway system, is no longer operational.

This new cableway system replaced an older, unsafe cableway system left in place to use after the completion of dam construction. This safety issue came to light several years earlier, on February 9, 1912, when one of the "crow's foot" anchor cables for the tower near the south access ladderway snapped under duress while transporting a load of concrete across the canyon. The loose cable whipped about, hitting five men who were working on the ladderway, sending them 160 feet to their deaths in Fremont Canyon. These were the only casualties reported at Pathfinder worksite. World War I-related funding shortages delayed replacement of the old cableway until 1920. Possibly as a result of the accident, the USRS built the new cableway using a more secure—and safer—anchor mechanism than the "crow's foot" type anchor system used for the older cableway. [5] (See continuation sheet 9, current photo #47, for a close-up of the upgraded tower anchoring mechanism.)

Rail System Remnants (Feature R, contributing structure). A contemporaneous dam construction period site drawing shows the routes of rail lines used to transport granite from the quarries to a mixing plant located near the Emergency Gatehouse. Feature R is an approximately 8-foot-long remnant of one of those lines, located just upstream of the dam's south (right) abutment (see Site Drawing 1). The location indicated this was the rail system terminus. It consists of rails laid directly on the bedrock and gravels (see continuation sheet 9, current photo #50). It is visible today from the dam crest when water levels are low. Other rail remnants are visible next to it, they are partially covered in sediment and rock deposited by the reservoir over the last century. While only a short fragment of the original line remains, it is considered contributing because it is the sole feature remaining that represents an important infrastructural component of the dam construction plant.

Electric Deck Crane (Feature L, non-contributing object). Next to the spillway training wall is a 1950s-era LeTourneau RD-25 electric deck crane, permanently mounted in place and painted to blend in with the spillway's native rock (see continuation sheet 9, current photos #1 and 15). Rated at 10,800 pounds, it is used to raise and lower loads to the canyon floor. It is operated from a remote control station located at the center of the dam crest next to the elevator

[5] There is an unresolved discrepancy in the historic record. While an official Reclamation Service accident report written on February 14 (and published in the *North Platte Project History 1902-13*) titled "Accident of February 9, 1912" claimed the men were killed by the snapped anchor cable, the *Denver Post*, on February 10 (as quoted in Autobee 1996, p.19) reported the men were killed while riding the cableway back to camp at the end of the work day, and plummeted to their deaths when the cable snapped under duress.

control structure. Records indicate it was moved to Pathfinder Dam from another unknown site in the late 1970s.

Kimball Electric Elevator (Feature B, non-contributing object). In the late 1940s, Reclamation installed this electric elevator on Pathfinder Dam's downstream face to provide safe and easier access to the water outlet control rooms located on the canyon floor. The elevator, a 4 by 4-foot metal cage built by Kimball Elevator Company of Denver, runs on a metal track attached to the dam face. It is powered by electricity generated inside a small, concrete-block machine house that stands on the dam crest (see continuation sheet 9, current photos #1-3, 12, and 14). A safety ladder attached to the track allows egress in the event of elevator failure. At the bottom of the elevator track, a ladder and wood plank walkway across the riverbed leads to the high-pressure gate access structure and the river outlet works control room on the canyon floor. Sometime after 1960, this ground-level walkway system replaced a catwalk attached to the dam and canyon faces.

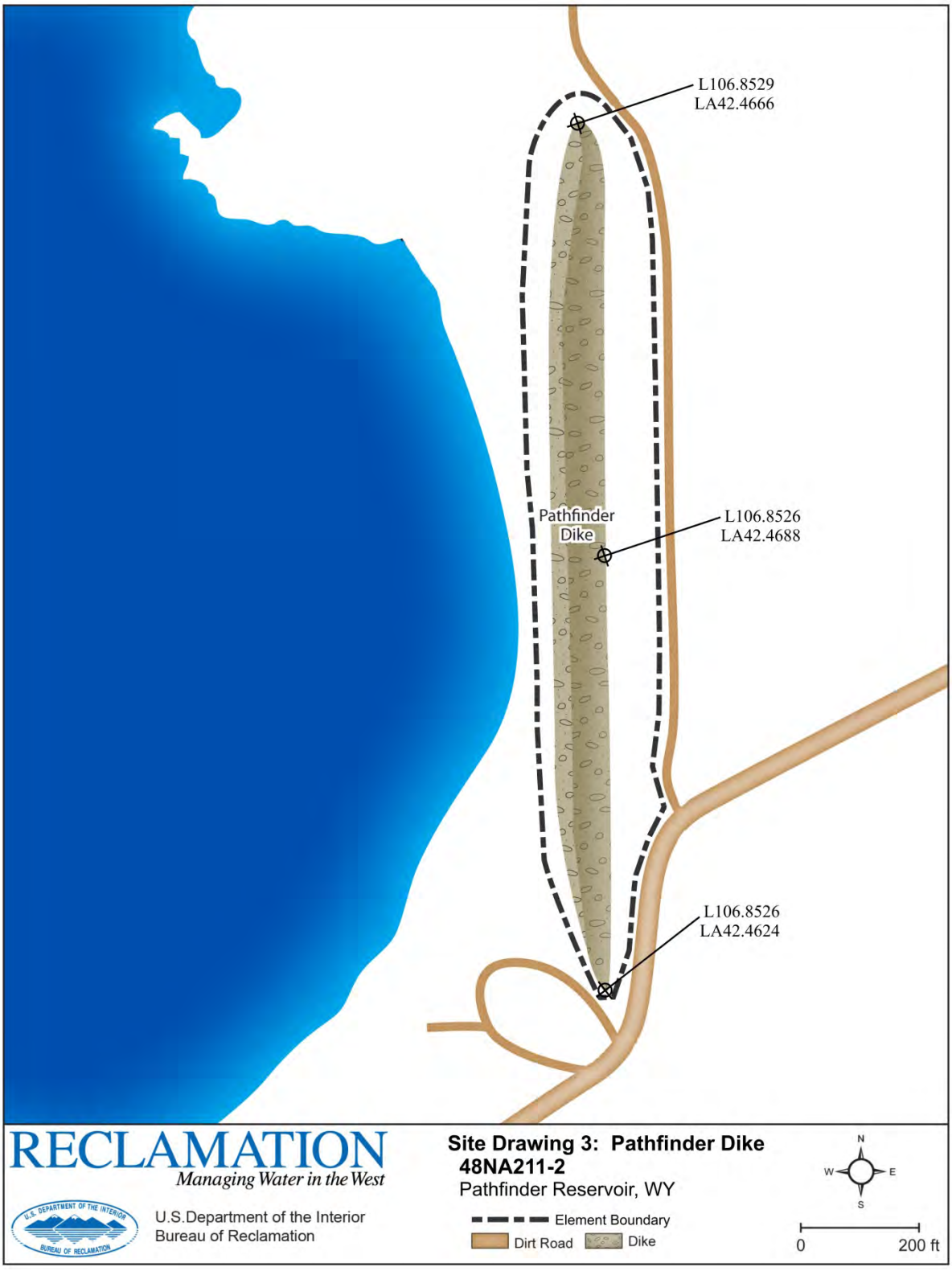
Fremont Canyon Power Plant Fixed Wheel Gatehouse (Feature K, non-contributing). From 1958-1960 Reclamation constructed the Fremont Canyon Power Plant conduit as part of the Glendo Unit, Pick-Sloan Missouri River Program. The conduit transports water stored in Pathfinder Reservoir, via buried pressure conduit, to the Fremont Canyon Power Plant located approximately 3 miles downstream of Pathfinder at the head of Alcova Reservoir. This tall, monolithic concrete structure holds the operating equipment for the gates controlling water flow into the power conduit. It is not historically or operationally associated with Pathfinder Dam.

Miscellaneous Objects (Features O, P, Q, all non-contributing): The Main District and Element 1 area retain scattered groupings of miscellaneous objects that represent the historic construction processes, but there may not be records that can clearly define their purpose. These include, on the south side of the river, a concrete slab foundation (Feature O, see continuation sheet 9, current photo #18) and three concrete pads (collectively Feature P). Five concrete pads are visible on the north side of the river upstream of the dam (collectively Feature Q). Feature O is likely the foundation for the large building visible in a 1940's photograph (see continuation sheet 9, historic photo #22). It was built sometime after 1909 (there are no buildings at this location in construction-era photographs), and it is no longer present by the 1960s (see historic photo #23). It is thought the Feature P pads were associated with the south towers of the two cableway systems built at the site in 1905 and demolished by 1920. Historic photos indicate the contractor's plant was located in the area of Feature Q pads during dam construction (see continuation sheet 9, historic photo #14). In addition to these concrete foundations, there are numerous iron U-bolts and what appear to be anchor pitons permanently set into the exposed granite rock of the spillway. Historic photos suggest these bolts and pitons may have been used as guy wire anchors to support small gaffs and cranes during the dam's construction. There are numerous similar remnants on the south side of the canyon. Although these features are of interest, they are too contextually incomplete to convey purpose, so at this time they are not considered contributing. Some or all might be later found to be contributing, if more detailed information is found in historical documents as to their purpose and importance.

Main District: Element 2, Pathfinder Dike (48NA211-2) (contributing structure)

Completed in 1911, Pathfinder Dike is located about 750 feet due south of the dam's south (right) abutment. It was built to block off a 20-foot-deep low area between the reservoir basin to the southeast and the river canyon. The dike prevents the reservoir water from spilling through this low area, enabling water to be stored to a higher elevation. It is a dual-zoned earthfill embankment with a concrete core wall (see continuation sheet 9, current photos #21-22). The dike has a structural height of 38 feet and a hydraulic height of 20 feet, is 1,650 feet long with a crest elevation at 5868.1 feet, with top width of 20 feet and a base width of 210 feet, with a material volume of approximately 152,000 cubic yards. The concrete core wall is keyed into the dike foundation and runs the length of the dike. The top of the core wall is at elevation 5856.1 feet. The upstream face of the dike has a 3:1 slope and is protected from wave action by a facing of 18-inch hand hewn and placed granite slabs (see continuation sheet 9, historic photo #20). The downstream face of the dike has a 2:1 slope, and other than grass has no protective facing.

Dike embankment Zone 1 is the dike's interior material, while Zone 2 is the dike's downstream outer layer. Zone 1 consists of selected gravel, sand, silt and clay materials (classified soil groups SP-SM, SW-SM, and SM), which were previously described as "earthy materials." Zone 2 is the downstream shell classified as "soil materials." The reinforced concrete core wall is located within the Zone 1 material, approximately 15 feet upstream of the embankment's centerline, and runs the dike's length. The dike contains an internal drain system consisting of an 8-inch diameter open-joint tile drain placed in a cutoff trench below the earthen material/foundation contact point about 15 feet downstream of, and parallel to, the dike's centerline. No modifications have been made to Pathfinder Dike. It exhibits high integrity of setting, location, workmanship, materials, feeling, and association with the surrounding landscape.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Pathfinder
Dike
L106.8526
LA42.4688
L106.8526
LA42.4624
RECLAMATION
Managing Water in the West
U.S.Department of the Interior
Bureau of Reclamation
Site Drawing 3: Pathfinder Dike
48NA211-2
Pathfinder Reservoir, WY
Element Boundary
Dirt Road
Dike
N
W
E
S
0
200 ft

Main District: Element 3, Dam Tender Complex (48NA211-3) (house and barn, counted as one contributing building and one contributing structure).

About one-quarter mile northeast of Pathfinder Dam is the dam tender complex, which consists of a small house and barn. Located on the north side of the river, it is set on a grassy, south-sloping site, with the house's front (south-facing) elevation oriented to overlook the river canyon and dam. The house sits in a small yard with mature trees and grass lawn surrounded by a post and cable fence. The associated barn sits about 100 feet to the east of the house. Since the late 1970s, the dam tender's house has served as the Pathfinder Interpretive Center, and the barn, which was once used to house stock and tack, is currently used for storage.

Built in 1906 to house the dam tender, the house is a vernacular single-story rectangular-plan, granite block building with a side-gabled roof. It sits on a granite stone foundation that forms the cellar walls (see continuation sheet 9, current photos #23 and #26-28, and historic photo #21). A chimney constructed of square-cut granite blocks extends above the roof ridge. A shed-roofed porch extends part way across the house's south (front) elevation. Simple in design, the dam tender house is devoid of any decorative treatments. The most notable feature is the granite walls, made of the same stone used for the dam, which give the house a feeling of solidity and permanence. A high quality of craftsmanship is exhibited in this masonry work, with the finely cut and finished stone is laid in irregular courses. Stones used in the corners are square-cut and generally larger, with joints finely tooled into a concave pattern. The gabled and shed roofs are covered with sawn wood shingles. A metal ridge trim with ball details at both gable ends finishes the roof. Roof eaves overhang on all sides and the soffits are finished with narrow tongue and groove boards.

The house has two entrances, with the primary entrance off-center in the south elevation and is associated with the shed roof porch. It is supported by three square concrete posts tapered at their base, and sit on a concrete floor set on a stone foundation. Two simple metal pipes create a railing between the posts. The porch is enclosed on the west end by a vertical board wood wall. A secondary entrance is centered in the east end elevation, under a wood shingled shed roof porch hood supported by decorative iron grilles. There are 11 ground floor windows. They are vertical two-over-two wood sash, to which aluminum storms and metal security bars have been added at a later time. Window sills are concrete, lintels are stone. There is a smaller rectangular window in each gable end at the attic level, with the east gable window a one over one wood sash, while the west window is divided vertically into two panes. There are two three-pane cellar windows set in window wells located at the building's southeast corner.

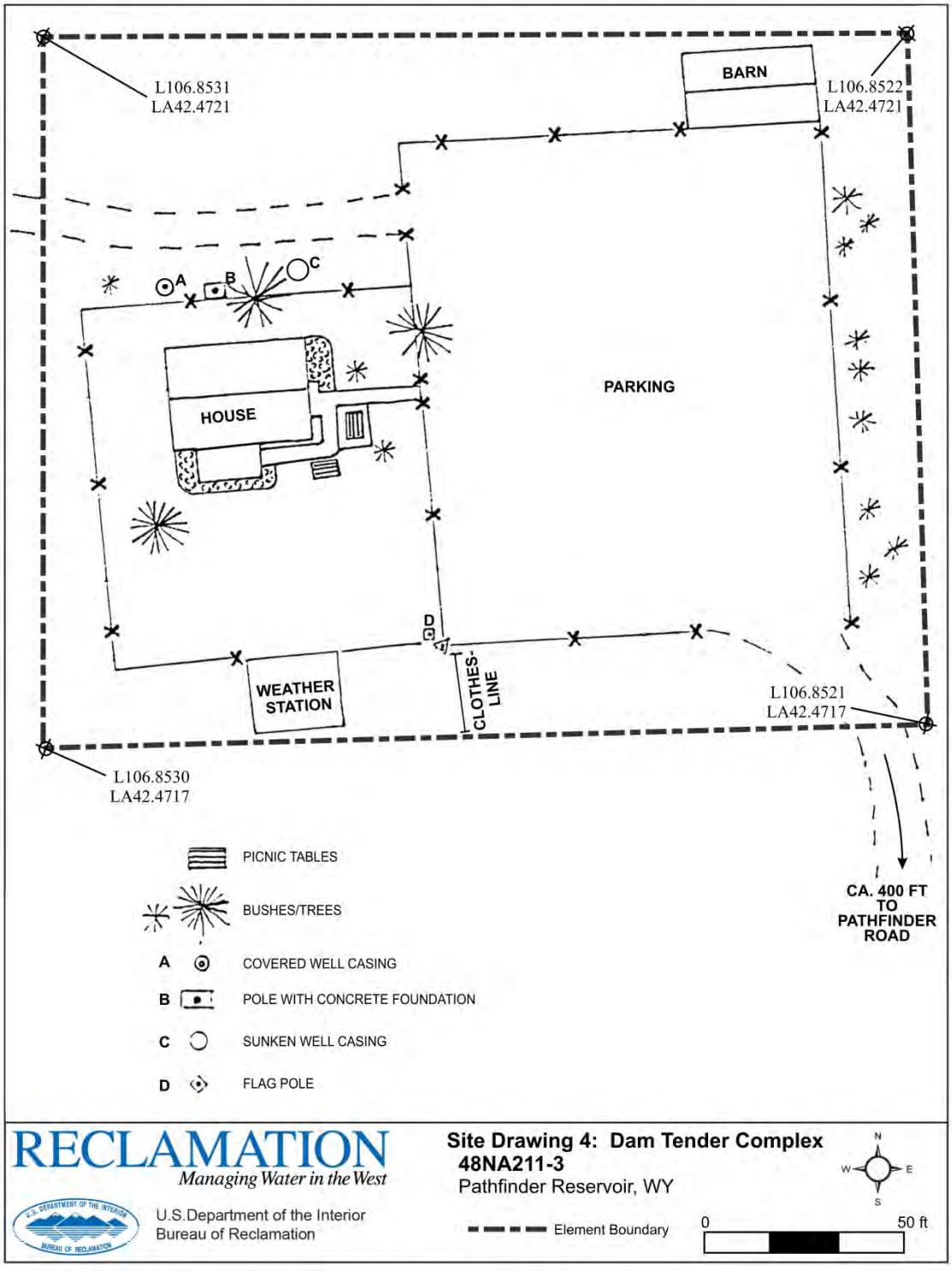
Interior spaces consist of the main floor, partially finished attic, and cellar. There are five rooms on the ground floor. The attic is divided into two spaces; the east end is finished, the west end is not. The kitchen and bath have been remodeled and they no longer exhibit original finishes. The other main-floor rooms have smooth plastered walls and ceilings, wood floors with baseboard trim and simple 1-inch by 4-inch wood trim around the doors. Doors vary in design. The cellar is located at the building's east end, accessed by an interior staircase. Its walls are exposed

mortared granite coated with white paint, the floor is dirt, and there are two three-pane windows. Stairwell walls at ground level are white-painted plaster.

Reclamation has modified the house over the last century. The porch has been partially enclosed, the kitchen and bath have been remodeled, and some minor modifications have occurred to convert the interior for use as an interpretive center and museum.

The dam tender's barn, built in 1910, is located about 100 feet east of the house. It is a simple two story rectangular plan structure with a side-gabled roof (see continuation sheet 9, current photos #23-26). It is set into the slope of the hill so that the lower level is wholly below the ground surface on the uphill (north) side. The barn's lower level utilizes the same granite block construction as the house, while the upper level is frame with wood drop siding and corner boards. The sawn wood shingle roof has overhanging eaves and the same ridge detail as the house. There are three entrances. The lower level of the barn is accessed at the center of the barn's south elevation through a pair of large swinging barn-style doors, flanked on either side by a square fixed window. The window east of the door is divided into six panes, that west of the door window into four. Above the double doors is a six over six double hung window that lights the upper level of the barn. On the north elevation, there are two entrances into what is the barn's second level, but due to the slope the doors enter at ground level. One door is a pair of swinging doors, the other is a sliding door hung from a metal rack. The center of the east and west elevations each contains a six over six double hung window. The west end also contains a square four-paned window in the lower level. The lower level interior, which once housed stock, has a wood floor and the granite walls are finished with concrete. Four square wood posts provide support for the beams for the upper floor. The upper level has wood flooring and walls finished with wood boards. The ceiling is open to the rafters. It was, and still is, used for the storage of maintenance and other equipment.

Also within the boundaries of the dam tender complex, but not contributing to the historic significance of the property, is a graveled parking area extending from immediately east of the house to the barn, and a weather station on the south of the lawn. These were installed out of the period of significance. The access road to the house most likely follows the route of the original access road, but has been rebuilt to an extent that it no longer retains its original character and so is not included within the boundary of Element 3. Also outside the boundary, about 100 feet east of the barn, are the foundational remnants of a much later dam tender house torn down in recent years due to asbestos contamination. These non-contributing features do not detract from the feeling or historic integrity of the dam tender complex as they are visually unobtrusive and their construction did not alter the design, materials, or character of the house and barn or their setting. The Pathfinder dam tender complex retains a high level of historic integrity in location, design, setting, materials, workmanship, feeling, and association with the surrounding landscape.


L106.8531
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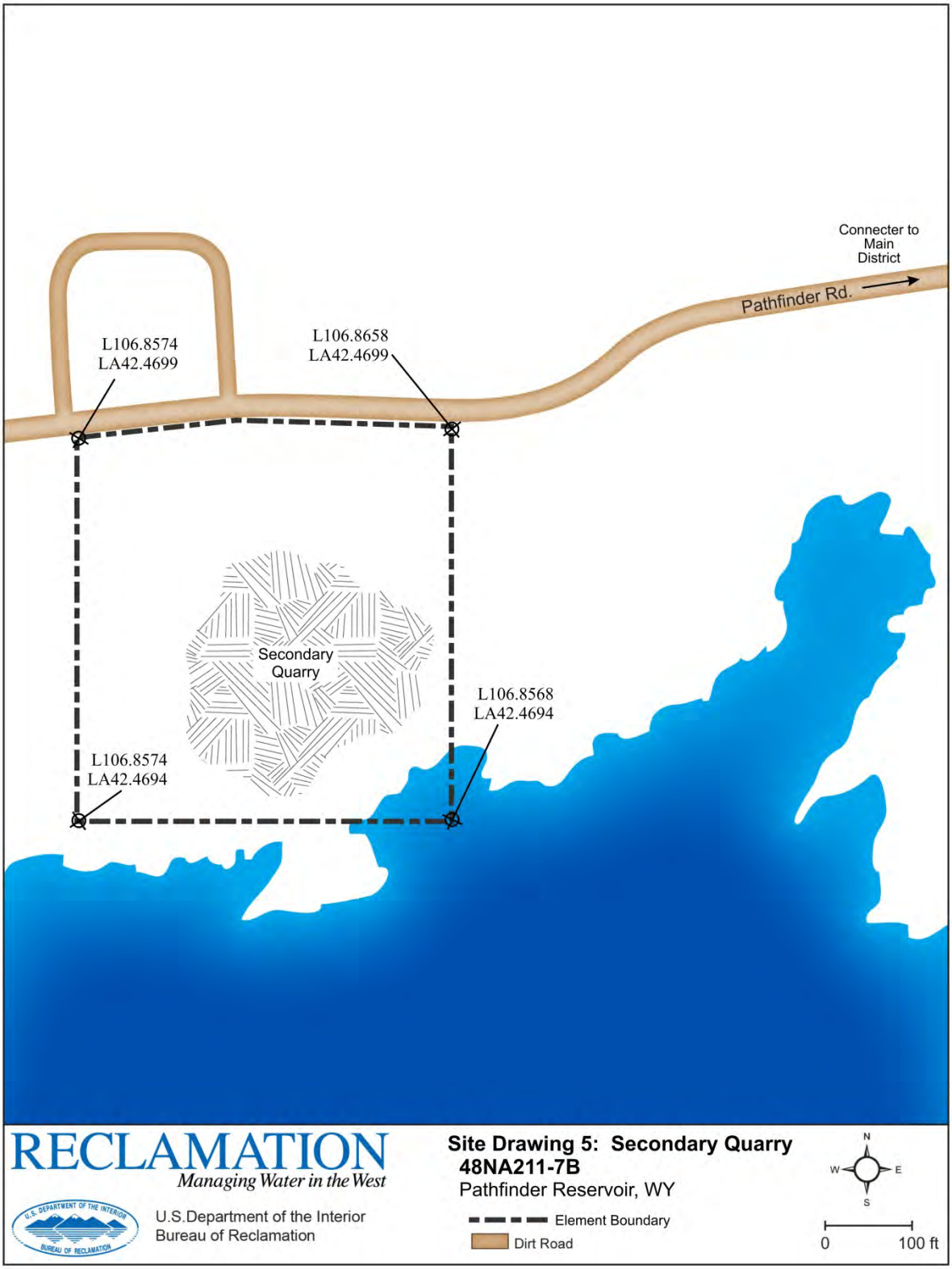
BARN
L106.8522
LA42.4721
A
B
C
HOUSE
PARKING
D
WEATHER STATION
CLOTHES-LINE
L106.8521
LA42.4717
L106.8530
LA42.4717
CA. 400 FT TO PATHFINDER ROAD
PICNIC TABLES
BUSHES/TREES
A COVERED WELL CASING
B POLE WITH CONCRETE FOUNDATION
C SUNKEN WELL CASING
D FLAG POLE
RECLAMATION
Managing Water in the West
U.S.Department of the Interior
Bureau of Reclamation
Site Drawing 4: Dam Tender Complex
48NA211-3
Pathfinder Reservoir, WY
Element Boundary
0
50 ft
N
W
E
S

Main District: Element 7A, Pathfinder Main Quarry (non-contributing site) and Element 7B, Secondary Quarry (contributing site) (48NA211-7A and -7B)

Three quarries provided the stone to build Pathfinder Dam, dike, the Emergency Gatehouse, and the dam tender house and barn. The tertiary quarry is permanently inundated by the reservoir, and is not discussed further. The main quarry (Element 7A, see Site Drawing 2) was located at the dam's north abutment in the area now part of the upper end of the spillway. The secondary, or west, quarry (Element 7B) is located about 1,100 feet west-northwest of the spillway's upstream end (see Map 3).

The **main quarry** provided stone that engineers determined was of lesser quality than the rock from the other two quarries, and so it was used as rock for the cyclopean masonry that forms the dam's core. Today, very little remains of the main quarry. It was first altered in 1909 to create the spillway. At that time, particularly uneven areas were somewhat leveled to create the spillway floor and loose rock was removed. It was further altered in 2010-2012, during the spillway rehabilitation project. Today, only the northern-most edge of the quarry remains, forming the north side of the spillway (see continuation sheet 9, current photo #31). Because so little of this quarry remains, it lacks historic integrity and is non-contributing to the Pathfinder Dam Historic District.

The **secondary quarry**, with the tertiary quarry, were the principal source points for the high-quality granite used for the blocks for the dam's upstream and downstream facades. A haul road extended from the secondary quarry to the dam work site. Furthermore, historic documents have noted that a hand-powered rail system was used to move stone from these quarries to the work site. Numerous iron bolts and anchors set into the ground and rocks of the quarry site may have been used to stabilize the small gaffs and cranes used to move blocks onto the rail system. Today, the secondary quarry remains relatively unaltered (see continuation sheet 9, current photos #29-30). It retains sufficient integrity to convey its purpose and structure, and is the sole quarry remaining that can illustrate this essential component in the Pathfinder Dam construction processes. Therefore, it is contributing to the Pathfinder Dam Historic District. The quarry is part of the main district, connected by the former haul road (see Map 3 and Site Drawing 5). The road was reconstructed in the 1960s to serve as part of the access road to reservoir recreation areas, and the design characteristics were so altered to meet modern standards that it no longer conveys its historic design or character. Therefore, the haul road is not part of the contributing property.


Connecter to Main District
Pathfinder Rd.
L106.8574
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L106.8658
LA42.4699
Secondary Quarry
L106.8568
LA42.4694
L106.8574
LA42.4694
RECLAMATION
Managing Water in the West
U.S.Department of the Interior
Bureau of Reclamation
Site Drawing 5: Secondary Quarry
48NA211-7B
Pathfinder Reservoir, WY
Element Boundary
Dirt Road
N
W
E
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100 ft

Pathfinder Dam Historic District Discontiguous Areas (see locations on Map 3)

Element 5: Pathfinder Engineer's Camp (48NA211-5) (discontiguous contributing site)

Approximately one-half mile downstream of the dam, on hilly bluff north of and overlooking the river, is the site of the dam construction camp, called the Engineer's (or Government) Camp. It was established in 1905 to house Reclamation Service engineers and administration staff involved in the dam's construction, and subsequent improvement projects, during the period of significance. Here, they and their wives and families "lived respectably in frame houses."[6] The Engineer's Camp was abandoned circa 1920, with the end of the reconstruction of the outlet works. It may have been reduced in size after completion of the dam in 1909. The lack of structural debris would seem to indicate that the frame superstructures were moved to other locations when the camp closed. Today it exists as a largely undeveloped historic interpretive site, with benches and small interpretive signs where principal concentrations of features exist.

The Engineer's Camp site was documented as part of archeological surveys conducted in 1979 and 1993 (see Table 2 for a list and brief description of Engineer's Camp features, as recorded in 1993). These surveys identified twelve stone and mortar or poured concrete foundations, located in three groupings (see Site Drawing 6). The principal grouping, located on a bench above the river at the southeast end of the site, consists of concrete six foundations laid out in two parallel rows, oriented toward the street formed by the rows, with a standing concrete structure associated with one foundation (Features B through H in Table 2; see continuation sheet 9, current photos #36-40). A second grouping of three stone and mortar foundations lie to the west, across a swale (Features I through K; see continuation sheet 9, photo #42). Three similar foundations are found along the river bank further to the west. The foundations in the two secondary groupings are more crudely formed and their distribution lacks the uniformity of the principal grouping. A cistern (Feature A; see continuation sheet 9, current photo #41) is located north of the building foundations. A shallow ditch is visible extending between the cistern and a concrete foundation (Feature P) near the river bank that may have once been the footing for a pump that lifted water to the cistern. The standing structure (Feature B) is small, rectangular, shed roofed building, with the walls, roof, and floor all of poured concrete. There is a single entrance, a doorway opening in the north wall that appears to have opened into the interior of a building now evidenced only by its foundation (Feature C, see current photo #38), and so it is likely this structure was a secondary feature off another building. The structure also has a small window opening centered in the south elevation, facing the river (see current photo #40). The purpose of the structure is unknown, but it was common for Reclamation Service construction camps to have a concrete storeroom or vault attached to the construction engineer's office to hold payroll and materials that needed to be secured. Some hypothesize it may have served as a jail, but historic records indicate only once was a person arrested at the construction site.

[6] Autobee 1996. As was typical at Reclamation Service construction sites, the government built a camp to house their staff (this is Engineer's Camp), and the construction contractor built a separate camp to house their employees and laborers. It appears that at the Pathfinder dam site, laborers and their families as well as unauthorized "camp followers" lived in other nearby locations in "dugouts, tents, and shanties in the gullies."

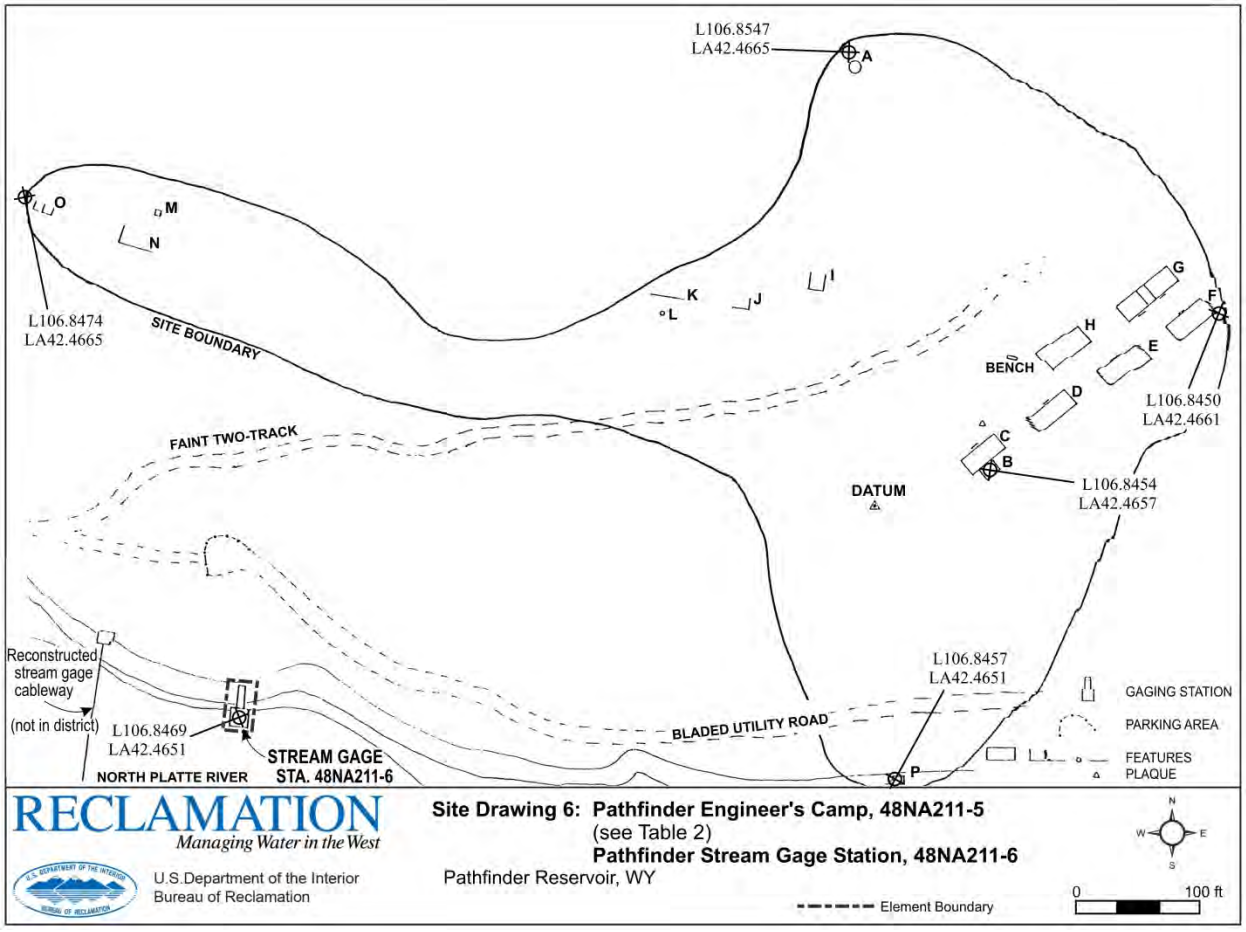
Table 2: Pathfinder Dam Historic District Engineer's Camp, Legend to Site Drawing 6 [7]

Camp Feature	Feature Name	Location (Approximate)	Brief Descriptor
A	Cistern	North edge of saddle	Open sub-surface cistern, 2.4m diameter, stone walls plastered with cement, 1.5 inch iron pipes leading in and out
B	Concrete structure	Adjoins foundation of Feature C	2.2m wide, 3.1m long, front wall 2.43m tall, rear wall 2.28m tall; walls are about walls are 8-10cm thick poured concrete. Concrete shed roof with vent holes. Doorway in NW wall with step leading up; appears entry to this structure was through Feature C. A window with reinforced sections faces southwest.
C	Poured concrete foundation	Adjacent to Feature B	11.5m by 4.8m wide and 20-30cm tall. Six concrete footings run the center length; part of floor support structure. Feature B is centered and physically adjoins the southwest side.
D	Poured concrete foundation	Immediately north of Feature C	11.5m by 4.8m wide and 20-30cm tall. Six concrete footings run the center length, a concrete step centered on the NW wall.
E	Poured concrete foundation	Immediately north of Feature D	11.5m by 4.8m wide and 20-30cm tall. No footings. 1.5-inch diameter metal pipe vertically protruding in interior west corner, concrete step centered on the northwest wall
F	Poured concrete foundation	Immediately north of Feature E	Same as D, except four concrete footings run the center length.
G	Poured concrete foundation	Immediately west of Feature F	Two sections totaling 17m by 4.8m and 20-30cm tall; 4.1m by 2.3m and 1.6m deep subsurface room centered in the feature. Both sections contain 4 concrete footings running the length of the center. Concrete step centered on SE side of the SW section of the feature.
H	Poured concrete foundation	Immediately west of Features D and E	11.5m by 4.8m wide and 20-30cm tall. Six concrete footings run the center length.
I	Mortared stone foundation	30m west of Feature H	7.4m by 4.4m, with 3 large stone block footings.
J	Leveled area with stone foundation	15m west of Feature I	Crudely built laid stone foundation, 8.5m wide by 9.4m long
K	Stone foundation	Immediately west of Feature J	Crudely built laid stone foundation, 7.8m wide by 10.1m long
L	Unknown		Shown on map, but not explained in text

[7] Table 2 data from Pronghorn Archeological Services, *Class III Cultural Resource Inventory of the Pathfinder Dam Operations Area, Natrona County, Wyoming, 1993*. Report prepared for the Wyoming-Nebraska Area Office, Bureau of Reclamation. Original metric measurements retained for this table only.

Table 2: Pathfinder Dam Historic District Engineer's Camp, continued

M	Concrete Structure	On western end of camp	Cube-shaped structure partially excavated into the hill roughly 1x1x1m in size, with an oven-like opening on the south side; metal grill set into the concrete in the center; elbow-shaped pipe extends from the top.
N	Mortared Stone Foundation	On western end of camp	Measures 9.2m by 8.7m, with northwest portion partially buried; concrete step attached to south wall
O	Laid Stone Foundation	On western end of camp	Measures 3m by 7m
P	Concrete Foundation	Far south end of camp adjoining North Platte River	3m by 1.8m; may have been the foundation of a pump house that provided water to the cistern (Feature A). Remnants of a conveyance (ditch or buried pipeline) leads from the cistern across the site to Feature P



Although the Engineer's Camp is reduced to foundations, the site still conveys a strong sense of location, setting, feeling, and association. These foundations clearly illustrate the camp's layout. If future records research fails to yield maps, photographs, or documents that describe the camp and its features, the remaining site structural elements still provide important information about the organization and construction of one of Reclamation's first construction camps. The site represents an essential activity associated with the dam construction process, meeting the requirement to house staff and provide administrative space in a remote and inhospitable location. For these reasons, the Engineer's Camp is a contributing site within the Pathfinder Dam Historic District.

Element 6: Pathfinder Stream Gage Station (48NA211-6) (discontiguous contributing structure).

Located about one-half mile downstream from Pathfinder Dam is a stream gage station built in 1932 (see Map 3).[8] Until 1932, gaging measurements were taken by hand at a location about 100 feet upstream of the gage station by a person ferried out over the river in a carriage suspended from a cableway system. After the gage station was built, the cable system was left in place and continued to be used on occasion to take readings to calibrate the Stevens recorder inside the station. The original cableway system was entirely rebuilt in 2000 due to age deterioration and safety concerns. Additionally, the Stevens recorder in the gage station provided more reliable readings than those taken by hand from the cable system.

The gage structure consists of a concrete stilling well, on top of which is mounted a 5-foot by 7-foot, wood-framed, wood shingled hipped roof instrument house, with a Stevens "E"-type water level recorder installed inside (see continuation sheet 9, current photos #34-35, and 49). There is one fixed four-pane window on the south elevation facing the river, and a steel door on the north elevation. A concrete walkway, supported by a concrete pier with steel safety railings, provides access to the structure.

The station has not been modified since construction, and retains a high level of integrity of materials, workmanship, feeling, location, and setting within the surrounding riverine landscape. The gaging function is an integral feature of Pathfinder Dam's operational scheme; the gage station represents that operational function. For these reasons, it is a contributing feature to the historic district. The reconstructed gaging cableway, however, has lost its historic integrity. For this reason, the Element 6 boundary does not encompass the cableway, and is not included in the district resource count.

[8] Gaging measures the river flow velocity, to establish an accurate "gaging curve" of discharges from the dam. Originally it was measured below Pathfinder Dam to ensure sufficient flow was released to meet downstream water requirements. Today it is measured to ensure that sufficient water is released to meet the 75 cfs "low flow" standard to maintain the fishery habitat below the dam.

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.
- [X] 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
(Enter categories from instructions.)
ENGINEERING
AGRICULTURE

Period of Significance
1905-1932

Significant Dates
1905: Diversion tunnel and Engineer's Camp constructed
1909: Pathfinder Dam completed; post-construction rehabilitation begins
1910: Dam tender complex completed
1911: Pathfinder Dike completed
1921: Pathfinder Dam post-construction rehabilitation completed
1932: Stream gage station completed

Significant Person
(Complete only if Criterion B is marked above.)
N/A

Cultural Affiliation
N/A

Architect/Builder
U.S. Reclamation Service/Bureau of Reclamation
Geddes and Seerie Stone Company, Denver (contractor to build dam)

Statement of Significance Summary Paragraph

The Pathfinder Dam Historic District is eligible for the National Register of Historic Places under Criterion A at the statewide level of significance, due to its association with the settlement, development and maturation of irrigated agriculture in eastern Wyoming and western Nebraska.

The Pathfinder Dam Historic District is also eligible under Criterion C at the national level of significance, due to the important role that Pathfinder Dam played in the testing and refinement of a new dam design methodology, often called the Trial Load Method. Pathfinder Dam was also a testing ground where the Reclamation Service developed construction practices to enhance efficiencies and reduce costs.

Construction on the dam began in 1905, with construction of the diversion tunnel. By 1909, the dam, spillway, north outlet tunnel and associated gatehouse and the initial south outlet tunnel were completed, as well as a house for the dam tender. In 1910, the Pathfinder Dike was completed to close off a low area on the reservoir's rim, south of the dam, and a barn was built at the dam tender's house. By this date, it was becoming clear that the outlet tunnels were suffering from cavitation and were not working properly. A series of modifications were made from 1911 to 1921 to address these problems. Throughout this time, the Engineer's Camp, built in 1905, remained in use to house the men overseeing the construction and outlet rehabilitation work. In

1920, a new cableway was built to use for on-going work. In 1932, a stream gage station was built to allow more accurate measurement. The district's period of significance from 1905 to 1932 reflects this period of occupation, initial construction, completion, and post-construction rehabilitation and betterment of the dam and its associated operational features.

Narrative Statement of Significance

Criterion A: The Pathfinder Dam Historic District is associated with the early 20th century settlement and development of previously vacant arid lands, and the maturation of agricultural economies, in eastern Wyoming and western Nebraska. Settlement of the North Platte Valley in western Nebraska began in the early 1880s. However, rainfall was scarce when needed, and could not support agriculture. Small private concerns built irrigation systems along the rivers, but they lacked the know-how and resources to construct dams and storage reservoirs. Without facilities to hold the early spring runoff, the river could not supply sufficient water during the growing season and farms would fail. Passed in 1902, the Reclamation Act enabled the Federal government to build western irrigation projects. The U.S. Reclamation Service was established in 1902 to implement that work. In 1903 the new bureau received approval to study and develop its initial five irrigation projects. The North Platte Project (original called the Sweetwater Project) was one of those original five projects. The Reclamation Service immediately began surveys to determine the location of irrigable lands. As the work proceeded, it became apparent that storage must be provided to allow any considerable area to be irrigated. In 1904, the Reclamation Service selected the Pathfinder Dam location for the first North Platte Project storage dam, making it the linchpin that allowed the irrigation development of eastern Wyoming and western Nebraska. In 1927, a second storage dam, Guernsey Dam, was completed to serve the North Platte Project.[9] Today the Project serves lands extending 111 miles along the North Platte River Valley, from Guernsey, Wyoming, to Bridgeport, Nebraska. Water from Pathfinder and Guernsey dams provide full service irrigation for about 226,000 acres divided into four irrigation districts in two states. Supplemental irrigation service is furnished to eight water-user associations serving a combined additional area of about 109,000 acres.

Criterion C: Pathfinder Dam, the key element of the Pathfinder Dam Historic District, was individually listed on the National Register of Historic Places on August 12, 1971. It was listed at a national level of significance under criterion C for its major engineering contributions to high masonry/concrete arch dam design and construction, and as a showcase for its meticulous hand-built craftsmanship. Pathfinder Dam served as a field laboratory to test a new dam design methodology, called the Trial Load (or Trial Load Twist) Method of analysis, a methodology developed by the Reclamation Service and Consulting Engineer George Y. Wisner. In 1903, Wisner presented a paper in which he theorized that, to store sufficient volumes of water to meet the bureau's mission to irrigate arid lands, the Reclamation Service would have to build dams of great height. Wisner, a proponent of arch dams for cost efficiency and strength, emphasized it

[9] Guernsey Dam is a National Historic Landmark.

was imperative that high masonry arch dams be designed using accurate site-specific data to allow correct determination of temperature and waterload stresses the dam would experience. He defined study methods to collect data and calculate stresses to design arch dams that would be built in narrow canyons —where the arch action of the dam could be taken into account. Pathfinder Dam became the laboratory for testing Wisner's theoretical methodology. He, with consulting engineer Edgar T. Wheeler, collected data at the Pathfinder dam site in early 1905 and applied that data to analyze potential load stresses on a masonry arch dam at that location. As a result of his calculations, the USRS designed Pathfinder as a combination of an arch and a vertical cantilever fixed at the base, and was the first dam designed using this then-revolutionary methodology. The Reclamation Service began to immediately apply what was learned when designing Pathfinder Dam to other dams; in fact, they reviewed the existing design for the Salt River Project's Theodore Roosevelt Dam and modified that dam's design to include steel reinforcements to reduce thermal cracking. This method of analysis was thereafter applied during the design of all the bureau's high arch dams.

The Trial Load Method revolutionized the design process for high masonry or concrete arch dams. After it was first tested at Pathfinder Dam, engineers in Reclamation and elsewhere continued to refine the method to allow consideration of a greater array of variables. For several decades, Pathfinder Dam remained the baseline against which refinements of the method were tested by Reclamation and other engineers around the world. The Trial Load Method of analysis remains in use today, in a refined form. The concepts that Wisner presented have now long been standard design assumptions. Pathfinder Dam, therefore, holds a lasting and highly significant place in the definition and evolution of scientific methods used in the modern civil engineering profession.

Pathfinder Dam is the district's focal feature. All other contributing properties are significant because of their association with the construction, early rehabilitation, and operation of the dam. They help convey the dam's early history and the required resources and processes for its construction. Of particular interest is the 1920 overhead cableway system. It appears to be the most intact remaining example of an early cableway system at a Reclamation damsite.

Developmental History/Additional Historic Context Information [10]

Water is inextricably linked to growth and development in the western United States. Much of the region (primarily the portion of the Great Plains west of the 100th Meridian, the southwestern deserts of California and Arizona, and the Great Basin area of Nevada, Utah, and Idaho) is made up of desert or semiarid land. For this reason, the region remained sparsely settled during the first half of the nineteenth century. Then gold discoveries in California, Colorado, Idaho, and South Dakota brought waves of gold seekers later in the century. Most failed to find riches and returned home empty handed, but some stayed. Furthermore, the gold rushes turned the attention of other easterners toward the west with the idea of permanent settlement of the area.

[10] Developmental history and additional historic context information from Robert Autobee, *North Platte Project History*. Denver: Bureau of Reclamation History Program, 1996.

In the nineteenth century social theorists and philosophers became proponents of western expansion to further an idealized vision of an agrarian society built around the family farm. Thomas Jefferson had written that independent farmers were the backbone of American society; the small family farm assumed an almost mythical importance in American culture. This agrarian mythology dovetailed with the concept of *Manifest Destiny*, the belief that the United States had a divinely-ordained mission to control and populate the frontier and spread American ideals and culture. The Homestead Act of 1862, which would provide applicants 160 acres of public land if they settled upon the land, built a home, and farmed, was an expression of these dual ideologies. However, this agrarian mythology was often at odds with the realities of the arid west. Settlers soon found that water (or the lack thereof) would be a determining factor in their ultimate success or failure. It was clear that, for settlement to occur in much of the arid west, irrigation would be needed.

An early proponent of arid lands reclamation was John Wesley Powell, the Civil War soldier, explorer, geologist, and writer who became the second director of the U.S. Geological Survey (USGS), the Federal agency charged with mapping and documenting the American landscape. From 1867 to 1872, Powell led a series of expeditions along several major western rivers, including the Colorado River where he made the first documented river passage through the Grand Canyon. During the 1870s, the USGS made numerous studies of drainages, aquifers, and other water sources; these efforts increased in 1881 when Powell became head of the agency. Powell also wrote a series of monographs expounding upon the need for irrigation if the potential of the arid west was to be realized. During this period the term *reclamation* came into use to describe the concept that irrigation could "reclaim" the arid west for the use of settlers and farmers.

By the 1880s, westerners promoting western economic development began to ask for the Federal government to provide financial support for irrigation development of the west. Experience had shown that the great cost of constructing and maintaining storage reservoirs and canal systems was often beyond the capability of private enterprise or settler's cooperatives. These boosters pointed to federally funded river and harbor improvements in the eastern United States as precedent for Federal economic support for western land reclamation. Many boosters claimed a Federal reclamation effort would benefit the entire country, not just the far west.

Support for Federal involvement in land reclamation grew within Congress, as new western states with an irrigation interest were admitted to the Union. Washington, North and South Dakota, and Montana were admitted as states in1889, Wyoming and Idaho in 1890, and Utah in 1896. The emergence of the Progressive Movement in the 1890s, with its philosophy of modernity and scientific progress, and its belief that the Federal government should be more actively involved in supporting and regulating the economy for the greater good, was another factor lending support for Federal involvement in irrigation development. In 1894, in response to these pressures, Congress passed the Carey Act, which offered a million acres of Federal land to any western state that would foster the irrigation of that land. However, Congress didn't provide funding to the states to aid in developing those lands; construction of

improvements was left to the recipient state or private enterprise. Most early Carey Act reclamation projects failed due to lack of funds and technical expertise. Additionally, a prolonged drought that began in 1889 caused many western farms to fail from lack of water.

By 1900, Congress was under intense pressure to develop comprehensive Federal irrigation policies. Then, in 1901, Vice President Theodore Roosevelt assumed the Presidency after the assassination of President William McKinley. A champion of Progressive ideals, and knowledgeable of the arid conditions of the west (Roosevelt had for a time been a rancher in North Dakota), he embraced the need for land reclamation backed by the Federal government. As President, he worked closely with congressional allies to write and pass the Reclamation Act in June 1902.

The Reclamation Act directed the Secretary of the Interior (Secretary) to implement a program to "study, locate, and construct irrigation works…for the storage, diversion, and development of waters for the reclamation of arid and semiarid lands" in the West, and to maintain those works. The Secretary created the U. S. Reclamation Service as a division of the USGS to accomplish those tasks. The Act authorized Federal irrigation development in 16 western states and territories, which was soon expanded to 17 states. The Act set aside funds from public land sales to use for studies leading to, and for the construction and maintenance of, irrigation projects.

The fledgling Reclamation Service embarked on an ambitious program of planning and construction. In 1903, the Secretary authorized the five initial reclamation projects: the Truckee-Carson Project (Nevada), Milk River Project (Montana), Sweetwater (later renamed North Platte) Project (Wyoming and Nebraska), Gunnison Project (Colorado), and the Salt River Project (Arizona). The USRS also conducted surveys and evaluations in 17 western states; between 1903 and 1907 the bureau began 24 separate survey and construction projects. Much of this work was carried out by newly-minted engineers and scientists graduating in increasing numbers from American universities and colleges.

The Reclamation Service immediately began studies for the Sweetwater/North Platte Project, initially focusing upon the Sweetwater River basin. However investigations soon refocused on the North Platte River, after Wyoming State Hydrographer A. J. Parshall suggested they investigate a particularly good potential dam site in a canyon 3 miles downstream of the North Platte/Sweetwater confluence. The North Platte flows in an easterly direction through Wyoming and on into Nebraska. In an average year, the drainage basin can provide approximately 1.4 million acre-feet of water[11] runoff from an area of approximately 12,000 square miles of land. Therefore, acting upon Parshall's advice, in August 1903 the Reclamation Service dispatched a crew to conduct geologic tests to assess the location's suitability as a dam site. The narrow v-shape of the canyon, and the solid granite rock that formed the canyon floor, was determined to be a nearly ideal location for a high arch dam capable of storing the huge volume of flow (see continuation sheet 9, historic photo #2). The new dam would

[11] An acre-foot is defined as the amount of water needed to inundate one acre of land one foot deep.

be named *Pathfinder* to honor John C. Fremont, "The Pathfinder of the West," who had explored the area in the 1840s.

Once the site was selected, USRS began work to design the dam. They had already determined the dam would be built of granite quarried from the immediate area of the dam. This decision was determined by cost; the dam's remote location, 47 miles southwest of the nearest freight depot at Casper, meant that all construction materials would have to be transported from Casper via mule train and horse-drawn wagon to the work site (see continuation sheet 9, historic photo #1). On average, it would cost $2.68 to have a barrel of cement freighted to Casper, plus another $3.00 to transport it to the site. Building the dam using the excellent granite at the dam site would reduce the amount of cement needed and thereby reducing hauling costs. Ultimately, three quarries would be established at the site.

But before construction could begin, the dam would first have to be designed. Coincident with the start of the Pathfinder Dam's design process, a Reclamation Service consulting engineer, George Y. Wisner, wrote an article and presented a paper to USRS design engineers about factors to be taken into consideration when designing a high arch (particularly a masonry arch) dam.[12] Wisner challenged generally accepted dam design assumptions about the stress loading and reactions of foundation and dam materials, and showed that they cannot be generalized from site to site. He asserted that stresses and reactions are highly specific to the site conditions, such as the foundation material, uniformity of material, and the shape of the canyon, that designing dams according to standard assumptions can result in dams that act very differently than anticipated, potentially unsafely. He particularly challenged the common assumption that mass equaled stability, and noted that overly massive dams were inefficient (used more material than necessary) and were therefore unnecessarily costly. Wisner spoke to the "…necessity of having a thorough investigation made to determine the stresses which will be developed in high masonry dams by changes of temperature and the combination of masonry and steel reinforcement requisite for absolute safety of such structures with minimum cost of construction."

In 1905, the USRS approved Wisner and fellow civil engineer Edgar. T. Wheeler to test a methodology (which would come to be called the Trial Load Method) at the Pathfinder dam site, then apply the results to that dam's design. Wheeler started his field investigations in January 1905. Their subsequent report of investigations stated the Pathfinder dam site study "indicates clearly the nature and the location of these stresses which must be provided in short masonry dams of the arch type, and also that economical construction consistent with safety requires independent design for every structure having different dimensions, or constructed of materials having different strength, weight and coefficient of expansion and elasticity… Any attempt to generalize designs for such structures is almost certain to be of no value except for conditions identical to those on which these designs were based, and any theoretical determinations of

[12]Information concerning Wisner's studies and quoted conclusions are from George Y. Wisner and Edgar T. Wheeler, "Investigations of Stresses in High Masonry Dams of Short Spans." In *Engineering News*, Volume LIV No. 6, August 10, 1905, 141-144.

stresses and pressures based upon assumed conditions can not be otherwise than worthless until modified so as to conform to the conditions and materials in the structure where applied."

Wheeler applied the data collected at the Pathfinder site provide a preliminary design to the Reclamation Service for an arch design with a batter of 0.35 of the height, 10 feet thick at the crest, with an upstream radius of 160 feet. It would have no massive gravity section, as modeling indicated this wasn't needed for the dam to safely withstand the compression (water pressure on the dam's face) and temperature stresses that would be experienced at the dam site. Before forwarding this recommendation Wheeler has also analyzed a dam design with a downstream batter of 0.45 and upstream batter of 0.35, and "found it would be safe, but that distribution of stresses from pressure were better with the batter of the faces nearly equal." Wisner commented recommended preliminary design "gave a width of structure such that the end sheer at any horizontal section was less than one-tenth the safe compression load for masonry to be used; or, in other words, the dam would be safe under arch action alone, without taking into consider the weight of the structure." The outcome of the Pathfinder dam site tests supported Wisner's opening assertion that more mass did not always equate to greater safety, but always resulted in greater cost to construct.

The Reclamation Service assembled a Board of Consulting Engineers to review the preliminary design. The Board revised the design, taking a somewhat more conservative approach. They altered the upstream and downstream batters and crest radius, thereby creating a gravity section at the arch's base. Wheeler and Wisner then analyzed this revised design using their stress load model. They found that, when analyzed as a gravity dam, loading was less than ideal (the line of pressure for the portion of the load carried by the foundation would fall outside of the base of the dam), but when the arch action of the design was considered it had the stability to handle the water pressure of the reservoir in all conditions (i.e., at full pool or lower). The revised design did create stresses when temperatures were 10 degrees below normal, but they would occur in a portion of the dam's vertical profile where Wisner and Wheeler felt the stresses would be transferred to the canyon walls. They also analyzed the "worst case scenario" for temperature, which would occur at low water with a temperature that was 15 degrees above normal at the top of the dam and normal below the water line. This allowed analysis of temperature stress loading, indicating where reinforcement would be needed to avoid horizontal temperature stress cracking in the downstream face.

As a result, Wisner and Wheeler recommended that reinforced steel be installed in the upper section of the dam's upstream and downstream faces to avert stress cracking. They also recommend that thermophones be placed in the canyon sidewalls and in the dam masonry, and reading be taken frequently to collect data on thermal action. The Reclamation Service applied these recommendations to the Pathfinder Dam design. They also took action to review the already-completed designs for the Salt River Project's Theodore Roosevelt Dam, which was in the initial construction stages, and for Shoshone Dam, a concrete arch dam in the design phase. Reinforced steel was added these dams in sections subject to temperature stress cracking. The Trial Load Method was used for design analysis for all Reclamation's arch dams in the decades that followed, including such significant structures as Arrowrock, Hoover, Owyhee, Shasta,

Hungry Horse, and Glen Canyon dams.

While the dam was still in design phase, the USRS proceeded with preliminary site preparation work. In late 1904, they awarded a contract to the Kilpatrick Brothers and Collins Contracting Company of Beatrice, Nebraska, to construct a river diversion tunnel around the dam work site. This tunnel, on the north side of the river, would later be converted to a permanent outlet for the reservoir (the north outlet tunnel). By August 1905, the 480-foot tunnel was completed. In September 1905, with the dam's design now finalized, the USRS signed a contract with Geddes and Seerie Stone Company of Denver, Colorado. Geddes and Seerie won the bid after two prior failed efforts, including the first contractor withdrawing after seeing the dam site for the first time and realizing they had significantly under estimated the cost of working at such a remote location and difficult site. Geddes and Seerie offered a bid of $482,000 to construct the dam, spillway, and outlets, and to construct the plant necessary for the work (concrete mixing plant, cableways, etc.) and a camp to house their staff and laborers. The company, founded in 1885 by Irish immigrant William F. Geddes and Scottish immigrant David Duff Seerie, worked on many projects in the Denver area. Among their accomplishments was the construction of Cheesman Dam near Denver, and several notable buildings including the Colorado State Capitol and Denver's Brown Palace Hotel. The USRS was responsible for improving the existing rough road from Casper to the dam site and for building a camp to house their own staff.

By the end of September 1905, USRS crews had improved the road. Teamsters would use this road to transport the large quantities of cement needed for mortar (more than 55,000 barrels) and all other materials required for the project. A typical supply trip took several days to travel round trip from Casper to the site and back. The fastest recorded effort was 3 days, while the longest was 76. The teamsters were required to haul freight in all kinds of weather and, in winter, often had to contend with sub-zero temperatures and snow-covered roads.

By November 1905,Geddis and Seerie had built their contractor's camp just to the north of the dam site work area, on a flat rocky area that would later be cleaned up to be used as the dam spillway. The contractor's camp contained a bunkhouse, a dining hall, food storage cellars, offices, and two privy toilets. The camp was solely for the workmen; their families could not live in the camp, and there were no nearby towns to house families. Laborers, with or without families, apparently were not provided housing, but lived in dugouts, tents, and shacks in the gullies adjacent to the construction camp.

From the first day Geddes and Seerie arrived at Fremont Canyon, to the last stone laid, finding qualified workers was a constant strain. The distance from towns made it difficult to hire and retain experienced and reliable workers, as many workers found the camp isolated and disliked being away from their families for long periods of time. As was common at the time, most men worked 6 days a week, not allowing them time to visit families or entertainments an distance from the dam site. Day-off diversions included hunting and fishing. One of the earliest contracts for laborers was for stone cutters. The job went to a group of Italian immigrants working at the

Sunrise Iron Mines near Hartville, Wyoming. The pay was good for skilled laborers, masons earned 70 to 85 cents an hour, and a driller received 37.5 to 42.5 cents an hour. Common laborers received 35 cents an hour during 1906-07, dropping to 30 cents an hour in 1908-09 as work reached completion.

In spite of its remoteness, Pathfinder's construction plant was up-to-date by standards of the day. Estimated to cost over $60,000, the plant's machinery included 10 guy derricks with 60-foot masts and 55-foot booms to lift loads, two overhead cableways spanning a 350 feet distance across the canyon to move blocks (and likely men) across and down into the canyon, and a concrete mixing plant designed so that one man could handle over 700 sacks of cement in an 8 hour shift, while a second man mixed an equal amount into mortar and concrete (see continuation sheet 9, historic photos #13 and 14). A certain number of strokes on a gong told each worker whether the cement coming down the chute was meant for the concrete, or for the mortar mixer. Efficiency also guided the plant's layout. Machinery was placed side by side under a shelter, so when engineers were scarce or the pace of work was slowed, one engineer could run both hoists. It should be noted that work-site efficiency was a deliberate objective, and not simply a side effect of staff and labor shortages. The USRS embraced the modern workplace efficiency concepts being introduced to American industry, and at Pathfinder they were devising and testing processes that promoted efficiency.

Steam power drove much of the machinery at the dam site, and this required fuel to heat the boilers. It was prohibitively expensive to haul in fuel oil or gasoline, leaving wood as the most viable and available alternative. The contractor who built the diversion tunnel in 1905 consumed all the locally available wood; this forced Geddes and Seerie to obtain wood from the Pedro Mountains, 10 miles south of the dam site. For 2 years, loggers stationed at a mountain camp sawed pine and cedar into cord wood to fuel the construction plant. The machinery burned five cords a day at a cost of $8 to $10 a cord.

During the winter of 1905-1906, Geddes and Seerie began building the coffer dam to divert the North Platte River into the diversion tunnel and around the work site. This allowed them to excavate the river bottom to reach a solid base of granite that would serve as the dam's foundation. A series of setbacks that winter, however, slowed the pace of work. Ice that formed on the river weakened and undermined the coffer dam and, as a consequence, water would seep into the work area and freeze (see continuation sheet 9, historic photos #4-5). Workers had to cut through as much as 3 feet of ice, while working in temperatures as low as minus 29 degrees. Additionally, large quantities of loose rock balanced precariously on the canyon walls above the work site created a danger to workers below. The contractor decided it would be easiest to blast the loose rock from the canyon walls, but the rock didn't fall where planned and hundreds of tons of large rock fell into the work site, which had to be removed; by the end of March 1906, only 25 percent of the loose river rock covering the foundation area had been removed. Regardless, they began excavation of the foundation trench in January 1906 (see continuation sheet 9, historic photo #3), but in late March the spring runoff caused a sudden rise in the river, which flooded the work area and stopped work for a time. The floods deposited large amounts of sediment across the work area. Some of the sand

deposited could be used later in the mortar and concrete, but more time was lost while crews removed sediments from the work area. When this clean-up work was completed, the portion of the 10-foot-deep foundation trench that had been excavated was prepared, with the first granite block foundation stones placed on August 15, 1906 (see continuation sheet 9, historic photo #6). Crews finished excavating the foundation trench and stone placement began in earnest. Substantial progress was made until the weather turned cold (see continuation sheet 9, historic photo #7), at which point stone block placement work had to halt, because the cement mortar would freeze and not properly cure.

Hard, coarse-grained granite blocks used to build the exterior faces of the dam were quarried from two quarried located within a quarter-mile west of the dam. Large pieces of rock, typically about 40 feet square, were first blown out of the quarry using explosives. These were then split into smaller blocks averaging 8 to 10 tons and the blocks were dressed to a uniform shape. The shaped blocks were hauled to the construction site and placed into position by cables. The core of the dam was cyclopean masonry, consisting of granite blocks and rubble in concrete, with the volume of rock occupying 48.2 percent of the total volume of masonry (see continuation sheet 9, historic photo #10). The granite blocks for the core were obtained from a quarry immediately north of the dam, and were generally trimmed to about a 3-foot block (see continuation sheet 9, historic photo #12). Refuse stone from the blasting and trimming was also used in the cyclopean core. To make the dam impervious to leaking, all voids had to be filled. This was achieved by bedding each granite block in up to 10 inches of concrete mortar. The best results came from "rich" concrete mixed very wet in order to fill every crack. A wet concrete mixture was used as it was much easier to work into crevices than a stiffer mixture. Before placing the mortar bed for a stone, the area was swept and washed down with a hose to remove all loose material. Then masons shifted stones so they were properly positioned; this took a lot of prying and lifting of the blocks (see continuation sheet 9, historic photo #7).

In 1907, work on the dam proceeded rapidly, despite the “normal” problem of flooding in the canyon (see continuation sheet 9, historic photos #8-9 and 11). By fall of 1908 the dam was nearly full height and the Emergency Gatehouse for the north outlet tunnel high-pressure gates was under construction (see continuation sheet 9, historic photo #13 and 15). As construction of the dam approached completion in 1909, attention turned to constructing the spillway and finishing the outlet tunnels. For the spillway, Reclamation took advantage of a shallow natural channel situated immediately north of the dam and about 400 feet from the north side of the canyon’s upper wall. The channel would, with some modification, carry water around the dam and then allow the water to fall 184 feet down the canyon wall to the river a safe distance below the dam’s toe. The bedrock granite at the upper end of the natural channel was shaped to create a 650-foot-wide flat-crested weir, with a crest elevation at 5850.1 feet. It was an uncontrolled weir. Loose or particularly intrusive rock was cleaned from the bed; this largely eradicated the remains of the main quarry. A concrete training wall (also called a guide-wall) was built along the south (right) rim of the spillway extending from the dam abutment, to ensure water in the spillway did not cascade off the canyon wall too close to the dam toe or the north tunnel outlet (see continuation sheet 9, historic photo #17).

Two small stone and concrete dikes were also built within the spillway to help direct water to the spill-point. The spillway could carry 55,000 cubic feet per second of water at a depth of 8 feet at the spillway crest.

The diversion tunnel was converted to use as the north outlet tunnel. In the opinion of the Ernest H. Baldwin, the man in charge of construction at the dam site, the one task that merited the title of "a nasty job," was the installation of the grating at the inlet to the north tunnel that would prevent debris from lodging in opening (see continuation sheet 9, historic photo #16). While he characterized it as "a small piece of work," stormy weather and complications transporting equipment to the mouth of the tunnel made it the most exasperating element of construction. The steep and rocky sides of the canyon made it impossible for a team to get down the canyon wall to the location, and the force of the rapids at the canyon's upper end made it difficult for crews landing by boat. Ultimately, they built a 185 foot long chute, inclined at a 66 degree angle, down from the top of the canyon to a point where teams could come close to the river bank, and materials we sent down the chute to the riverbank. Their fall was controlled using a pulley system mounted on a tripod at the top end of the chute.

In May 1909 Geddis and Seerie completed their contracted work. They departed the site, leaving behind much of the materials and equipment they hauled in, for transporting the materials back to their Denver headquarters was too expensive. Some facilities would seem to have been removed; a photograph dated October 1909 shows only one of the two construction cableway systems still in place.

At the time the dam was completed in May, the reservoir was already rapidly rising. This occurred because of runoff from the mountains in western Wyoming was 50 percent higher than normal. By the last week of June, 1909, articles published newspapers as far away as Denver were saying the dam was in danger of failing, and that the USRS had blown the top off the dam to prevent a catastrophic failure. People along the river panicked. The USRS was confident that the dam was sound, but was concerned that, if the reservoir continued to rise, water could flow through a natural low area about a quarter mile south of the dam and cut a new river channel that bypassed the dam. The USRS hastily assembled a large force of workers to build a temporary dike to plug the gap.

By July 10, more than 740,000 acre-feet of water had collected behind the dam, but workers completed the dike before a washout occurred. But, in case the temporary dike could not be completed in time or failed, the USRS inserted five dynamite charges into the top 20 feet of the newly-finished dam. If necessary, they were prepared to blast away as section of the crest and allow water to escape through this artificially-created breach. This was viewed as preferable to having a new channel cut that would have left the dam standing tall and strong, but with a reservoir that would no longer hold water.

In March 1910, the USRS began construction of Pathfinder Dike, a permanent structure to close off the low area south of the dam. Seventy-five men and 50 teams of horses were brought in from Denver to perform the work (see continuation sheet 9, historic photo #20).

Crews worked in two shifts of 10 hours each, and finished the dike by May 1911.

From the beginning, perhaps even before the dam was fully completed, it was clear that the north and south outlet systems were not capable of handling the high pressure flows created by a reservoir the size of Pathfinder Reservoir. The flood releases in 1909 had damaged the concrete surfaces of the north and south outlet tunnels, as well as the gates and valves that controlled the flow of water through the tunnels. By July 1912, the floor of the south outlet tunnels had been badly damaged by water flow, and the gates installed to control the water flow could not seal the tunnel. It was decided that a new tunnel would have to be bored into the rock face. This new work commenced immediately and, by April 1913, the auxiliary tunnel was complete. However, it proved to be the first in a long series of actions needed to reconstruct the outlet systems.

More problems arose with the outlets during the 1913 and 1914 operating seasons. In response, in 1915 improvements were made to the valves and piping in the tunnels, several leaks were plugged, and new collars were fitted to the valves. USRS management recognized these steps were merely interim repairs and that further work would likely be needed. It was clear materials used to construct the tunnels were not able to stand up to the extreme water pressures that occurred during high releases. Experiments were carried out in 1916 and 1917 to test new concrete liners and other materials, and the engineers considered options for new gates and valves. By 1919, only one of the gates in the north tunnel could be used. The others had been damaged and could not be operated safely, and it was decided that new valves and gates would have to be installed. This would be a substantial undertaking, involving many workers and large amounts of equipment and supplies. The Sluice Gatehouse was constructed at this time to service the renovated north outlet.

It was during the 1912 south outlet rehabilitation work that an accident occurred resulting in the deaths of five men. This was the only fatal accident recorded during Pathfinder's long construction period. On the evening of February 9, 1912, one of the “crow’s foot” anchor cables for the cableway’s south tower snapped under load while transporting concrete across the canyon. Five men pouring concrete for the south access ladderway were struck by the wildly whipping cable, sending those men 160 down to their deaths. John Wood, John McLaughlin, W.A. Phillips, Barney Flynn, and Christ Moor were the men who died. This cableway was constructed in 1905 and used throughout the dam’s construction.[13] The USRS decided that the original towers, with their crow’s foot anchorages, were not sufficiently sturdy to use for the outlet renovations. Due to World War I funding priorities, however, no money was available to build a replacement cableway until 1920. That year, the original 1905 cableway was dismantled and a new, higher load rated cableway was erected; a new boiler house next to the head (south) cableway tower powered this new system.

[13] North Platte Project History 1902-13, report titled “Accident of February 9, 1912.” See footnote #5 on page 21 for an explanation of the historical discrepancy behind this accident.

9. Major Bibliographical References

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Previous documentation on file (NPS):

____ preliminary determination of individual listing (36 CFR 67) has been requested
X___ previously listed in the National Register (reference #71000888)
____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
_X_ Other
Name of repositories: National Archives, Rocky Mountain Branch, Denver, Colorado
Bureau of Reclamation Library, Denver, Colorado

Historic Resources Survey Number (if assigned): 48NA211 (Pathfinder Dam)

10. Geographical Data

Acreage of Properties: Approximately 80 acres (Main District and the two discontiguous areas combined**)**

Latitude (L) and Longitude (La) Boundary Coordinates of Main District (see Map 3)

Starting at **point 1** northeast of the dam tender complex barn (L106.8517 La42.4723) proceed on a straight line due west to **point 2** (L106.8551 La42.4723), then turn south and head to **point 3** west of the north abutment of Pathfinder Dike (L106.8551 La42.4665); head due east for a short distance to **point 4**, the boundary line between Sections 23 and 24, T.29N, R.84W (L106.8540 La42.4665); proceed south along section boundary line to **point 5** southwest of Pathfinder Dike's south abutment (L106.8540 La42.4619); head east to **point 6** southeast of Pathfinder Dike's south abutment (L106.8517 La42.4619), then head directly north to starting **point 1.**

7B Connector: Pathfinder Road is the connector to the secondary quarry (48NA211-7B, Element 7B). The connecting point is on the western boundary at L106.8551 La42.4669, and proceeds west along the road to connect at the quarry's northeastern coordinate (L106.8568 La42.4699).

Longitude and Latitude Coordinates and Approximate Acreage of Main District Elements

Pathfinder Dam (48NA211-1, see Site Drawing 2): Starting at the most northern point of the **facility access walkway** across the spillway (L106.8535 La42.4699) proceed on the right hand side of the walkway, following the walkway curve, to the western edge of the **Fixed Wheel Gatehouse** (L106.8541 La42.4684); proceed south-southeast to a point approximately 50 feet west of the dam's **elevator machine house** (L106.8543 La42.4681); proceed on a slight southeasterly curve just west of the dam's upstream face to the dam's **south abutment** (L106.8535 La42.4674); proceed east to the south end of the **cableway powerhouse** (L106.8531 La42.4674); bear hard left and proceed north to western edge of the spillway wasteway (L106.8529 La42.4683) head east along the edge of the cliff to the eastern edge of the spillway wasteway (L106.8522 La42.4685) then head north-northwest adjacent to the remnants of the Main Quarry to the start point. **Approximately 11 Acres.**

Pathfinder Dike (Element 2, 48NA211-2, see Site Drawing 3): Start at the north edge of the dike's northern abutment (L106.8529 La42.4666) and proceed in a southerly direction along the west edge of the upstream face to the south abutment (L106.8526 La42.4624), then head north along the west edge of the service road next to the downstream face back to

the start point at the north abutment. Midpoint of the dike is approximately L106.8526 La42.4688. **Approximately 7 Acres.**

Dam Tender Complex (Element 3, 48NA211-3, see Site Drawing 4)): Start at a point near the southeast edge of the parking lot next to the access road on line approximately equal with the south edge of the clothesline (L106.8521 La42.4717); proceed north a few feet east of the tree line to approximately 25 feet northeast of the barn (L106.8522 La42.4721); proceed due west to a point approximately 60 feet north-northwest of the northwest corner of the post and cable fence line (L106.8531 La42.4721); proceed south a few feet west of the fence to a point directly west of the south edge of the clothesline (L106.8530 La42.4717); then proceed east skirting the clothesline's south edge to the starting point. **Approximately 1 acre.**

Secondary Quarry (Element 7B, 48NA211-7B, see Site Drawings 2 and 5): About 1,000 feet west of the spillway. The boundary is a square with the northwest corner L106.8574 La42.4699; southwest corner L106.8574 La42.4694; northeast corner L106.8568 La42.4699; and southeast corner L106.8568 La42.4694 (the northern boundary is adjacent to Pathfinder Road, the connector to the Main District). **Approximately 5 Acres for both.**

Longitude and Latitude Coordinates and Acreage of Elements, Discontiguous Areas (see Site Drawing 6)

Engineer's Camp (Element 5, 48NA211-5): This is triangulated on approximate lot dimensions of approximately 380 feet along the north south axis and 800 feet along the east-west axis. Triangulated, the cistern (Camp Feature A, L106.8547 La42.4665), marks the northernmost point; a stone foundation (Camp Feature O, approximately L106.8474 La42.4665) marks the western point; a concrete foundation, (Camp Feature P, L106.8457 La42.4651) is the southernmost point, and the northeast corner of the concrete foundation (Feature F, L106.8450 La42.4661) is the easternmost point. The only structure that still stands, Feature B, is at L106.8454 La42.4657. **Approximately 7 Acres.**

Stream Gage Station (Element 6, 48NA211-6): A point located at L106.8469 La42.4651. **Approximately < .25 Acre**

Verbal Boundary Description

The Pathfinder Dam Historic District consists of a rectangular 64 acre area designated as the Main District that encompasses three contributing Elements (Elements 1, 2, 3), and includes a smaller rectangular area (Element 7B) that lies west of the Main District but is attached to it by a linear feature. The district also includes two discontiguous areas (Elements 5 and 6), each located about one-half mile downstream of the Main District.

Inside the generally rectangular Main District is **Pathfinder Dam** and all associated operational features that are grouped as Element 1 (the spillway, Emergency Gatehouse, south access ladderway, 1920 cableway system and the cableway powerhouse, and a remnant of the rail system); **Pathfinder Dike** (Element 2), located about 750 feet south of the dam; the **Dam Tender Complex** (Element 3) consisting of the house and barn; and the **Secondary Quarry** (Element 7A), located about 1,100 feet northwest of the spillway and connected to the Main District by the former Pathfinder Road (the road is non-contributing). See Map 3 and Site Drawing 1 and 2.

Discontiguous Area for Element 5, the Engineer's Camp, is an area encompassing about 7 acres on a bench located on the north side of the North Platte River about one-half mile below the Main District. The discontiguous area for Element 6 is a small area immediately surrounding the gage station, located on the north bank of the North Platte River about one-half mile below the Main District. See Map 3.

Boundary Justification

When preparing this nomination, Reclamation contacted the Office of the Keeper of the National Register for recommendations on how to develop boundaries for the PDHD. Of concern was the fact that the principle concentration of resources associated with the construction and operation of Pathfinder Dam were separated from two isolated associated resources by large intervening spaces that contain no historic resources. Reclamation requested input on whether it was appropriate, given the specific resources and site conditions, to have one Main District and two discontiguous areas within the historic district. It was agreed the preparation of a district nomination with two discontiguous areas was appropriate because the following circumstances exist:

- No visual continuity exists between the Main District's Elements and the Elements within the two discontiguous areas. A high ridge and the walls of Fremont Canyon lie between the Main District and the two discontiguous areas, so neither of these two areas are visible from the main district, and vice-versa. Furthermore, visual continuity of the Elements is not a factor of their historical significance.
- The intervening space that separates the Main District and the discontiguous areas and their constituent Elements lacks significance.
- Significant Elements are interconnected by natural features (i.e., Pathfinder Dam and the stream gage station, which is located on the river downstream from the dam).

The boundary of the Main District is drawn to include the dam, which spans the steep-walled Fremont Canyon and historically and operationally associated Elements that are located on geographic proximity, and where visual and/or physical connectivity is important to their historical and operational association. The Main District boundaries are arbitrarily determined to encompass these features.

The two discontiguous areas are Element 5, the Engineer's Camp, and Element 6, the stream gage station. They are both located about on-half mile downstream of the dam. The land and intervening space between the Main District and discontiguous areas is not significant. Element 5's boundary is defined by the distribution of site features across the broad bench where the site is situated. Site features are generally in three groupings of multiple features and two isolated features. Boundary lines connecting those built features generally follow the natural topography contours of the bench. Element 6's boundary is defined by the structure and a portion of the north bank of the river where the structure sits, and a small portion of the river channel itself.

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11. Form Prepared By

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Date: January 1, 2015

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.)

Photo Log (please see Section 9 continuation sheet)

Name of Property:	Pathfinder Dam Historic District (48NA211)
Vicinity:	Alcova
County:	Natrona
State:	Wyoming
Name of Photographer:	Jim Bailey, Ph.D., Bureau of Reclamation
Date of Photographs:	May 29 and 30, 2013; September 9, 2014
Location of Original Digital Files:	Bureau of Reclamation, Denver CO 80225
Number of Photographs:	50

Photo 1 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0001)
Pathfinder Dam, camera facing west.

Photo 2 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0002)
Pathfinder Dam from south abutment, camera facing north.

Photo 3 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0003)
Pathfinder Dam and elevator, camera facing northwest.

Photo 4 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0004)
Pathfinder Dam, south access ladderway, south tunnel outlet, and south outlet auxiliary tunnel balanced valve control house, camera facing southwest.

Photo 5 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0005)
Pathfinder Dam upstream face, Emergency Gatehouse, and new spillway ogee weir, camera facing southeast.

Photo 6 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0006)
Emergency Gatehouse, Fixed Wheel Gatehouse, Pathfinder spillway new ogee weir and concrete apron, and facility access walkway, camera facing south.

Photo 7 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0007)
Pathfinder new spillway ogee crest and apron, and Fixed Wheel Gatehouse, camera facing south.

Photo 8 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0008)
Emergency Gatehouse, camera looking west.

Photo 9 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0009)
Section of Pathfinder spillway, Sluice Gatehouse, and north cableway tower, camera facing northwest.

Photo 10 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0010)

North outlet system high-pressure gates and river outlet works control house access structures, camera facing northwest.

Photo 11 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0011)
View from above of the high-pressure gates access structure, elevator, and walkways, camera facing northeast.

Photo 12 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0012)
Elevator machine house and elevator at dam crest, camera facing southwest.

Photo 13 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0013)
View of Pathfinder facility at the dam crest elevation, camera facing southeast.

Photo 14 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0014)
Pathfinder Dam crest, camera facing north.

Photo 15 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0015)
LeTourneau electric deck crane (Feature L) and spillway training wall, camera facing southwest.

Photo 16 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0016)
Pathfinder spillway features, camera facing south-southwest.

Photo 17 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0017)
South cableway tower and boiler house (Features M and N), camera facing east.

Photo 18 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0018)
South-side building foundation (Feature O), camera facing north.

Photo 19 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0019)
South cableway tower, camera facing southwest.

Photo 20 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0020)
Cableway system, camera facing northwest.

Photo 21 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0021)
Pathfinder Dike, camera facing south.

Photo 22 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0022)
Pathfinder Dike, camera facing north.

Photo 23 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0023)
Dam tender complex (Element 3) site overview, camera facing northwest.

Photo 24 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0027)

Dam tender house south (primary) elevation, camera facing northwest.

Photo 25 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0026)
Dam tender house and barn west elevations, camera facing east.

Photo 26 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0028)
Dam tender house east elevation, camera facing west.

Photo 27 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0025)
Dam tender complex barn, main (generally south) and west elevations, camera facing northeast

Photo 28 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0024)
Dam tender complex barn, north and east elevations, camera facing southwest.

Photo 29 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0029)
Secondary quarry (Element 7B), camera facing southeast.

Photo 30 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0030)
Secondary quarry, camera facing east-northeast.

Photo 31 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0031)
Main quarry (Element 7A), camera facing north.

Photo 32 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0032)
New spillway concrete ogee weir and apron (Feature J) and facility access walkway (Feature I), camera facing north.

Photo 33 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0033)
Reconstructed footbridge across the North Platte River below Pathfinder Dam, camera facing east (photo provided for illustration purposes only; the structure lies outside the district boundary).

Photo 34 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0034)
Stream gage station, south and west elevations (Element 6), camera facing northeast.

Photo 35 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0035)
Stream gage station, east and south elevations, camera facing northwest.

Photo 36 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0038)
Engineer's Camp, discontiguous Area Element 5, view south from the camp and overview of main camp area, camera facing south.

Photo 37 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0039)

Engineer's Camp, Camp Feature G and view showing ordered alignment of features in the Camp's main area, camera facing southwest.

Photo 38 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0036)
Engineer's Camp, Camp Feature C foundation, and Camp Feature B standing structure north and west elevations, camera facing east-southeast.

Photo 39 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0037)
Engineer's Camp, Camp Feature B south and east elevations, camera facing northwest.

Photo 40 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0042)
Engineer's Camp, Camp Feature B Interior, camera facing southeast.

Photo 41 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0040)
Engineer's Camp cistern (Camp Feature A), camera facing south.

Photo 42 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0041)
Engineer's Camp foundation (Camp Feature I), camera facing southwest.

Photo 43 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0043)
Pathfinder Dam and reservoir overview, facing west.

Photo 44 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0044)
Downstream face of Pathfinder Dam froom canyon floor, camera facing west.

Photo 45 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0045)
South access ladderway (Feature G) from canyon floor, camera facing south

Photo 46 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0046)
Stonework detail and access gallery, downstream face of Pathfinder Dam, camera facing west.

Photo 47 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0047)
Cableway powerhouse (Feature N) south elevation, and cableway tower anchoring system, camera facing north.

Photo 48 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0048)
Detail of cableway bucket, hook, and carriage assembly, camera facing west.

Photo 49 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0049)
North and east elevations, Stream Gage Station, camera facing southwest.

Photo 50 of 50 (WY_Natrona County_Pathfinder Dam Historic District_0050)
Feature R, last known remnants of rail system to haul blocks from the quarries to the dam work site, camera facing west.

Historic Photos, Pathfinder Dam (all photos by U.S. Reclamation Service/Bureau of Reclamation, provided courtesy of the Bureau of Reclamation and to be credited to the Bureau of Reclamation)

Historic Photo 1 of 23
July 16, 1907, 22-horse freighter hauling cement and other construction materials from rail head at Casper to Pathfinder Dam site, 47 miles distant

Historic Photo 2 of 23
Pathfinder Damsite, view taken August 1905

Historic Photo 3 of 23
View taken January 23, 1906, and shows starting of excavation for the foundation of the dam.

Historic Photo 4 of 23
Pathfinder Dam site looking upstream, January 1906

Historic Photo 5 of 23
Pathfinder Dam diversion flume, February 1906

Historic Photo 6 of 23
Pathfinder Dam, laying the first stone, August 15, 1906

Historic Photo 7 of 23
Pathfinder Dam, progress of masonry, October 1906. View shows construction of the foundation

Historic Photo 8 of 23
Pathfinder Dam, downstream face during flood, June 1907

Historic Photo 9 of 23
Pathfinder Dam, downstream face under construction with river flooding through the "notch," July 1907

Historic Photo 10 of 23
Pathfinder Dam, August 1907, construction view showing the internal cyclopean masonry structure of the dam and the finished stone façade

Historic Photo 11 of 23
Pathfinder Dam downstream face (under construction), November 1907

Historic Photo 12 of 23
Pathfinder Dam, 3-foot face stones in storage

Historic Photo 13 of 23
Pathfinder Dam upstream face, 1908. North towers of original two cableway systems shown.

Historic Photo 14 of 23
Pathfinder Dam, contractor's plant on north side of canyon, July 1908

Historic Photo 15 of 23
Pathfinder Dam, upstream face, September 1908

Historic Photo 16 of 23
Trashrack at entrance to north tunnel, February 1909

Historic Photo 17 of 23
Pathfinder Dam, spillway training wall being constructed, March 1909.

Historic Photo 18 of 23
Pathfinder Dam, upstream face, October 1909. Original cableway system's south tower shown.

Historic Photo 19 of 23
Pathfinder Dam, 1909, showing river outflow from the south outlet. Shows one or the two original cableway systems.

Historic Photo 20 of 23
Pathfinder Dike, laying stone paving on the dike's upstream face, August 1910.

Historic Photo 21 of 23
Pathfinder Dam gatekeeper's (dam tender) house, September 1906.

Historic Photo 22 of 23
Pathfinder Dam, 1940

Historic Photo 23 of 23
Pathfinder Dam, 1960s.

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Current Photographs

Name of Property:	Pathfinder Dam Historic District
Vicinity:	Alcova
County:	Natrona
State:	Wyoming
Name of Photographer:	Jim Bailey, Ph.D., Bureau of Reclamation
Date of Photographs:	Photos #1-43; May 29-30, 2013; Addendum (photos #44-50) September 9, 2014
Location of Original Digital Files:	Bureau of Reclamation, Denver CO 80225
Number of Photographs:	50

Photo #1: Pathfinder Dam. Camera facing west.

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Photo #2: Pathfinder Dam from south abutment. Camera facing north.

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Photo #3: Pathfinder Dam, camera facing northwest. Note south access ladderway on canyon wall in the left of the photo (Feature G, contributing). Also note the elevator and associated ladder and walkways (collectively Feature B, non-contributing) leading to high-pressure gate access structure (Quonset hut) and river outlet control house in the lower right corner of the photo (both part of Feature E, non-contributing).

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Photo #4: Pathfinder Dam, south access ladderway (Feature G, contributing), and south tunnel outlet and auxiliary tunnel balanced valve control house (both elements of Feature F, non-contributing). The south tunnel outlet is the large opening visible to lower left of the ladderway; the value house is the small structure in the rock face to the right of the ladderway. Camera facing southwest.

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Photo #5: Pathfinder Dam's upstream face, and Emergency Gatehouse (Feature C, contributing) on the left. Note new concrete spillway ogee weir and apron (Feature J, non-contributing). Camera facing southeast.

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Pathfinder Dam Historic District
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Photo #6: Emergency Gatehouse at left of view; the Fremont Canyon Power Plant Conduit Fixed Wheel Gatehouse at center of the view (Feature K, non-contributing); the facility access walkway (Feature I, non-contributing) across the upstream end of the Pathfinder spillway. The new spillway ogee weir and concrete apron (Feature J, non-contributing) are to the right of the walkway, and the natural (original) surface of the spillway is the left of the walkway. Pathfinder main quarry (Feature 7A, non-contributing) was situated in the area of the spillway seen here to the left of the walkway, and was incorporated in 1909 into the spillway channel. Camera facing south.

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Photo #7: New spillway ogee weir and concrete apron, completed in 2012, Fremont Canyon Fixed Wheel Gatehouse, and Emergency Gatehouse. Camera facing south.

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Photo #8: Pathfinder Dam Emergency Gatehouse (Feature C, non-contributing). Camera looking west.

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Photo #9: In the foreground, a section of the spillway and spillway training wall (Feature H, contributing). Behind, from left are: the Sluice Gatehouse (Feature D, non-contributing) with the Emergency Gatehouse behind it; the north cableway tower and associated concrete anchor pad and connecting cable (Feature M, contributing); and the Fixed Wheel Gatehouse. Camera facing northwest.

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Photo #10: Canyon floor below Pathfinder Dam, north side of river, showing the access structures to the high-pressure gates (Quonset hut to left) and the river outlet works control house (right in canyon wall), and the outlet for the 60-inch Jet-Flow valve (all part of Feature E, non-contributing). Camera facing downward and northwest.

Photo #11: View from above of (from left) the dam's downstream face, the elevator track, walkway, and the high-pressure gate control (Quonset hut) access structure. Camera facing down and northeast.

Photo #12: Elevator machine hoist house and Kimball elevator (Feature B, non-contributing). Camera facing southwest.

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Photo #13: View of Pathfinder facility at the dam crest elevation. From the left: the north cableway tower; Fremont Canyon Power Plant Fixed Wheel Gatehouse; Sluice Gatehouse; Emergency Gatehouse; and south tramway tower. Upper face of the new spillway ogee weir in foreground. Camera facing southeast.

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Photo #14: Pathfinder Dam crest, note safety fencing on right and parapet wall on left, and elevator machine house. Sluice Gatehouse and north cableway tower are immediately to the right of elevator machine house. Camera facing north.

Photo #15: From left, LeTourneau electric deck crane (Feature L, non-contributing), Sluice Gatehouse, and north cableway tower. The spillway training wall extends from the right foreground over to connect with the dam's left (north) abutment in the center of the view. Camera facing southwest.

Photo #16: From left, dam crest, spillway training wall, elevator machine house, north cableway tower, SluiceGatehouse, and Emergency Gatehouse. "Natural" spillway in foreground. The main quarry is out of view to the left. Camera facing south-southwest.

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Photo #17: South cableway tower and cableway powerhouse (part of Feature M and Feature N, contributing). Camera facing east. See Photo #47 for opposite view.

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Photo #18: Foundations (Feature O, non-contributing) on south side of canyon above the south access ladderway. Camera facing north. See historic photo #22 to view the buildings that stood here in 1940.

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Photo #19: South cableway tower , carriage assembly, and cableway powerhouse. Note U-bolt set into granite during dam construction, likely used as a crane or gaff guy wire anchor. Camera facing southwest.

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Photo #20: Long view of 1920 cableway system. From the left, cableway powerhouse, south tower, carriage cable and bucket hook system, and north tower. (Features M and N, contributing). Camera facing northwest.

Photo #21: Pathfinder Dike (Element 2, contributing). Note hand placed granite rock protective facing on the upstream (right) side of the dike. The rubble rock visible on the downstream face is part of the earthen/rock matrix of the dike embankment. See historic photo #20 showing placement of the protective rock in 1910. Camera facing south from north end of the dike.

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Photo #22: Pathfinder Dike. Camera facing north from south end of dike.

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Photo #23: Pathfinder dam tender complex (Element 3, two contributing buildings). Camera facing northwest.

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Photo #24: Dam tender's house, main (south) elevation. Camera facing northwest.

Photo #25: Pathfinder dam tender complex, house and barn west elevations. Camera facing east.

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Photo #26: Dam tender house east elevation. Camera facing west.

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Photo #27: Pathfinder dam tender complex barn, south and west elevations. Camera facing northeast.

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Photo #28: Pathfinder dam tender complex barn, north and east elevations. Note the spillway and Emergency and Sluice Gatehouses visible to the left of barn. Camera facing southwest.

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Photo #29: Secondary quarry (Element 7B, contributing site), with dam in background. Camera facing southeast.

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Photo #30: Secondary quarry. Camera facing east-northeast.

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Photo #31: Remnants of the main quarry (Element 7A, non-contributing), located adjacent to the spillway. Note the concrete dike to help direct water flow. Camera facing north.

Photo #32: New spillway concrete ogee weir and apron (left, Feature J, non-contributing), facility access walkway (center, Feature I, non-contributing), and upper end of natural section of Pathfinder spillway (right, Feature H, contributing). Note the U-bolt set into the spillway bedrock. Camera facing north.

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Photo #33: Footbridge (outside district boundaries) across the North Platte River below Pathfinder Dam. Reconstructed circa 2000. A footbridge has been located at or near this location since the dam construction period. Camera facing east from dam crest. (Photo included for illustration purposes only)

Photo #34: Stream gage station, south and west elevations (Element 6, contributing). Camera facing northeast.

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Photo #35: Stream gage station, east and south elevations. Camera facing northwest. See Photo #49 for north elevation view.

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Photo #36: Engineer's Camp (non-contiguous area, Element 5, contributing to the PDHD), overview looking south toward the river from the hilltop area that holds the principal concentration of camp features. Feature H, foundation, in foreground (see Site Drawing 6). Camera facing south.

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Photo #37: Engineer's Camp, Feature G in foreground. The view shows the ordered alignment of foundations that still convey the layout of the principal area of the camp. Note also that the foundations indicate structural characteristics of the vanished buildings. Camera facing southwest.

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Photo #38: Engineer's Camp, Feature C (concrete foundation) and associated concrete structure Feature B, north and west elevations. Camera facing east-southeast.

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Photo #39: Engineer's Camp Feature B, south and east elevations. Camera facing northwest.

Photo #40: Interior of Feature B, view of North Platte River out of the window. Camera facing southeast.

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Photo #41: Cistern (Feature A) at Engineer's Camp. Camera facing south.

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Photo #42: Engineer's Camp, stone and mortar foundation (Feature I) in a secondary area of the camp. Camera facing southwest.

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Photo #43: Pathfinder facility and Pathfinder Reservoir overview. Camera facing west.

ADDENDUM (September 9, 2014)

Photo #44: Upstream face of Pathfinder Dam from canyon floor. Camera facing west.

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Photo #45: Abandoned concrete access ladderway (Feature G, contributing) from canyon floor. Note rebar used as ladder rungs. Camera facing south.

Photo #46: Stonework detail and plugged access gallery, downstream face Pathfinder Dam. Camera facing west.

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Photo #47: Cableway powerhouse (Feature N, contributing) south elevation. In foreground, guy and tension wire anchors for south cableway tower. Camera facing south.

Photo #48: Detail of cableway bucket, hook, and carriage assembly (contributing). Camera facing west.

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Photo #49: North and east elevations, Stream Gage Station instrument house and concrete stilling well (Element 6, contributing). Camera facing southwest.

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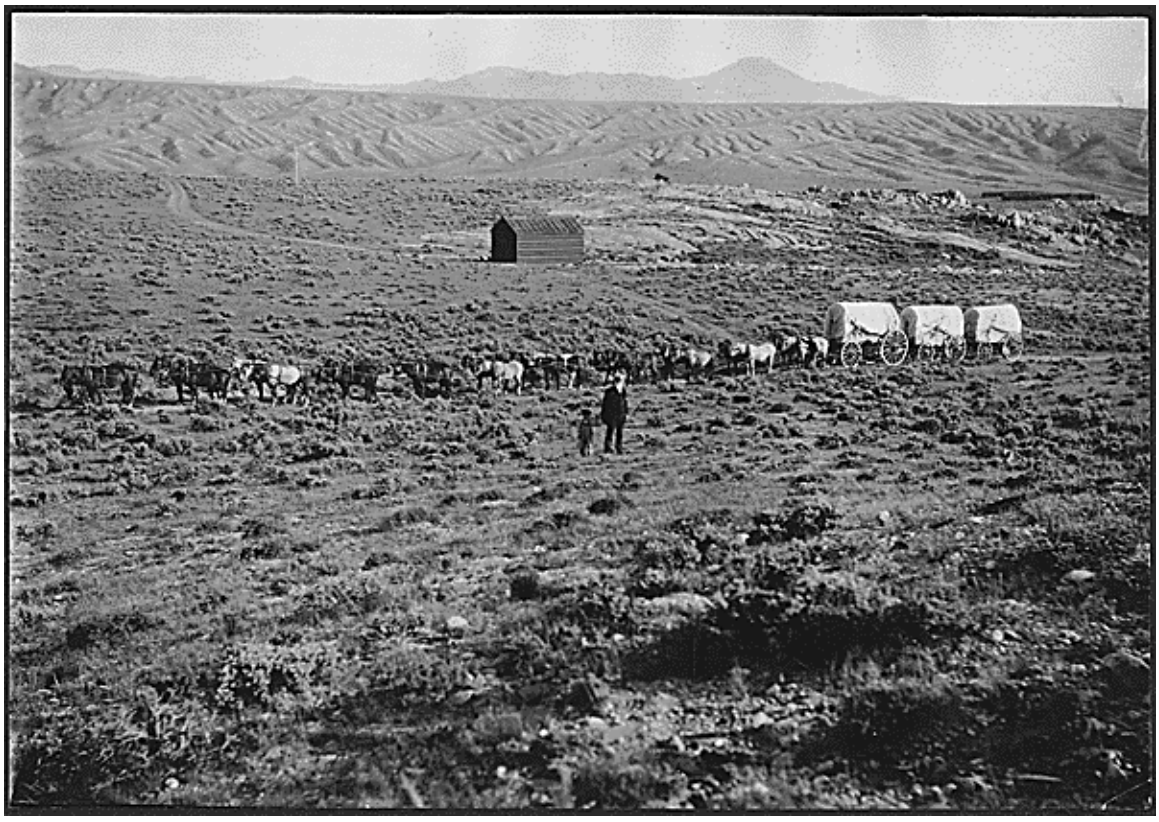
Photo #50: Last known remnants of rail system (Feature R, contributing structure) used to haul blocks from the quarries to the dam. It is located next to the dam's upstream face just below the Emergency Gatehouse. Camera facing down and to the west.

Historic Photos

(all photos courtesy of the Bureau of Reclamation; credit Reclamation upon use of these photographs)

Name of Property:	Pathfinder Dam Historic District
Vicinity:	Alcova
County:	Natrona
State:	Wyoming
Name of Photographer:	Unknown, various U.S. Reclamation Service/ Bureau of Reclamation
Date of Photographs:	1905 through 1960s
Location of Original Digital Files:	Bureau of Reclamation, Denver CO 80225
Number of Photographs:	23



Historic Photo #1, July 16, 1907, Pathfinder Dam, 22-horse freighter hauling cement and other construction materials from rail head at Casper to dam site, 47 miles distant.

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Historic Photo #2: Pathfinder Damsite. This view was taken August 17, 1905 from a point a short distance below the damsite. It shows the river at low water. At the foot of the canyon wall on the right of the picture is the outlet of the north tunnel. The spoil in the channel further up the stream shows the location of the north tunnel intake. The location of the shaft is shown by the waste material near the top of the canyon wall.

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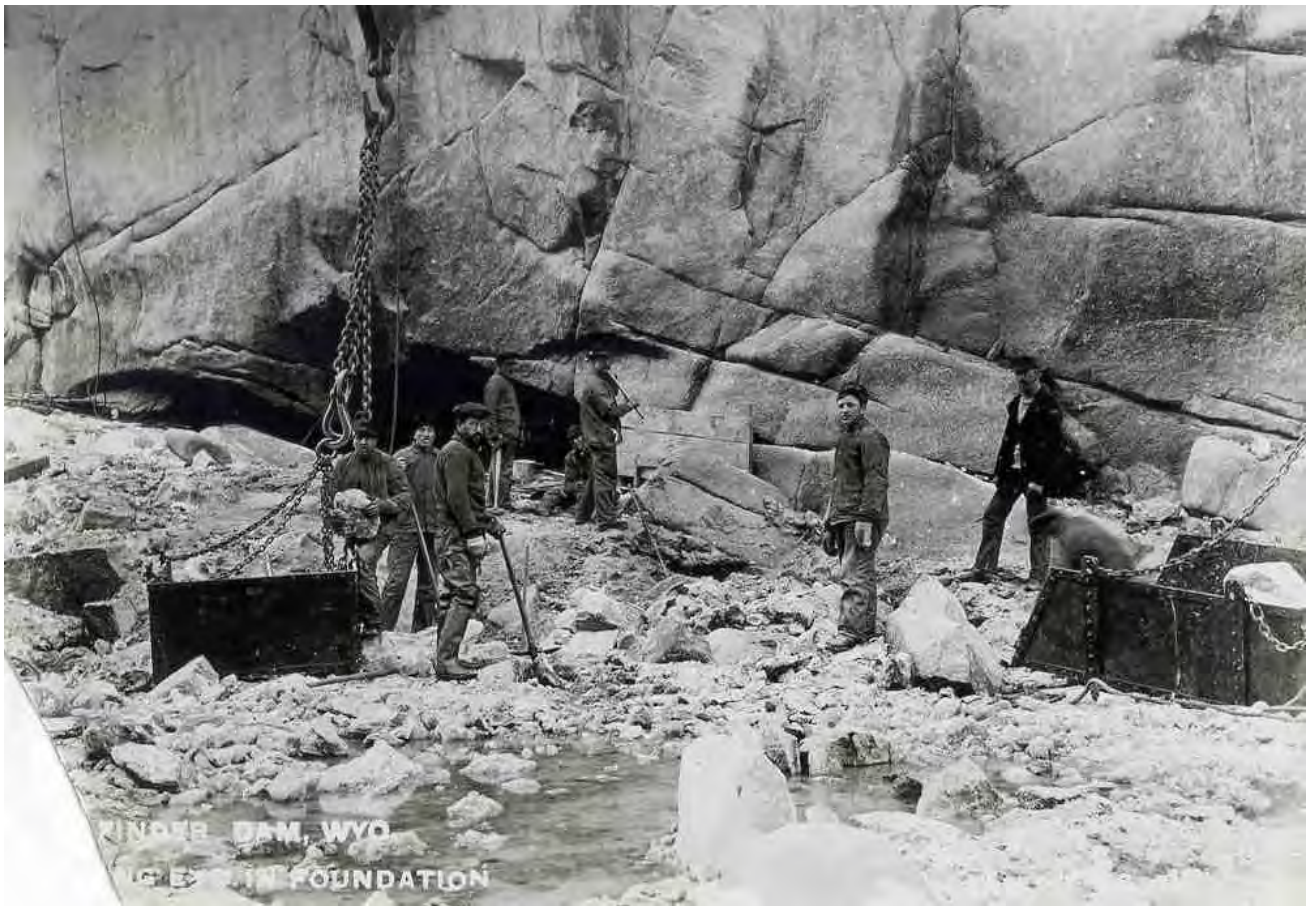

Historic Photo #3: View taken January 23, 1906, and shows starting of excavation for the dam's foundation. All loose material was removed and the top of the rock removed to a sound bedrock foundation only 10 feet below the ground surface.

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Historic Photo #4: January 31, 1906, Pathfinder Dam site looking upstream.

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Historic Photo #5: Pathfinder Dam diversion flume, February 6, 1906

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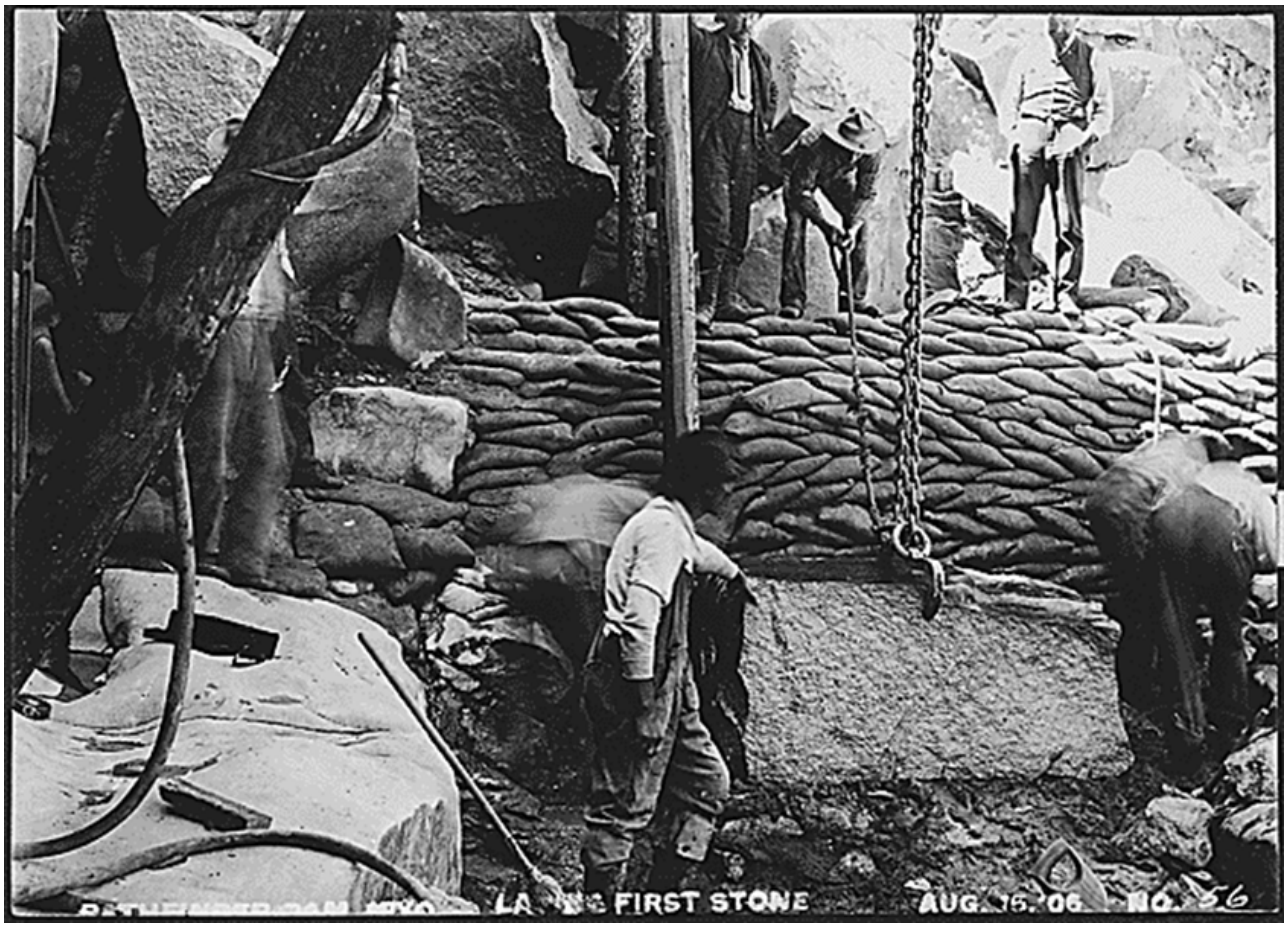

Historic Photo #6: Pathfinder Dam, laying the first stone, August 15, 1906

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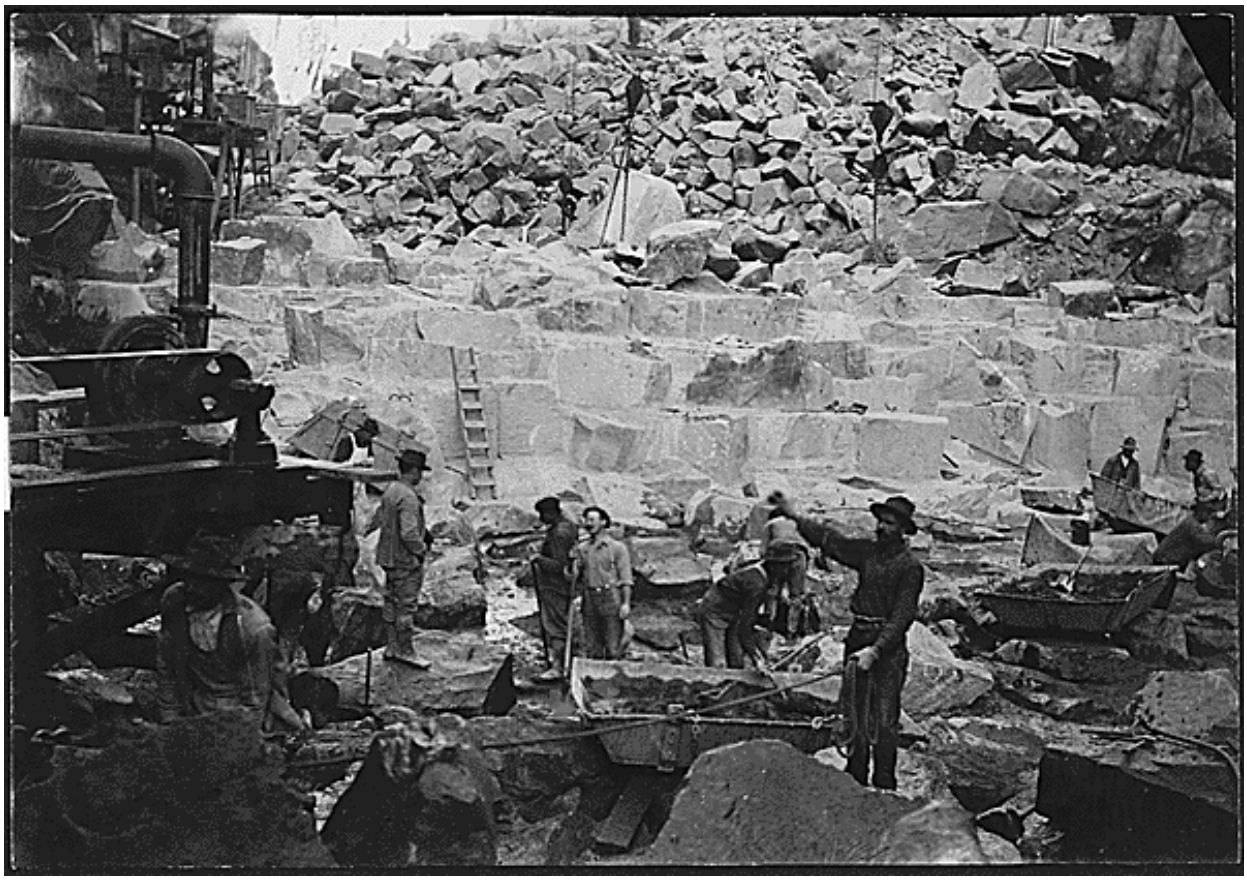

Historic Photo #7: October 1, 1906, Pathfinder Dam, progress of masonry.

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Historic Photo #8: June 8, 1907, Pathfinder Dam, Downstream Face During Flood

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Pathfinder Dam Historic District
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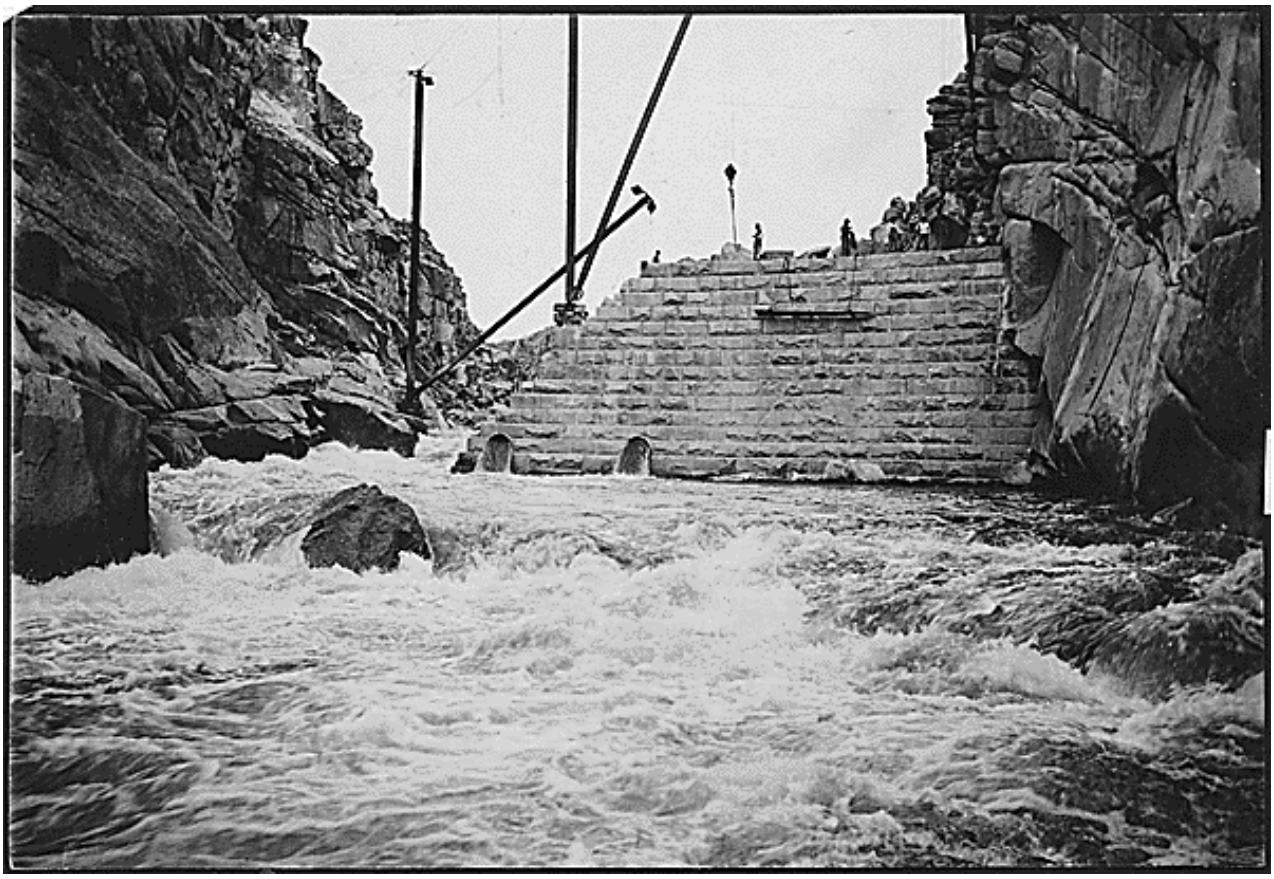

Historic Photo #9: July 26, 1907, Pathfinder Dam, downstream face.

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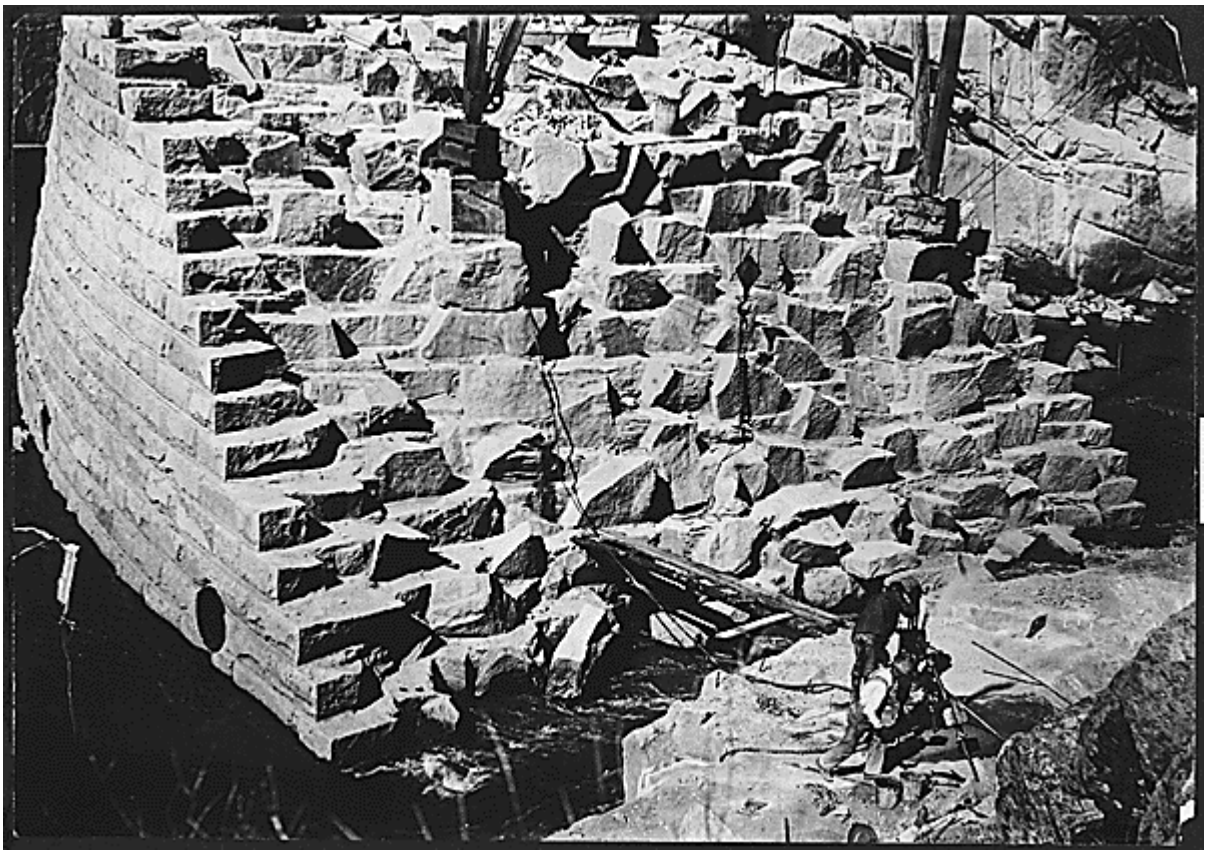

Historic Photo #10: August 9, 1907, rock in masonry, north side of notch. View shows the internal cyclopean masonry structure of the dam and the finished stone façade.

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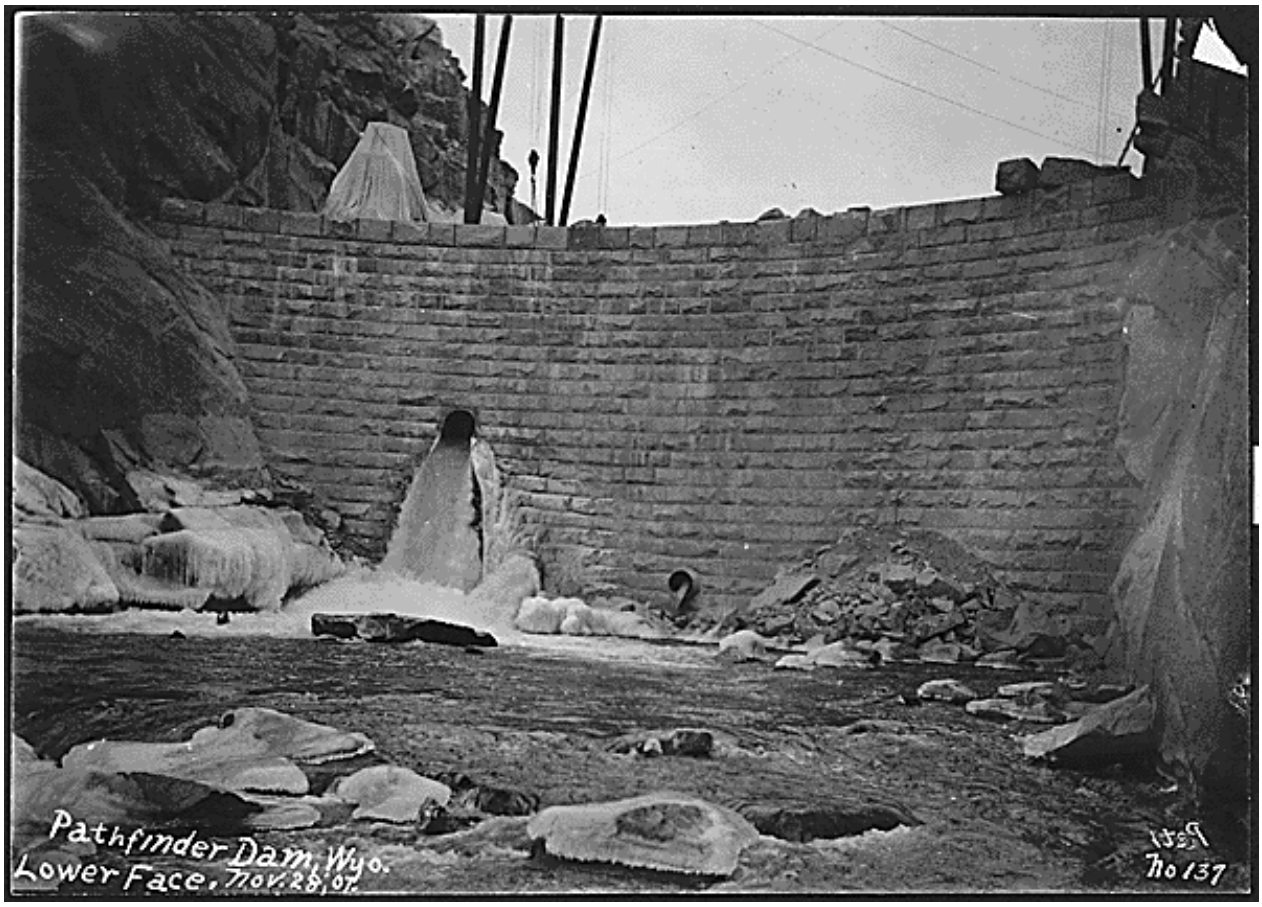

Historic Photo #11: November 29, 1907, Pathfinder Dam, downstream face.

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Historic Photo #13 1908, Pathfinder Dam, three-foot face stones in storage

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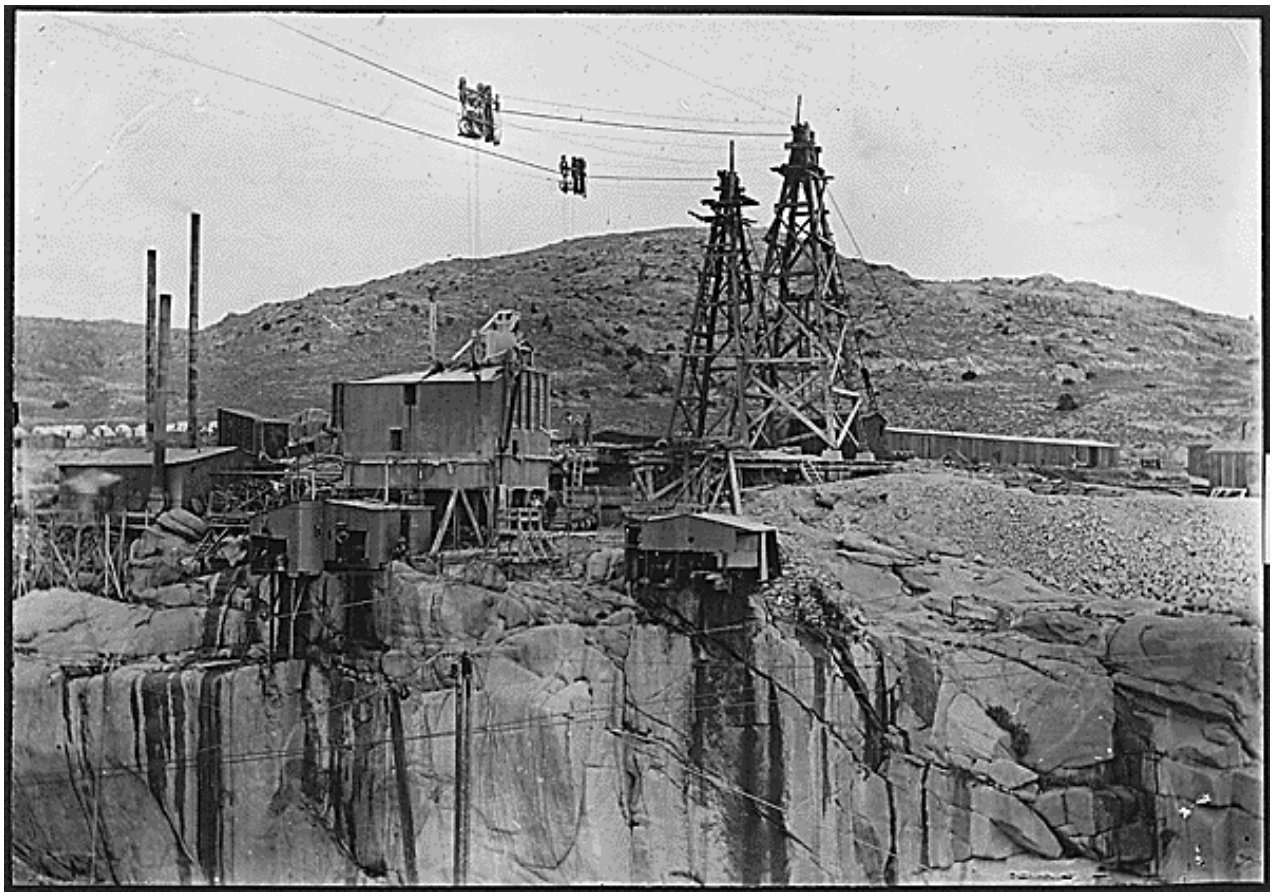
Historic Photo #13: 1908, Pathfinder Dam upstream face. North towers of original two cableway systems shown. Note exposed access ladder on left hand side of canyon, precursor to the enclosed ladderway built a few years later. Emergency Gatehouse under construction (structure immediately next to dam).



Historic Photo #14: July 12, 1908, Pathfinder Dam, contractor's plant on north side of canyon

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Pathfinder Dam Historic District
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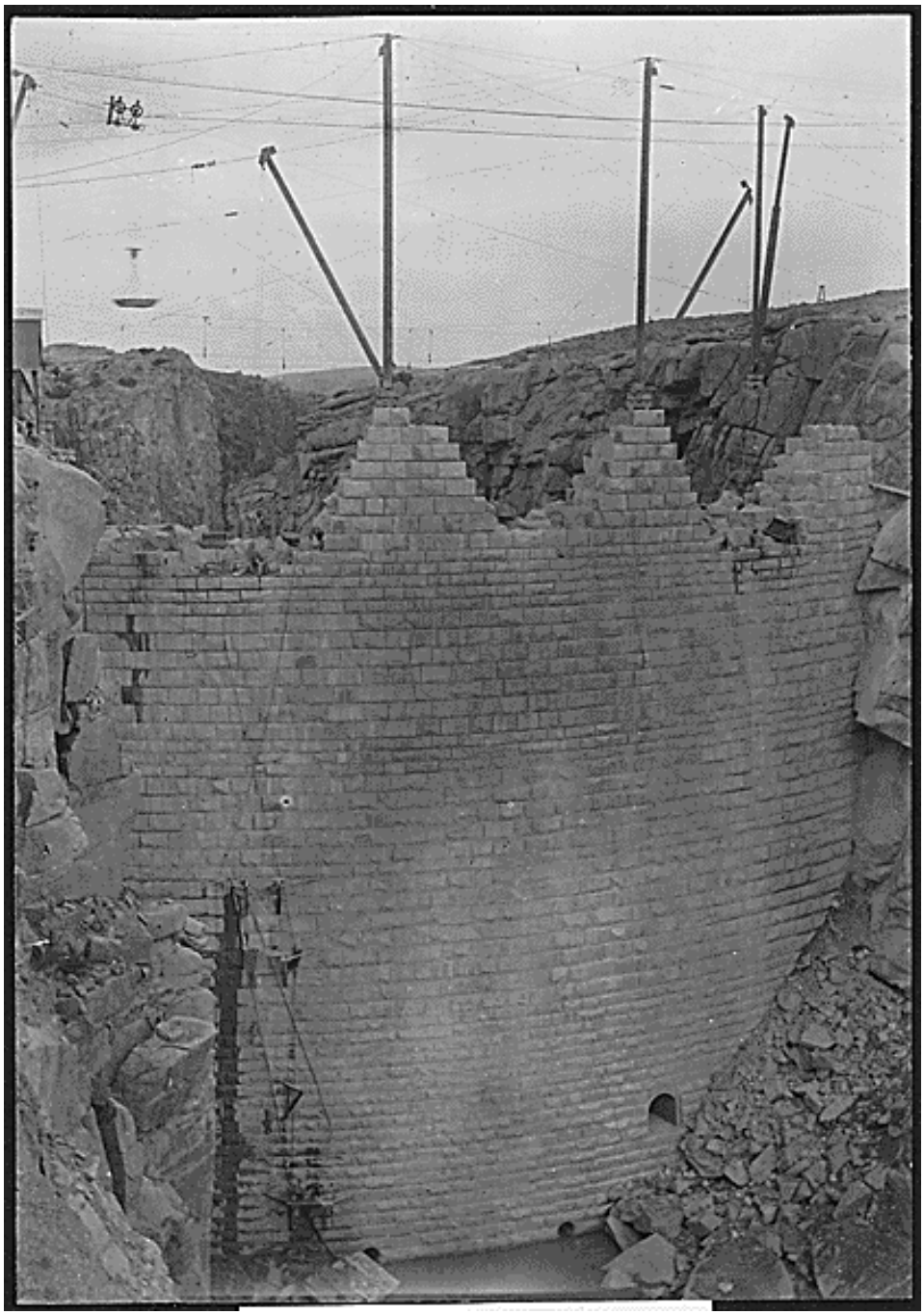

Historic Photo #15: Septemeber 27, 1908, Pathfinder Dam, upstream face

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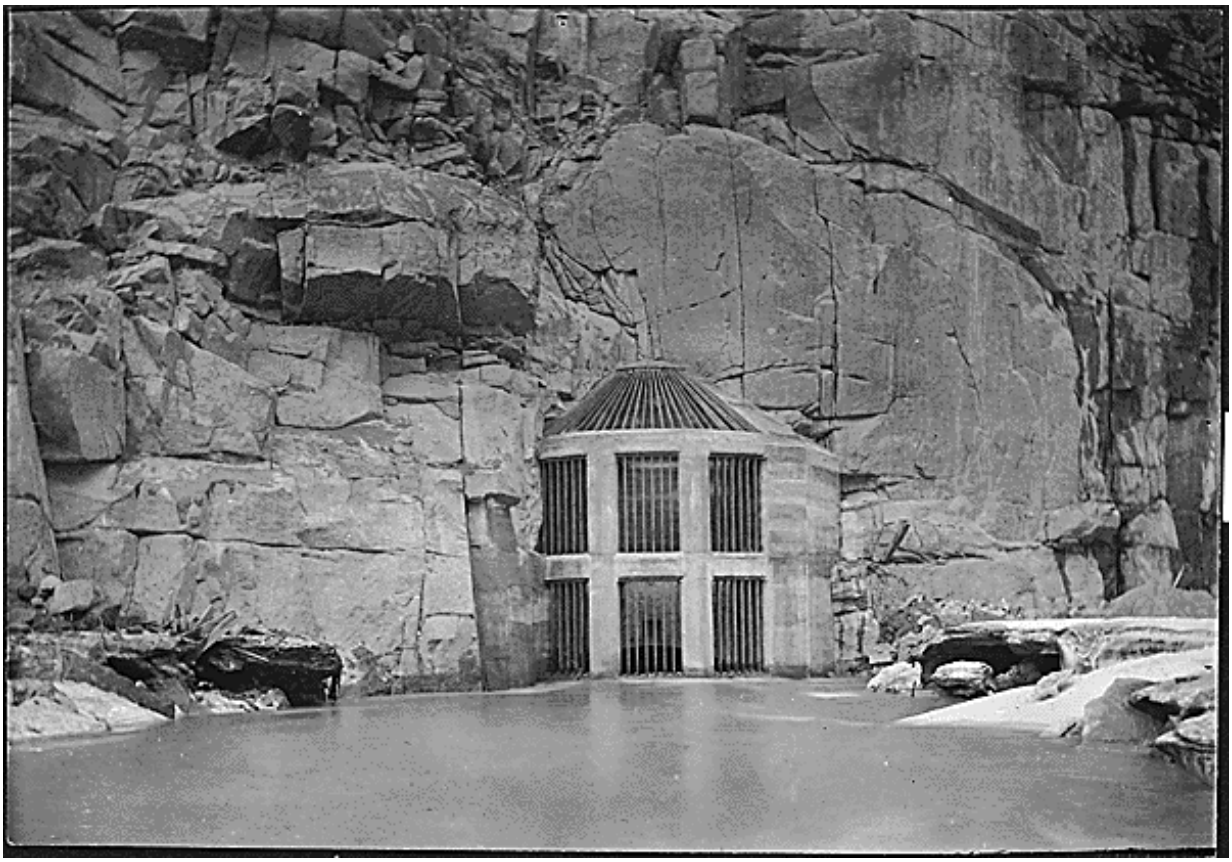

Historic Photo #16: February 5, 1909, grillage at entrance to (north) Pathfinder Tunnel

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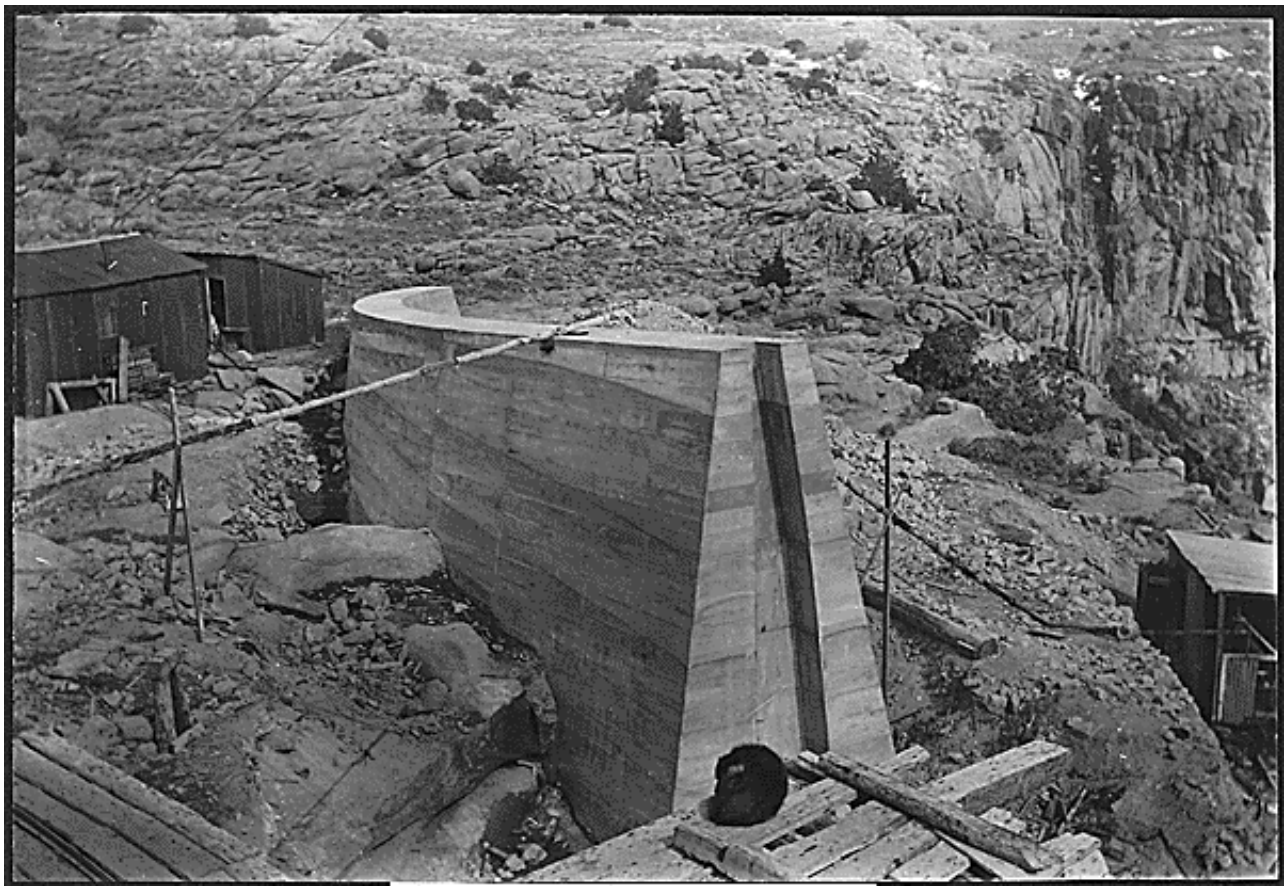
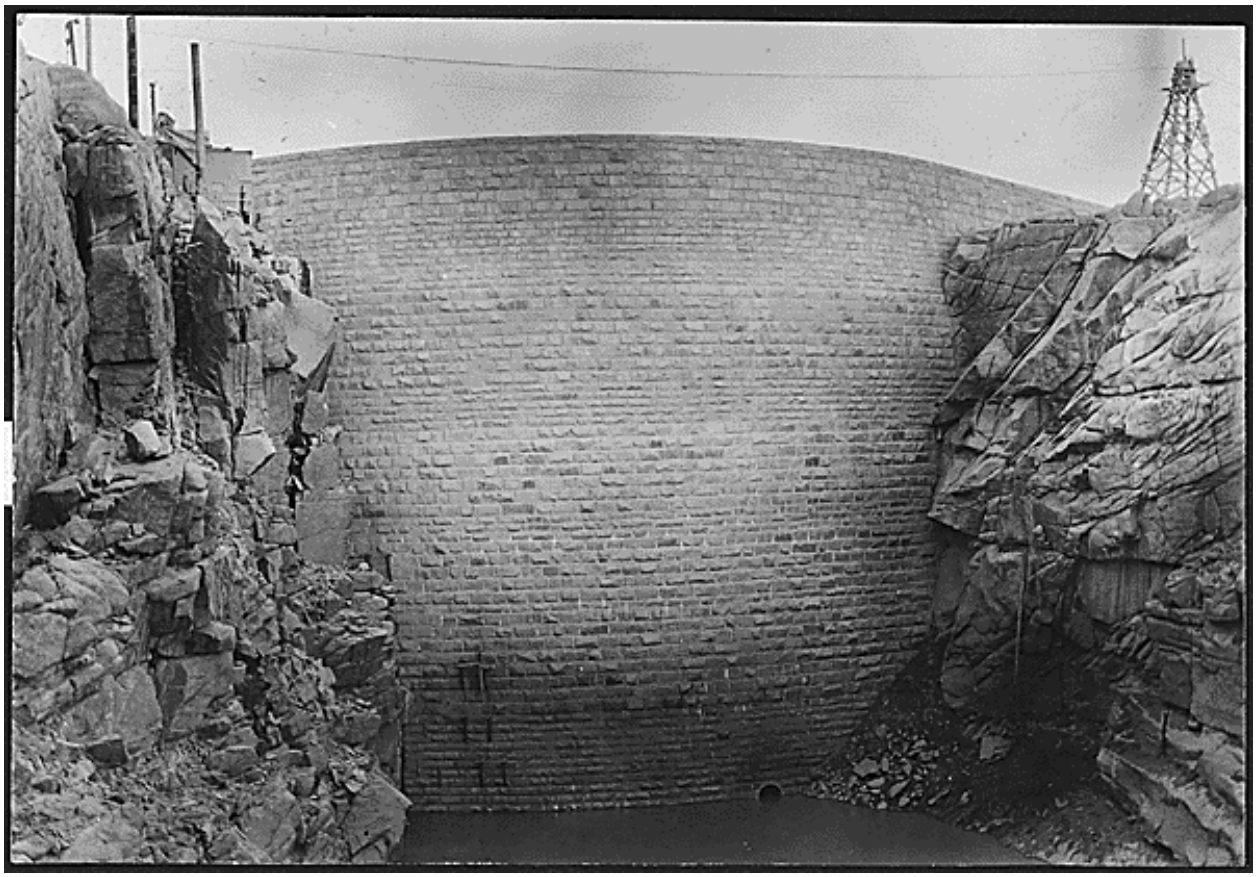


Historic Photo #17: March 20, 1909, Pathfinder Dam, spillway training wall



Historic Photo #18: October 19, 1909, Pathfinder Dam, upstream face. Old cableway system north tower in upper right corner

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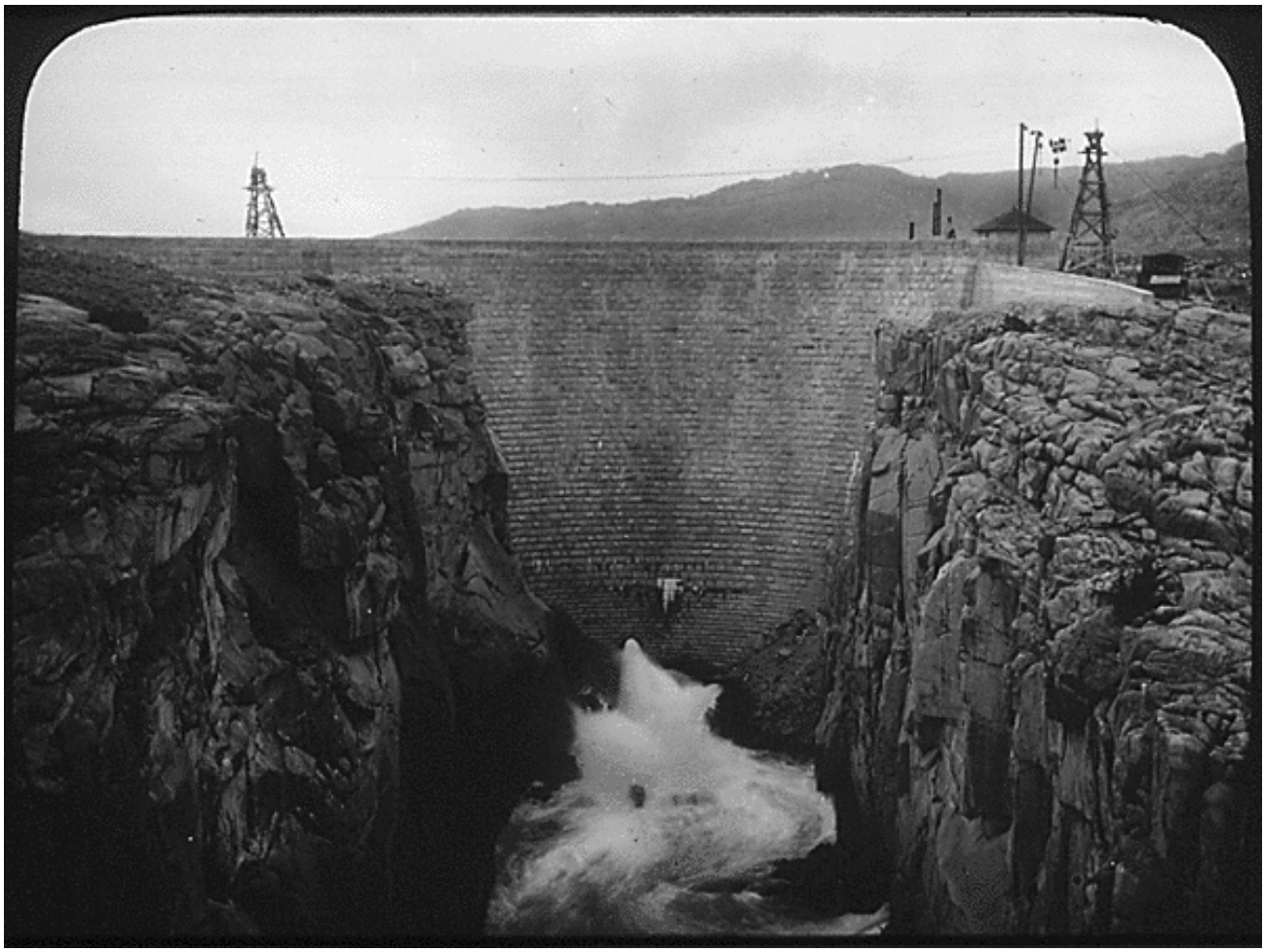
Pathfinder Dam Historic District
Name of Property
Natrona, Wyoming
County and State

Name of multiple listing (if applicable)



Historic Photo #19: Pathfinder Dam, 1909, showing river outflow from the dam conduit outlet. Note that one of the two original cableway systems remains in use. The Emergency Gatehouse roof is visible at right.

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Historic Photo #20: August 8, 1910, Pathfinder Dike, showing stone paving on upstream face.

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Historic Photo #21: September 1, 1906, Pathfinder Dam gatekeeper's (dam tender) house

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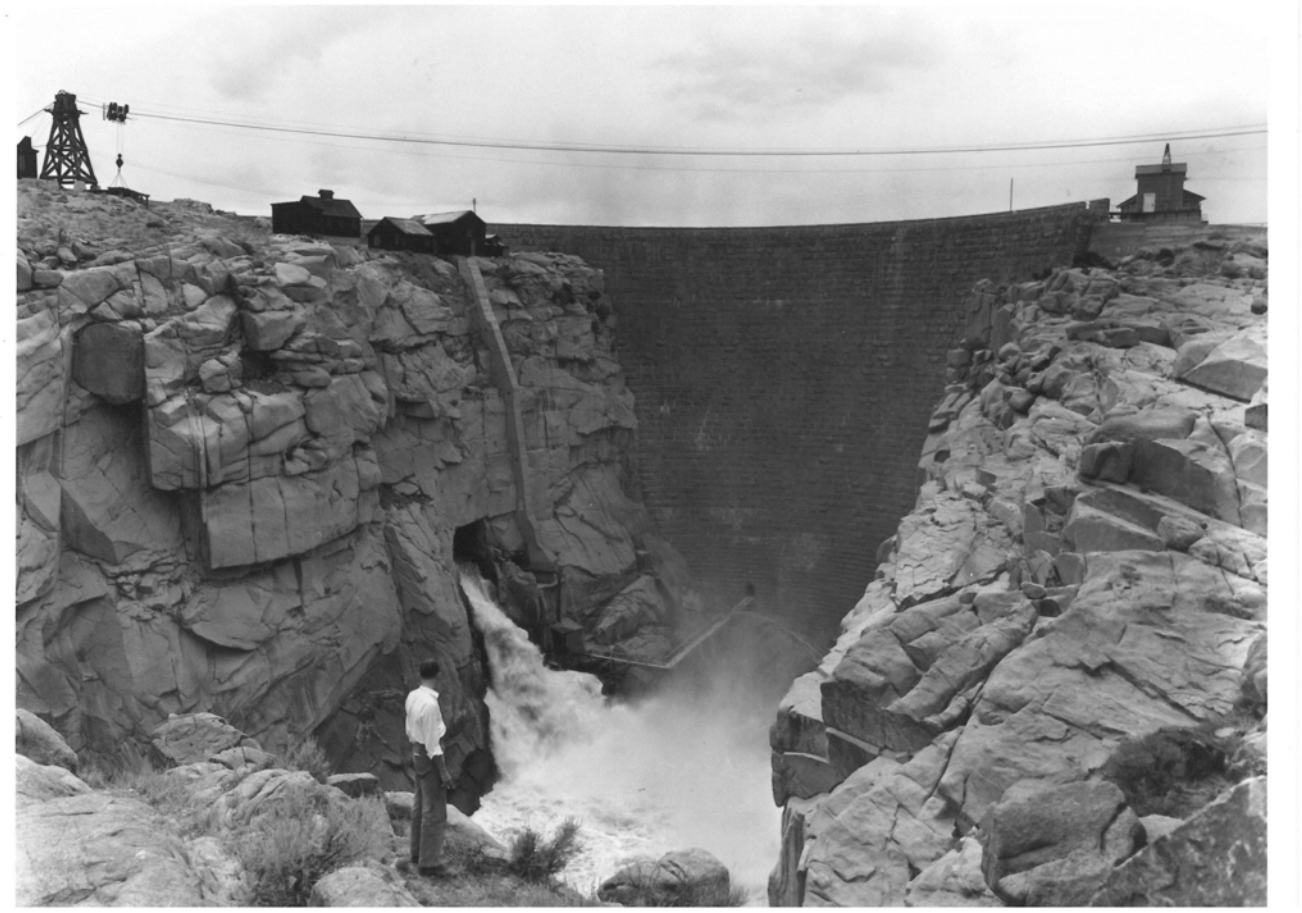
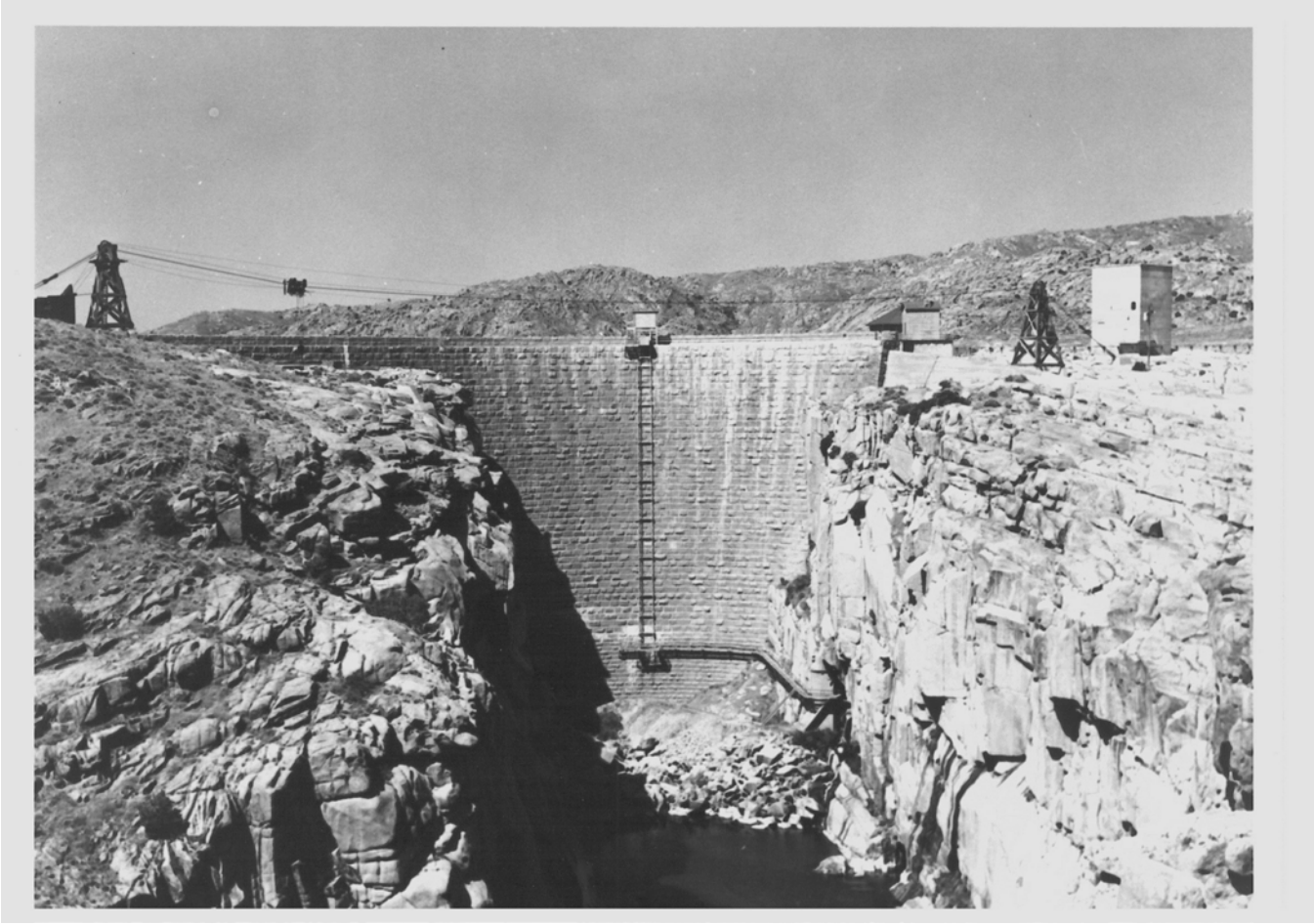
Pathfinder Dam Historic District
Name of Property
Natrona, Wyoming
County and State
Name of multiple listing (if applicable)



Historic Photo #22: Pathfinder Dam, 1940, view looking west at the dam's downstream face. Note the 1920 cableway (extant today), walkway from dam gallery to south outlet tunnel valve house (no longer extant) and south access ladderway (largely extant), and buildings (no longer extant) at the south abutment. Also note Sluice Gatehouse (upper right, extant) still have the gate operating superstructure that was removed during the 1990s north tunnel outlet works renovations.



Historic Photo #23: Pathfinder Dam, 1960s. Note Fremont Canyon Power Conduit Fixed Wheel Gatehouse is now present at far upper right, and a walkway has been constructed from elevator to the High-pressure Gatehouse and river outlet works control structure on north side of the canyon.