Prospect Nos. 1, 2, and 4 Hydroelectric Project

Submitted by Historical Research Associates, March 2011

Looking down on the Rogue River, Prospect No. 1 and Prospect No. 2 powerhouses from the Operator's Village. (Photo courtesy of HRA, 2009)

Project Summary

Prospect Nos. 1, 2, and 4 Hydroelectric Project (the Project, Federal Energy Regulatory Commission [FERC] Project No. 2630) is located in Jackson County, Oregon, on the Rogue River and two tributary streams approximately 45 miles northeast of Medford, Oregon, near the town of Prospect (Figure 1). The Project is owned and operated by PacifiCorp and consists of three concrete diversion dams located on the Middle Fork Rogue River (Middle Fork dam), Red Blanket Creek (Red Blanket dam), and the Rogue River (North Fork dam). Water from a separate facility, Prospect No. 3 (FERC Project No. 2337) on the South Fork (South Fork dam) of the Rogue River, is diverted into the Middle Fork canal after passing through the Prospect No. 3 powerhouse. The dams divert water through approximately 9.25 miles of water conveyance system to a forebay. The forebay supplies water to three powerhouses, with a nameplate capacity of approximately 36.75 megawatts (mW) (3.75 mW from Prospect No. 1 powerhouse, 32 mW from Prospect No. 2 powerhouse, and 1 mW from Prospect No. 4 powerhouse).

The Project meets the National Register of Historic Places (NRHP) eligibility criteria as a historic district under Criterion A, for associations with events that made a significant contribution to the broad patterns of local history, specifically hydroelectric power production and development in the Rogue River Valley.[1] Though no formal NRHP nomination has been completed, preliminary evaluation of the Project indicates a period of significance extending from 1911 to 1933. The presumed Prospect Hydroelectric System historic district includes the linear water conveyance system, diversion dams, powerhouses, and auxiliary residential and administrative buildings of the Project.

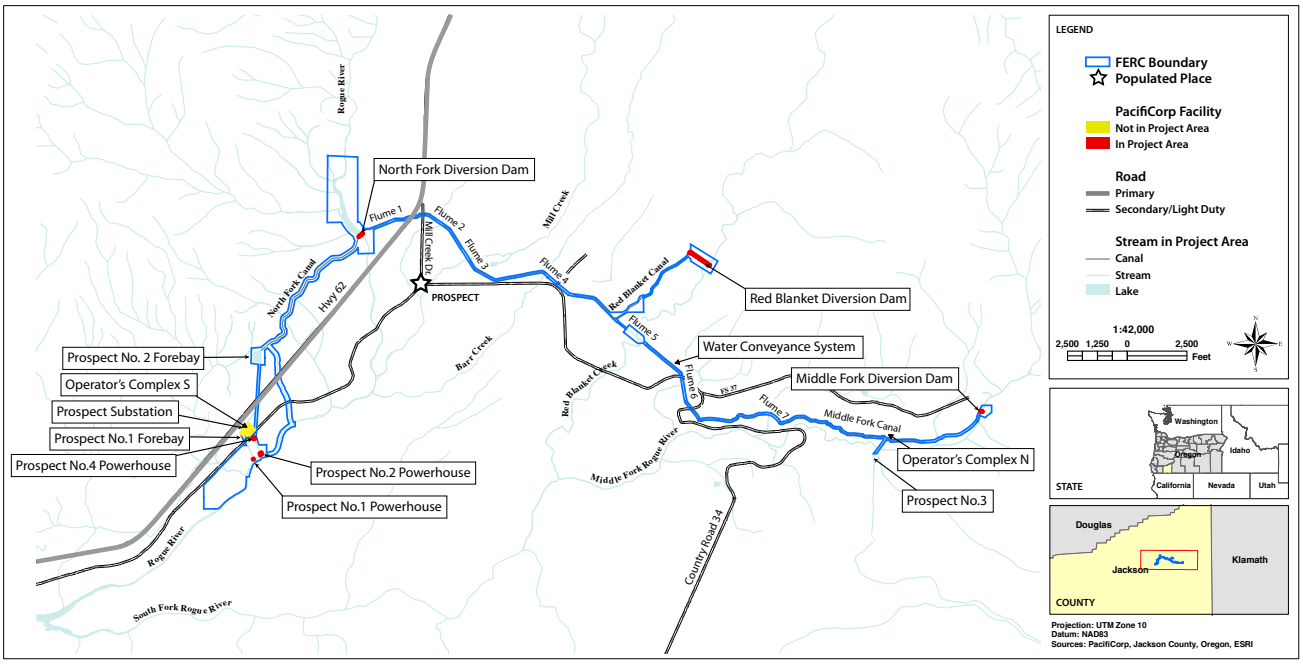

Figure 1. Map of the Prospect Nos. 1, 2, and 4 Hydroelectric Project area.

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Project Information

Name — Prospect Nos. 1, 2, and 4 Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 2630)

Historic Name(s) — Prospect Hydroelectric Plant
North Fork Development
Prospect Diversion Project (California Oregon Power Company [COPCO] Project No. 2001)

Location(s) — Approximately 45 miles northeast of Medford, Oregon, near the town of Prospect, Jackson County, Oregon.

Township 33S, Range 3E, Sections 1, 2, 3, and 6; Township 32S, Range 3E, Sections 27, 28, 29, 33, and 34

Construction Date(s)

1911	Prospect Hydroelectric Plant (Prospect No. 1)
1926-1928	North Fork Development (Prospect No. 2)
1928-1931	Prospect Diversion Project
1931-1933	South Fork Development (Prospect No. 3 [FERC Project No. 2337])
1944	Prospect No. 4 Powerhouse

Engineers — Byllesby Engineering & Management Corporation

Builder — Condor Water and Power Company (Prospect No. 1 Plant)
California Oregon Power Company

Present Owner — PacifiCorp (formerly Pacific Power & Light)

Historic Use — Hydroelectric power facility

Present Use — Hydroelectric power facility

Introduction

The Prospect Nos. 1, 2, and 4 Hydroelectric Project (Project) is located in Jackson County, Oregon, on the Rogue River and two tributary streams approximately 45 miles northeast of Medford, Oregon, near the town of Prospect. The Project is owned and operated by PacifiCorp and consists of three concrete diversion dams located on the Middle Fork Rogue River (Middle Fork dam), Red Blanket Creek (Red Blanket dam), and the Rogue River (North Fork dam). The dams divert water through approximately 9.25 miles of water conveyance system to a forebay. The forebay supplies water to three powerhouses, with a nameplate capacity of approximately 36.75 megawatts (mW) (3.75 mW from Prospect No. 1 powerhouse, 32 mW from Prospect No. 2 powerhouse, and 1 mW from Prospect No. 4 powerhouse).

In 1995, the Oregon State Historic Preservation Office (SHPO) determined that Prospect Project facilities appeared to meet the eligibility criteria for listing in the National Register of Historic Places (NRHP).[2] No formal determination of the Project's NRHP eligibility has been completed, nor have district boundaries or identification of contributing and noncontributing resources been determined aside from inventory conducted as part of the relicensing process and drafting of the Project's Historic Properties Management Plan (HPMP).[3] Based upon a historic context and site history prepared by Historical Research Associates, Inc. (HRA), Prospect Nos. 1 and 2 meet NRHP eligibility criteria as a historic district under Criterion A, with a period of significance extending from 1911 to 1933.[4] As defined in the HPMP, the presumed Prospect Hydroelectric System historic district includes the linear water conveyance system, diversion dams, powerhouses, and auxiliary residential and administrative buildings of the Project.[5]

Ongoing license implementation plans at the Project have or will affect resources located within the Prospect Hydroelectric Project historic district. Implementation plans have, over the years, required removal of historic wood flumes (Figure 2), replacement of wood stave pipelines with metal pipelines, removal of the Middle Fork, Red Blanket, and Barr Creek gage shelters, removal of the Middle Fork and North Fork warming sheds, alterations to the Middle Fork canal headgate, and construction of new buildings at both the Middle Fork and Red Blanket dams, among others. As mitigation for effects to historic resources, and in an effort to document changes to the Project over time, PacifiCorp has commissioned numerous documentation efforts conforming to the standards of the Historic American Building Survey/Historic American Engineering Record (HABS/HAER). This report, designed specifically for the PacifiCorp website, compiles a majority of that information.

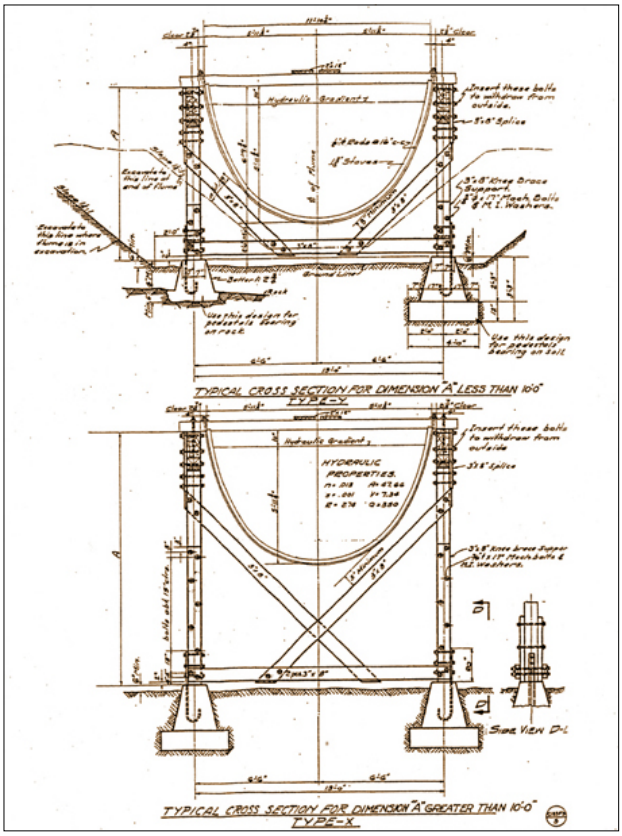

Figure 2. Typical flume cross-section detail for older, no longer extant, flumes. (Image courtesy of PacifiCorp)

Historic Context

With the discovery and development of the John Day mines in the 1850s, gold miners initiated Euro-American settlement of Jackson County, Oregon.[6] Timber companies, farmers, and attendant commercial and residential development followed, and by 1870, homesteaders and timber interests had formed the town of Deskin (later renamed Prospect) on the banks of the Rogue River.

In addition to its location among vast tracts of marketable sugar pine, the community lay on the Old Fort Road, southern Oregon's primary thoroughfare between the mining community of Jacksonville and the U.S. Army's Fort Klamath on the east side of the Cascade Range. Travel on the Old Fort Road was difficult, travelers few, and regional development proved slow and largely limited to scattered ranches, modest tourist facilities (including the extant Prospect Hotel), and logging camps. Marilyn Bailey, in her history of Prospect, described Deskin in the 1880s as "little more than a lumber and tie camp" centered around the Beeson and Slosson shake mill and camp established near Mill Creek Falls. In 1889, early settler and general-store proprietor Stanford Aiken changed the town's name to "Prospect," in anticipation of construction of a Southern Pacific Railroad branch line (never built) and in hope of a prosperous future.[7]

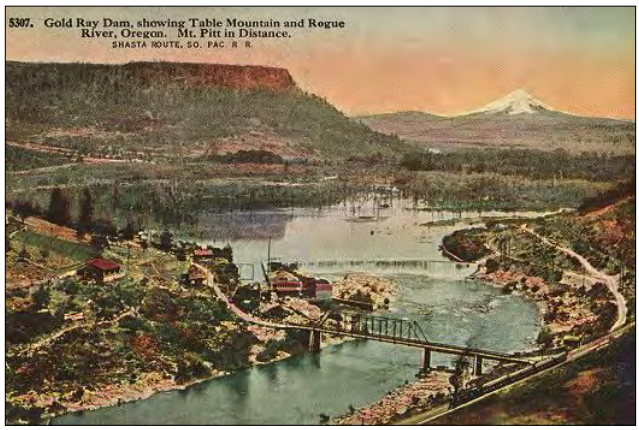

Figure 3. Postcard of Gold Ray dam, depicting Table Mountain, Rogue River, and Mt. Pitt. (Postcard courtesy of PacifiCorp)

In the 1850s, brothers Dr. Charles R. and Col. Frank H. Ray established the Braden Mine and Mill on Gold Hill, now the town of Gold Hill in Jackson County, Oregon. Encouraged by technological advances in hydroelectric power production[8] and frustrated by the cost and limitations of steam power, the Rays incorporated the Condor Water & Power Company and sold bonds to cover the cost of hydroelectric development on the Rogue River.[9] By 1902, they had completed construction of a hydroelectric facility at Gold Ray (Figure 3). Production was substantially augmented in 1911 with construction of the Prospect Hydroelectric Plant (now Prospect No. 1 powerhouse) on the Rogue River. The water conveyance system, powerhouse, and transmission line from Prospect to the Gold Ray plant were also completed in 1911. Prospect not only powered the Ray brothers' milling operation but also provided electricity to the communities of Medford, Jacksonville, Central Point, Grants Pass, and Ashland, Oregon, thereby directly contributing to the region's early twentieth-century agricultural (orchard) boom.[10]

In a 1963 retrospective, the *Medford Tribune* described construction of Condor Water & Power Company's Prospect venture as "a difficult undertaking" involving a forty-three mile equipment haul from Medford to the powerhouse site, a haul completed by three- and four-horse teams and wagons, and terminating in a 200-foot drop, achieved by tram."[11] Prior to construction of the interrelated Prospect Nos. 2, 3, and 4 facilities, water for Prospect No. 1 was diverted from the North Fork of the Rogue River and run via 1.5 miles of canal (abandoned in 1928) to a steel penstock dropping 500 feet to the power plant along the Rogue River.[12]

In 1912, the California Oregon Power Company, better known as COPCO, purchased the Rays' interest in the Prospect plant.[13] By 1921, preliminary studies were being conducted to increase the capacity of the Prospect Development. In 1926,

COPCO initiated construction of a greatly expanded Rogue River hydroelectric system that incorporated the original 1911 Prospect facilities. Byllesby Engineering & Management Corporation assumed responsibility for the design and construction of the new facilities, which included the North Fork diversion dam and pond, 7,000 feet of canal, a forebay, 3,100 feet of wood-stave flowlines and flumes, a surge tank, penstocks, and the Prospect No. 2 powerhouse. A bypass manifold at the surge tank also diverted power to the Prospect No. 1 plant; although the Prospect No. 1 plant was intended to be abandoned upon addition of a third generator at Prospect No. 2, Prospect No. 1 remains in operation to the present day. This system comprised Phase I of the "North Fork Development," which went into service in January 1928 (Figure 4).

Figure 4. Workers utilizing hand tools and wood forms to construct the Red Blanket dam and canal, 1931. (Photo courtesy of PacifiCorp)

The volcanic history of this region remains abundantly evident in the dominant visual presence of the southern Cascade Range, the volcanic waste rock piles that line the canals, and the pumice-littered flotsam at the forebay. This history was equally evident to those charged with design and construction of Prospect No. 1 and the subsequent hydroelectric facilities. Of the Rogue River Valley, COPCO engineer E. C. Koppen wrote:

> "Prior to what might be termed the most important period of volcanic activity in this region, the area now covered by the flat was undoubtedly occupied by a river canyon much deeper than the present one. This old river canyon has since been filled with lava flows and volcanic debris to nearly the present level of the flat areas. The last deposit consisted of a pumice mud flow... 40 to 60 feet deep, or more."[14]

Completion of the first phase of the North Fork Development in January 1928 resulted in considerable local fanfare and laudatory press in the quarterly journal *Power Plant Engineering,* which reported:

> "All supplies and equipment had to be trucked in, a distance of about 45 miles from Medford. Due to soil conditions, trucking except on the surfaced highway was impossible, so that after the right of way was cleared, a narrow gage track was built from the camp up to the diversion dam site. A rock crushing and cement mixing plant was erected at the dam and rock was crushed and concrete for the project, as far as the forebay, was mixed at this plant and distributed on the narrow gage by means of cars and gasoline locomotives. . . . The canal [7000 feet between the diversion dam and forebay] was dug with steam shovels [and] trimmed by hand."[15]

Describing the impact of this construction on the local economy, the *Medford Mail Tribune* reported "there are still persons in the valley who worked on the project [and] remember the period as the most exciting one in the industrial development of Jackson County."[16] Local historian Robert Weiss corroborates this assessment, stating that power companies would "exert considerable influence on the economic structure of Prospect."[17]

Expansion of the existing Prospect facilities and construction of Prospect No. 2 were only the first steps in expanding hydroelectric power production on the Rogue River. Drawings dated October 5, 1921, indicate initial interest in a canal line stretching from the Middle Fork to the North Fork of the

Rogue River.[18] By September 1924, survey crews were actively exploring the area around the Middle and South Forks in anticipation of further expansion for what was being called the South Fork Development, also known as Prospect No. 3.[19] Simultaneously, preliminary geological reports were conducted for regulation, diversion, pondage and storage projects being considered for further expansion of Prospect No. 2.[20] Of the projects considered, only the diversion project, encompassing the South Fork Development and subsequently Prospect No. 3, would ultimately be undertaken.

In an initial Prospect No. 2 planning report, Byllesby engineer P. Crawford described both the original design and construction and plans for subsequent development using water from the Middle Fork, Red Blanket Creek, and the South Fork of the Rogue River:

> "The Company's water right, which dates back to about 1911, was for 400 cfs, but it is proposed to develop the plant for 500 cfs from the North Fork of the Rogue River and about 300 cfs from South and Middle Forks of Rogue River and Red Blanket Creek. . . . By an exchange of property with the Rogue River Timber Company on November 10, 1925, all of the land necessary for the development of Prospect Number Two from the North Fork was obtained, along with a strip of land 500 feet wide, covering all of the Rogue River Timber Company property between the Middle Fork of Rogue River and the North Fork, also a canal right of way between Red Blanket and Mill Creek that simplifies the picking up of the Red Blanket water.
>
> A 15,000 KW unit can be installed in Prospect Number Two without making the diversion from the South Fork [ultimately completed as Prospect Three]. It is proposed to make this installation and continue to operate Prospect Number One by passing water from the new flow conduit [redwood stave flow lines] into the old forebay. [During] a very dry year . . . all of the flow would pass through the new plant . . . When the second 15,000 kw unit is installed, the Middle and South Forks will be diverted to the North Fork.[21]

From June 20 to August 6, 1925, extensive survey work was conducted on the Middle Fork of the Rogue River. A road was constructed to branch off from the main road between Prospect and Butte Falls to approximately one-half mile below (downstream from) the gaging station, as reported by COPCO engineer E. C. Koppen in a 1926 report. Koppen further noted that "in connection with the investigations at Prospect, gaging [sic] stations were established on the Middle Fork and on Mill and Red Blanket Creeks (Figure 5). A Continuous recording clock gage was installed on the Middle Fork and staff gages on Mill and Red Blanket Creeks. . . . The station on the South Fork was established previous to 1925. The gaging stations are visited and maintained by the Company employees at Prospect."[22]

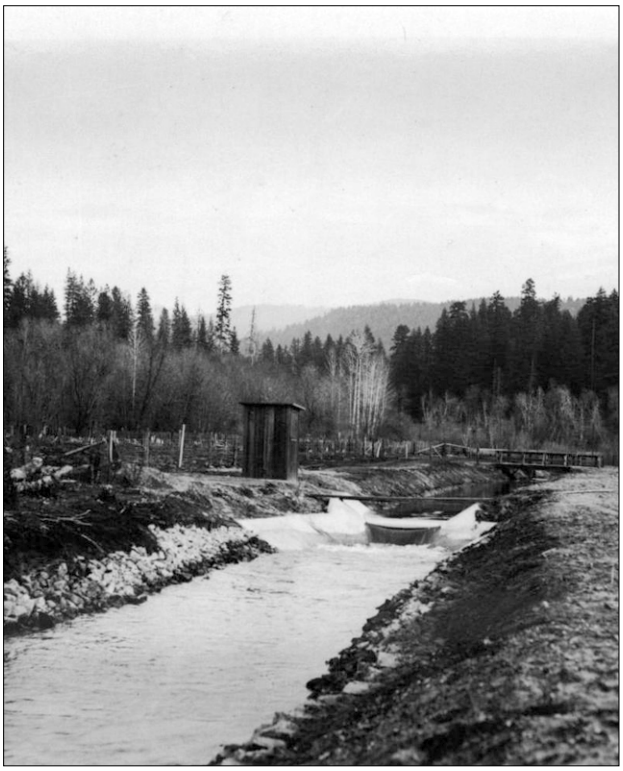

Figure 5. Red Blanket canal and gauge station, 1931. (Photo courtesy of PacifiCorp)

Koppen's report concluded that "the power house location and probably also the location for the dam seems to be definitely fixed at the rock reef, a short distance above the gaging [sic] station."[23] Though a powerhouse on the Middle Fork was never constructed, it must have been considered in conjunction with the regulation, pondage, or storage projects. During these preliminary investigations, Koppen initially "had in mind a dam that would raise the water level about 25 to 30 feet with a concrete section across the stream for the spillway and an earth and rock fill section on the flat area north of the creek. . . . The location of the dam or the height thereof depends on the location and height of the proposed dam on the North Fork; also on the amount of head required for the conduit extending from the Middle Fork to the North Fork. As neither of these were available, no definite location or preliminary layouts were made."[24] Koppen also noted that the 1925 investigations for the South Fork development "consisted mainly of walking over and getting familiar with the ground."[25]

By 1926, construction of the North Fork dam, the Prospect No. 2 powerhouse, and the associated water conveyance system was well underway (Figure 6). In January 1928, the North Fork Development was complete and the Prospect No. 2 powerhouse went into service. During and following construction of the North Fork Development, continued studies were made to "determine the relationship between the several streams or parts of streams that are or ultimately will be tributary to the Prospect No. 2 Plant or the proposed Regulation Project."[26] Concurrently, further surveys for the "Prospect 3-A Development" were being conducted; Prospect 3-A appears to have been a hybrid of what had previously been referred to as Prospect No. 3, the South Fork Development, and/or the Diversion Project. Maps depicting 1926 survey results for Prospect 3-A show both an upper and lower location for dam sites on the Middle Fork, as well as three possible powerhouse and penstock locations for the South Fork.[27]

The role of the gaging stations in determining what developments were ultimately constructed is clearly expressed by Koppen in a March 1929 water supply study of the Rogue River and its tributaries. The stream-flow data contained in Koppen's report was vital, "because we are apparently getting very close to the design and construction of the Diversion, Pondage, and Regulation projects."[28] Koppen's study clearly outlines the relative flows of the streams to be included in the Diversion Project, specifically Red Blanket Creek and the Middle and South Forks of the Rogue River. His findings are based on records of the gaging stations maintained at points along the North Fork of the Rogue River for more than twenty years, as well as those on Red Blanket Creek and the Middle and South Forks of the Rogue River installed in 1924-1925. Koppen's water supply study also noted that as of 1929, no water-flow evaluations had been made for either the pondage or regulation projects.

Figure 6. Prospect No. 2 powerhouse. (Photo courtesy of PacifiCorp)

By 1929, criticisms from fisherman and the irrigation interests regarding water fluctuations downstream from Prospect No. 2 accelerated COPCO's need to regulate the Rogue River to a uniform flow below the Prospect No. 2 plant.[29] At this time, it appears that only two alternatives were considered: the diversion project and the pondage project. As its name suggests, the diversion project provided for "diverting the flow of the Red Blanket and the Middle and South Forks of the Rogue to a point above the diversion on the North Fork for Prospect No. 2."[30] The pondage project, which would have provided pondage at a point approximately four miles above Prospect No. 2, was abandoned in favor of the diversion project.

In 1931, the Prospect Diversion Project (COPCO Project No. 2001) was completed, supplying additional water to the Prospect Nos. 1 and 2 powerhouses by diverting water from the Middle Fork Rogue River and Red Blanket Creek into the Rogue River at the North Fork diversion dam, thereby regulating fluctuations on downstream flows.[31] Both the Red Blanket Creek and Middle Fork diversion dams, and the majority of the extant water conveyance system, date to this period of development (Figure 7).

Prospect No. 3, conveying water from the South Fork to the Middle Fork canal via the Prospect No. 3 powerhouse, came on line in 1933. Both design and construction of the plant was carried out by the engineering and construction department of the Byllesby Engineering & Management Corp. hydraulic engineer J. William Link and electrical engineer A. H. Tracy assumed principal responsibility for project design. George F. Phythian served as superintendent of construction.[32] Today, Prospect No. 3 (FERC Project No. 2337) is regulated separately from Prospect Nos. 1, 2 and 4.

Construction of the Prospect No. 4 facility in 1944 ended a near-complete construction hiatus that extended from the start of the Great Depression through World War II. The unit is operated only at times of sufficient flow, and is supplied by a low head from the steel flow lines by means of a bypass valve at the surge tank manifold. Resources unique to Prospect No. 4 are limited to a powerhouse and a single generator producing 1,000 kw.

In 1979, L. Scott Clay reported "construction of this complex of residences, canal, water tower [surge tank], and the powerhouse at the Prospect Hydroelectric Plant was in direct response to the tremendous growth the Rogue River experienced due to the land promotion and orchard boom, at the beginning of this century."[33] Specifically, COPCO's Prospect facilities played a significant role in the economic development of the Rogue River Valley and are significant at the local level for their association with regional economic and industrial development.[34]

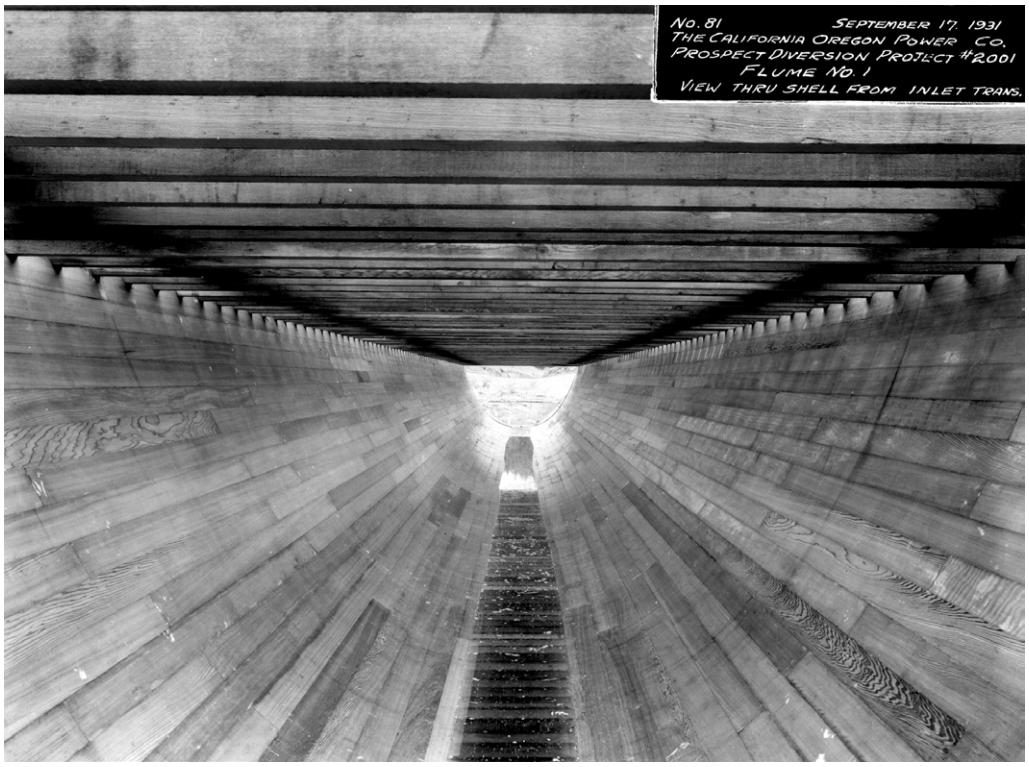

Figure 7. Slideshow of images from the Diversion Project. Click on image to begin. (Photos courtesy of PacifiCorp)

Physical Description of Project Resources

The Project includes components of four different construction campaigns: the Prospect No. 1 Plant, constructed in 1911 by Condor Water and Power Company; Phase 1 of the North Fork Development, constructed from 1926-1928 by COPCO; the Prospect Diversion Project, constructed from 1928-1931 by COPCO; and the Prospect No. 4 powerhouse and associated water conveyance system, constructed in 1944 by COPCO. Additionally, water from the South Fork development, constructed from 1931-1933 by COPCO and regulated as the Prospect No. 3 Hydroelectric Project (FERC Project No. 2337), drains into the Middle Fork canal, a component of the Project's water conveyance system.

During construction of Prospect Nos. 2 and 3, COPCO engineers divided their project budget and construction effort into four distinct categories: the water conveyance system; dams; powerhouses; and auxiliary resources, including a construction plant and housing. This functional classification is adhered to below. Within this classification, resources are described based upon their placement on the river, from upstream to downstream. Since initial construction of the project almost eighty years ago, numerous changes due to maintenance concerns, technological improvements, and other factors have occurred (Figure 8).

Figure 8. Steel flumes, constructed in-kind and on origial concrete footings, replaced original wood flumes. (Photo courtesy of HRA, 2009)

Water Conveyance System

Inverted Siphon

Water from the Prospect No. 3 powerhouse tailrace is conveyed to the Project by means of an inverted siphon. Water discharges from the powerhouse into an open basin, from one side of which a redwood stave pipe siphon carries it across the Middle Fork of the Rogue River to the Middle Fork canal.

Middle Fork Canal and Water Conveyance System

The Middle Fork canal consists of eight miles of open, gunite-lined canal incorporating closed metal pipes and siphons; open, concrete-lined, trapezoidal shaped canals; three raised steel flumes, concrete skimmers/lateral spillways (designed to channel overflow), the Prospect No.2 forebay, and a steel flowline. Historically, the canal included nine raised flumes (no longer extant) as discussed below.

Water that flows through the Middle Fork canal travels approximately 3.5 miles (5.5 km) through a water conveyance system before merging with water from the Red Blanket diversion. The canal capacity increases beneath each diversion dam, from a minimum capacity of 150 cfs at the Middle Fork Diversion Dam, to a maximum capacity of 1050 cfs between the North Fork Diversion Dam and the Prospect No. 1 forebay. For the majority of its length, the canal has a flat bottom, with side slopes of 1:1, and is lined with 6 inches of gunite. Those sections carried on raised flumes over drainages and along steep hillsides are constructed of half-round steel staves (mimicking the historic half-round wood staves).

Red Blanket Water Conveyance System

The Red Blanket canal is an unlined, earthen canal bordered on either side by wooden piles. Historically, the piles supported wooden boards, though these and the piles have mostly deteriorated or rotted away altogether. With the exception of a segment

adjacent to the Red Blanket gage shelter where it is concrete lined, the Red Blanket canal is unlined until approximately 145 feet (44 m) before it merges with the Middle Fork canal. Once the Red Blanket and Middle Fork systems merge, the canal, trapezoidal in shape and concrete-lined, and two steel flumes convey water to a point just upstream from the North Fork diversion dam.

Redwood Flumes (no longer extant; partial replacement with steel)

The redwood flumes were one component of the overall Project. The Middle Fork canal historically contained nine raised flumes. Flume 8 was replaced with a canal after a flume failure in 1964. In 2002, the remaining redwood flumes were removed; three were replaced in-kind with steel and the remaining five were replaced with canals.

Flumes provide water to the steel flowlines and are defined by headwalls that control water velocity and volume. Historically, all the flumes were similar in construction, materials and form. The timber construction varied only to provide compensation for topographic changes and a constant gradient for water movement. Standard structural bent components for the flumes included:

- Legs: the column from the cap to the stringers.
- Stringer: the 8" x 16" beam holding the yolks, running between bents (support columns) and lying parallel to the flow.
- Cap: the 8" x 8" beam running perpendicular to the flow of the flume and from long leg to long leg of each bent.
- Cross Brace: the 3" x 8" bracing for the long legs running parallel or perpendicular to the flow.
- Knee Brace: the 6" x 8" bracing that supports the stringers diagonally from the cap to the underside of the stringer.
- Yoke: the 4" x 6" beams running perpendicular to the flow bearing on top of the stringers.

Original timbers were treated with "Carbolineum" (a liquid mixture of creosotes) before construction, with special attention given to contact points and ends of each timber. All connections between the members were secured with 17-inch bolts installed so they could be removed from outside the structure. Two lengths of 2" x 12" boards were bolted across the yokes to provide a walkway on top of the flume. Length and configuration of cross bracing at each bent varied to compensate for changes in topography. Architectural drawings (No. A35039, Flumes 1-4) indicate that a bent had a typical design width of 13'-0".

Both legs of a bent were stationed atop a cement footing; existing concrete footings were retained and reused during construction of the three replacement steel flumes. The typical base of a footing is 4 feet square and stands 3'- 3" tall. The footings taper toward the soil surface, measuring 14 inches square at the surface. Anchor straps, measuring 4'-0" in length, attach the pedestal to the leg and cap members.

Bents that lined up with creek beds were built onto piers consisting of 3/8 inch rebar cross-wired at 12-inch intervals. These piers extended down to bedrock and were encased in cement. All cement work has ½ inch chamfered edges.

Headwalls were constructed at the beginning and end of each flume and extended at least one foot below grade. All flumes are measured from the inlet headwall to the outlet headwall. The flume intake and outlet transitions were identical structurally. Concrete forms for pouring the headwalls were intended to be used in construction of both intake and outlet transitions. The first and last bent of each flume was spaced closer (11'- 3") to the headwall than the typical spacing between bents (16'-0").

Flume 1 was 278'- 6" in length and ran a tangent line. The flume consisted of seventeen bents, each 13'-0" wide. Two bents (Numbers 11 and 12) were slightly taller and required an elongated cross-bracing system.

Flume 2 ran a straight line of 326'- 6" and had twenty bents, each 13'-0" wide. Bents 14 and 15 covered the tallest spans and had the longer bracing pattern.

At a length of 518'-6", **Flume 3** consisted of 32 bents in 13'-0" widths. This larger straight structure contained only six bents (Numbers 1, and 28-32) that used shorter cross bracing members. Bents 24 and 25 crossed Mill Creek and were set upon piers.

Flume 4 measured 204'- 6" and was constructed of twelve 13'-0" wide bents; all used the shorter cross bracing system. Bents 2 and 3 are spaced 22'-0" apart to span Barr Creek. The additional span between these two bents required a substructure for support. It consisted of 6" x 8" timbers and 1-1/4 inch metal truss rod bolted to the stringers. Along with the typical cut and regrading, Barr Creek was dredged to ensure the creek water would clear the flume. Flume 4 was also fitted with a pipe for draining into Barr Creek. The 12-inch metal pipe was inserted between the bands at the bottom of the wood stave flume and sealed with butyl resin. The drainpipe, supported by a stanchion, directed flow into the creek bed.

Flume 5 was 1,606'- 6" following a straight path. The flume was constructed of 100 bents, each 12'-0" wide, evenly spaced at 16'-0" intervals. Two piers were constructed at bents 71 and 72 to cross Red Blanket Creek, which was dredged and partially backfilled. This flume was elevated and stood at roughly 40 feet. The extended elevation required a tier of longitudinal cross bracing connecting every other bent to the next.

Flume 6 stretched 774'- 6" in a straight path. Forty-seven 12'-0" wide bents made up the body of the flume, which stood approximately 40 feet tall. The flume was divided into three tiers for structural support. The longitudinal cross bracing was constructed of 3" x 8" members bolted to the extended framework, creating a checkerboard effect when viewed in elevation.

Flume 7 was a 454'-6" long arc. Bents were 12'-0" wide and stood approximately 50 feet tall with similar longitudinal cross bracing to Flume 6. The extreme slopes traversed by Flume 7 required additional bracing just above the pedestals on seventeen of the bents.

Flume 9, the longest of the Prospect flumes, ran 2,198'-6" following a shallow S-curve. The flume was constructed of 137 bents (each 9'-6" wide) spaced the typical 16'-0" on center. This extensive structure required major excavations; one cut included almost 700 linear feet of soil 10 feet deep. Most of Flume 9 was low to the ground; only one section measuring less than 100 feet rose to a height of 30'-0".

Prospect No. 2 Forebay

The Prospect No. 2 forebay measures approximately 400 feet square and is 20 feet deep, holding an average of 15-acre feet of water. Two side embankments, made with earth excavated from the forebay, are augmented by gunite corewalls. The pipeline intake from the forebay was built for three lines, ca. 1928, but only two have been installed. The forebay is a structural component of the larger water conveyance system.

Redwood Stave Flowlines (replaced with steel, 2002)

The pair of redwood stave flowlines leading from the forebay to the surge tank measured 3,100 feet in length. Each had an interior diameter of 87 inches. They dropped approximately 150 feet (most realized in the first 1,100 feet below the forebay). The flowlines consisted of redwood staves bound with metal adjusting bands.

In 2002, the flowlines were replaced in-kind with steel (Figure 9). The steel flowlines occupy the same alignment as the original redwood-stave, including the excavated trench approximately 5.5 feet deep with side walls sloped at a ratio of 1.5:1. Within the trench the flowlines are supported on original concrete cradles approximately 4 feet 6 inches in height and spaced 10 feet on center. The flowlines are structural components of the larger water conveyance system.

Surge Tank

The 40-foot tall steel surge tank measures 20 feet in diameter and is connected to both steel flowlines by a cross manifold with 54-inch gate valves. The manifold is housed in a simple gable roofed metal building anchored to the surge tank support columns. The surge tank/manifold is a component of the larger water-conveyance system.

Prospect No. 1 Forebay
This small 1-acre forebay has two earth side embankments excavated from the forebay and is augmented by gunite corewalls. The forebay is a structural component of the larger water conveyance system.

Figure 9. Steel pipes replaced the original wood stave flowlines. (Photo courtesy of HRA, 2009)

Dams

Middle Fork Diversion Dam
The Middle Fork diversion dam is the eastern-most resource. The Middle Fork diversion dam is a low concrete weir with an open spillway, canal intake and fish ladder. The intake has a spillway section and trash racks, and is controlled by means of a Waterman gate. The dam was built of reinforced concrete and completed in 1931.

Red Blanket Diversion Dam
Approximately 2.5 miles northwest of the Middle Fork diversion dam, as the crow flies, is the Red Blanket diversion dam. This dam consists of a low concrete spillway section and an earth embankment. The concrete spillway is constructed of stepped, reinforced concrete and stone. The earthen embankment is approximately 970 feet (296 m) long, aligned southeast to northwest, and enables water to be diverted to the canal intake northwest of the dam. The poured concrete canal intake and lateral spillway are of approximately the same design as the Middle Fork diversion dam, and features a Waterman gate. The dam and canal intake were completed in 1931.

North Fork Diversion Dam
The North Fork Diversion Dam is a low (40-foot), concrete gravity dam with an Ogee spillway section controlled by radial Tainter gates providing a maximum flood discharge of 15,400 cfs (Figure 10). The central concrete portion is 230 feet long. Bulkhead sections extend from the overflow section to earth embankments with gunite core walls terminating at the abutments, providing a total dam length of 400 feet. Flow is controlled by three 34-foot by 12.5-foot Tainter gates, a logway, two 4-foot by 6-foot sluice gates, and the canal intake. The intake is controlled by two 11-foot by 11-foot Tainter gates.

Powerhouses

At present, the Project powerhouses are all supplied via the central water conveyance system described above. The powerhouses are described in order of their placement along this system, from upstream to downstream.

Figure 10. North Fork diversion dam. (Photo courtesy of HRA, 2009)

Prospect No. 4 Powerhouse
The Prospect No. 4 powerhouse, located adjacent to the surge tank and manifold control house, is operated only at times of sufficient flow, and is supplied at a low head from the steel flowlines by means of a bypass valve at the surge tank manifold. It is a one-story square building of brick construction, set on a massive concrete foundation. Windows are metal frame, multi-light. The use of two-tone brick and decorative tile create vertical lines and horizontal banding echoing the design theme used on the earlier Prospect No. 2 buildings (specifically the powerhouse and transformer building). Water conveyed through or past the Prospect No. 4 powerhouse is then conveyed to the Prospect No. 1 forebay (see above) via a short concrete channel.

Prospect No. 2 Powerhouse
The penstocks carrying water from the steel flowlines to the Prospect No. 2 generators are constructed of riveted steel and measure 897 feet 9 inches in length, with a diameter varying from 87 inches at the surge tank to 72 inches at the penstock valve. They are anchored at the midpoint by concrete saddles. Historically, a tramway paralleled this line, providing direct access for maintenance and operation personnel. The tramway was removed in the modern period and all access to the Prospect No. 1 and No. 2 powerhouses is now via a graveled service road.

The Prospect No. 2 powerhouse, the largest on the project, is a 104-foot 9-inch by 67-foot 7-inch by 40-foot 7-inch tall building, constructed of reinforced concrete and steel, with concrete floors and large steel-framed windows (Figure 11). In 1928, shortly after construction, editors of *Power Plant Engineering* described the building as "faced with [a] run of kiln brick, ranging in color from medium buff to dark brown. They are set without regard to color, giving a mottled effect blending in well with the landscape."[35] The interior floorplan is divided into a generator room; a transformer room; and a switchboard room. Interior partition walls are tiled and floors are concrete. The turbines have been replaced during the modern period.

Prospect No. 1 Powerhouse
The single riveted-steel Prospect No. 1 penstock runs from the Prospect No. 1 forebay (see water conveyance system, above) down the steep hillside to the powerhouse, a drop of approximately 500 feet. The large two-story powerhouse is of wood-frame construction, a construction type largely obsolete by the 1920s when powerhouses were most commonly of masonry construction. Although exterior walls have been covered with modern vinyl siding, the massive 10-inch by 10-inch timber framing remains visible on the interior.

Figure 11. The Prospect No. 2 powerhouse (Photo Courtesy of HRA, 2009)

Auxiliary Resources

Middle Fork Warming Shed (removed, 2011)
A small warming shed is located west of and adjacent to the canal intake, nestled between the canal to the east and a steep hillside to the west (Figure 12). Although an exact construction date of the warming shed is unknown, it is assumed (based on

photo documentation) that the warming shed was completed within the first few years of the dam's operations, c. 1933. The Middle Fork warming shed is a single-story, single-bay building. The foundation is partially post-and-pier and partially poured concrete, utilizing the canal intake deck of the Middle Fork dam for the porch floor on the north side. The warming shed is rectangular in plan, with a roughly square interior space to the south and a covered exterior porch on the north elevation. The building has a front-gable roof clad in corrugated metal. The warming shed is clad in horizontal board siding and features a single, four-light wood sash window on the east (canal-side) elevation. The interior is accessed by a wooden door located beneath the porch on the north elevation.

Middle Fork Gage Shelter (removed, 2011)
The Middle Fork diversion dam channels water in one of two ways: either through the canal or via the spillway. Water released through the spillway continues downstream on the Middle Fork of the Rogue River. Approximately 500 feet downstream of the dam on the Middle Fork is the gage shelter. This structure houses equipment that records the flow in the Middle Fork canal. The Middle Fork gage shelter is square in plan, has a poured concrete foundation and a moderately slopping shed roof. The structural system is platform frame (stud wall). The building is clad in original, vertical board siding, and features a single, four-light wood sash window on the west (canal-side) elevation. The interior of the gage shelter is accessed via a narrow wooden door on the south elevation, constructed of the same vertical boards as the siding. The door features an original brass knob and escutcheon. The interior of the building is clad in horizontal board siding. The wooden floor features a central, square well with a gage to measure water flow. The extant Middle Fork gage shelter dates to 1931, as evidence by original blueprints; it is unclear when the first, 1926 Middle Fork gage shelter was moved or to where.

Red Blanket Gage Shelter (removed, 2011)
Approximately 1,112 feet (339 m) downstream of the Red Blanket canal intake is the Red Blanket gage shelter which houses equipment recording Red Blanket canal flow. The Red Blanket gage shelter dates to 1926, is square in plan, and sits on a poured concrete foundation. The building has a moderately slopping shed roof and was constructed in platform frame (stud wall). The building is clad in T1-11 vertical board siding. The interior of the gage house is accessed via a narrow plywood door. The Red Blanket gage shelter has been altered since initial construction and features newer siding that has obscured the original window, located on the canal-side elevation. The original door is no longer extant, and has been replaced with a plywood door.

Figure 12. The Middle Fork warming shed. (Photo courtesy of HRA, 2009)

Barr Creek Gage Shelter (removed, 2011)
Approximately .75 miles (1.16 km) downstream from the confluence of the Middle Fork and Red Blanket canals is the Barr Creek gage shelter. Like both the Red Blanket and Middle Creek gage shelters, the Barr Creek gage shelter is square in plan, sits on a poured concrete foundation, and has a moderately slopping shed roof. The structural system is platform frame (stud wall). The building is clad in T1-11 vertical board siding. The interior of the gage house is accessed via a narrow plywood door. The Barr Creek gage shelter dates to 1926, but has been altered since initial construction. The building features newer siding, which has obscured the original window. The original door is no longer extant, and has been replaced with a plywood door.

North Fork Warming Shed (removed, 2011)
Continuing downstream, the merged Middle Fork and Red Blanket canals divert water to a point upstream of and adjacent to the North Fork diversion dam. On the opposite (west) bank from the canal is the North Fork warming shed, a single-story, single-bay building believed to sit on a poured concrete foundation. The warming shed is rectangular in plan, with a front-gable roof. The warming shed is clad in rolled roofing paper on the south (reservoir-side) elevation, and cedar shingles on the east elevation. The building features a single, four-light wood sash window and vertical board door on the south (reservoir-side) elevation. The interior of the warming shed is clad in horizontal boards and has a wooden floor. The North Fork warming shed was built concurrently with the North Fork dam, completed in 1928. The building is largely intact, though the wall and roof claddings appear to have been altered. The building was used in the winter months as a warming shed for Project staff, though the building has been mostly abandoned in recent years.

Operator's Residential Complex – Middle Fork (removed, 2006)
Until 1982, a maintenance foreman was stationed near the Prospect No. 3 powerhouse, allowing maintenance and surveillance of the upper reaches of the Project and all of Prospect No. 3. The Prospect No. 3 powerhouse was built as a fully automated system, and did not require an operator. This residential complex, containing a small wood-frame house, a detached garage, and a barn (which post-dated the historic period), was eventually abandoned. The complex was removed in 2006.

Main Operators' Village
The Main Operators' Village includes a warehouse (built in 1911, substantially altered in 1985) and modern garages, three historic-era residences (two scheduled for removal in 2011), a barn, four modern residences (built c. 1985), and an assortment of outbuildings including sheds and garages. The substation, switchyard, and a small ancillary building located within the switchyard are considered components of the Operators' Village due to their location. Likewise the surge tank, Prospect No. 1 forebay, and the Prospect No. 4 powerhouse are located adjacent to or within the Operators' Village; these resources are directly affiliated with the water conveyance system.

Construction and Maintenance History

By May 1927, costs were being calculated for the "Middle Fork–Red Blanket Diversion."[36] Preliminary drawings for the Middle Fork dam depict a log diversion dam: a simple, triangular-shaped structure to be constructed of 18" average diameter timbers covered by 3x12" planks, on a bedrock foundation with concrete footings.[37] Accompanying computation sheets show the cost of such a structure to be estimated at $73,750, with additional costs for the flume out of Middle fork ($206,830), the siphon from the flume to the North Fork ($388,860), costs associated with the Red Blanket Diversion ($77,650), and construction of roads and trails ($10,000) bringing the assumed estimated project costs to a subtotal of $757,090.[38]

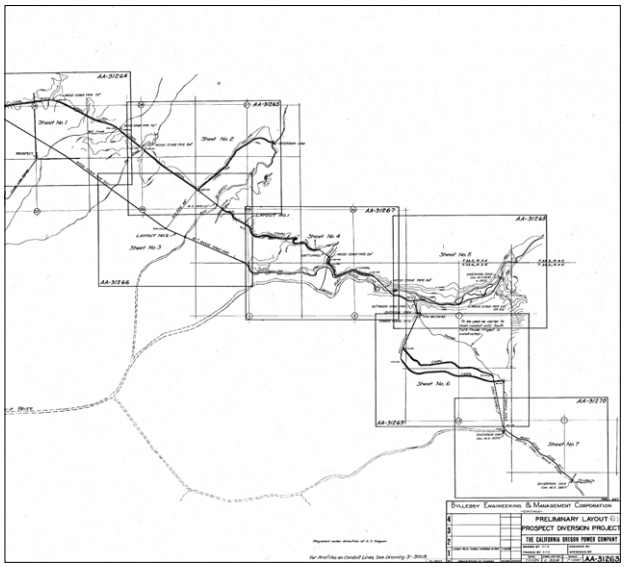

Figure 13. 1929, preliminary layout of the Prospect Diversion Project. (Photo courtesy of PacifiCorp) Click image to see larger view, click again to come back to page.

Early cost calculations show that while various components of the Prospect Diversion Project were being built to include considerations for water diverted from the South Fork diversion dam and Prospect No. 3 powerhouse, cost estimates for the South Fork project were not being calculated in conjunction with the Prospect Diversion Project (Figure 13). Flumes, siphons, and pipelines were engineered to carry South Fork water, but as early as 1927, the South Fork Diversion (now Prospect No. 3) was being thought of as a separate entity in terms of construction costs and estimates. Although the two projects were constructed somewhat simultaneously, COPCO ultimately built and maintained them as separate entities.

It is also important to note that prior to finalizing the design of the Prospect Diversion Project, other projects were still being considered, specifically the pondage, regulation and storage projects, which exist in preliminary concept drawings only and were never finalized or built. However, by September 1929, locations for two dams on the Middle Fork with an associated powerhouse were still being considered.[39]

As calculations, designs, and cost estimates for the Prospect Diversion Project were being finalized, the North Fork diversion dam, warming shed, Prospect No. 2 powerhouse, and miles of associated canals and pipelines were completed. By January 1928, the North Fork diversion was complete, and Prospect No. 2 powerhouse was online. Within two years of the completion of North Fork, construction for the Prospect Diversion Project would be fully underway.

In July 1929, Preliminary Layout No. 3 for the Prospect Diversion Project was produced by Byllesby Engineering & Management Corporation.[40] The drawing appears to be the first look at what would become, more-or-less, the final layout for the Prospect Diversion Project, and includes the contours for the South Fork diversion as well. The combination of wood-stave pipelines, canals, penstocks, and diversion dams are all depicted, though the locations for flumes are not shown.

By July 1931, the location and configuration plans for the Middle Fork diversion dam were complete.[41] Crews began clearing the site shortly thereafter, and

by August 13, 1931, the west bank of the Middle Fork Rogue River was bare except for a few remaining tree stumps in anticipation of construction of the Middle Fork diversion dam (Figure 14).[42] Construction for the Red Blanket dam and canal intake structure, as well as the connecting flumes and canals that would ultimately feed Middle and South Fork and Red Blanket Creek waters to the North Fork diversion, were also underway.

Two camps, one each at Middle Fork and Red Blanket, were established to house workers and staff. Construction continued through fall 1931. Photographs from November of that year depict the Middle Fork dam, intake, and canal largely complete in time for the first snow, though the temporary bridge crossing above the dam was still in place. The canal, as originally constructed, was unlined on the west bank from the intake to a point approximately 200 feet downstream.

Figure 14. The Middle Fork dam and canal, 1931. (Photo courtesy of PacifiCorp)

The Middle Fork warming shed was not built concurrently with the Middle Fork dam; historic photographs show that, while the dam was completed in November 1931, by September 1932, the warming shed had not been constructed.[43] It is assumed that the Middle Fork warming shed was constructed c.1933, within the period of significance of the Prospect Hydroelectric Project historic district.

Historic photographs and original blueprints archived with PacifiCorp do an excellent job of detailing the specifics of construction. Board-forming of the canals, intakes, and dams, construction of trestles for the flumes, grading and moving earth for the Red Blanket dam, placing the concrete canal lining with a Rex Paver, and using a pile driver for the wooden piers flanking the Red Blanket canal were all carefully recorded in large-format photos and negatives. These pictures depict not only the details of the construction of the Prospect Diversion Project but also the men who built it.

In 1953, the first of what would eventually be numerous alterations to the Prospect Diversion Project was necessitated. A partial realignment and construction of a new gunite lined canal was being constructed to replace Flume 8, presumably due to deterioration or failure of the wood and/or ongoing maintenance concerns.[44] Flume 8 was the first flume to be replaced by a canal; by the turn of the twenty-first century, all wooden flumes had been replaced, either with new canal features or with steel flumes in the same size, shape, and configuration as the original timber. Three steel flumes, constructed in-kind to mimic the historic redwood flumes, remain in the Project.

On April 29 1964, the 3,750 kw General Electric generator installed in 1911 at the Prospect No. 1 plant failed and was reported a total loss. The discussion that followed illuminates the role of the Prospect facilities in the local and regional power grid. Pacific Power & Light defined four options: abandon the plant; replace the generator either by repair, in-kind, or a new unit; rebuild the plant completely; or add the third unit at Prospect No. 2. Pacific Power & Light officials determined that regional energy demands [peaking capacity] would not justify expansion of Prospect No. 2 until c. 1980, that abandonment of Prospect No. 1 would require the firm to purchase power from Bonneville Power, and that investment in a new Prospect No. 1 generator could be quickly recouped in the existing market. Officials chose to place Prospect No. 1 back into service as quickly as possible.[45]

The Operators' Village has changed significantly since initial construction of Prospect No. 2 in 1926 (Figure 15). In April 1927, four operators' houses (no longer extant) occupied the west side of the access road. By August of that year, a fifth house was added at the end of the access road on the west side (scheduled for removal). By 1933, the last two operators' houses, one located at the end of the access road on the east side (scheduled for removal) and one fronting Mill Creek Drive, had been constructed. The Operators' Village c. 1933 also included several other buildings including chicken coops, garages and outbuildings, as well as three houses and the 1911 warehouse on the southeast side of Mill Creek Drive.

Early alterations in the Operators' Village included removal of the three houses southeast of Mill Creek Drive. These were removed prior to construction of a 12-man bunkhouse, planned in 1961 and completed by 1964.[46] The bunkhouse was constructed in the Operators' Village southeast of Mill Creek Drive along the access road to the Prospect Nos. 1 and 2 powerhouses. The bunkhouse is T-shaped in plan, has a poured concrete foundation and is clad in T1-11 siding. The building features a side gable roof with projecting front gable entry; the roof is clad in standing seam metal.

Also in the 1960s, one of the 1927 operators' houses on the northwest side of Mill Creek was struck by a truck, causing significant damage.[47] Though the date of demolition of this house is unknown, it is assumed that the house was removed shortly after the accident. In 1971, Pacific Power & Light Company sold another of the Operators' houses, "house #7811 located at Prospect No. 2 Operators' Village[,] to Harold and Lavina Hixon."[48] As part of the sale agreement, the Hixon's were required to "remove said dwelling from the property not later than August 1, 1971."[49] Of the remaining five houses, two were removed at an unknown date, one is currently occupied (the house fronting Mill Creek Drive), and two have been vacant for years and are scheduled for removal.

Other alterations to the Operators' Village include construction of a large equipment storage and welding shed in 1970.[50] Three modern houses were constructed in the Operators' Village c. 1985; a fourth house was also constructed at that time east of the steel flowlines. Additional changes in the 1980s included a complete remodel of the 1911 warehouse, which was altered to such an extent that it is not considered a contributing resource to the Prospect Nos. 1, 2 and 4 historic district.[51] Other garage buildings were added c. 2000.

Figure 15. Two remaining houses of the Prospect Operators' Village. (Photo courtesy of HRA, 2009)

On July 24 1995, approximately 40 linear feet of the 1,600 foot-long elevated Flume 5 failed. The repair work order specified salvage and reuse of the undamaged concrete foundations; replacement of damaged concrete footings; replacement in kind of bent timber supports and associated lateral bracing; and replacement in kind of approximately 65 linear feet of half-round timber flume. Deviations from the historic design were limited to installation of a trial hypalon liner on the interior of the new flume section (to reduce algae growth and commensurate loss of canal capacity) and the use of two, rather than one, legs in the diagonal bracing (to increase structural strength). After commending PacifiCorp for the "care and attention used in repair of the unique resource," the Oregon SHPO determined that the repair would, conditional to use of in-kind materials, have "no adverse effect" upon the historic character of the flume and associated canal.

Other alterations to the Project have been necessitated by FERC in accordance with license implementation, health and life-safety concerns, and innovations in hydroelectric power production.

Alterations include relining original concrete canals and replacing wood-stave flowlines with steel flowlines of the same size, shape, and configuration (Figure 16). Pending alterations include removal of the Middle Fork, Red Blanket, and Barr Creek gage stations, which will be upgraded with new gaging technology; removal of the Middle Fork warming shed to enable installation of an automated system in a new structure at the Middle Fork canal intake; installation of a new structure for automation at the Red Blanket canal intake of the same size and shape as the Middle Fork automation structure (Figure 17); installation of a flow release structure on the Red Blanket dam; and removal of the now deteriorated and unused North Fork warming shed.

Resources associated with construction, including rail lines, concrete mixing plants, aggregate-crushing plants, and workmen's housing, were designed to be temporary and are no longer extant.

Figure 16 (top). When the original wood flume failed, this new flume was constructed out of steel in the same size, shape, scale, and location. (Photo courtesy of HRA, 2009)

Figure 17 (bottom). The Red Blanket canal intake will be modified to allow for automation. (Photo courtesy of HRA, 2009)

Notes

1. The NRHP is the official list of the Nation's historic places worthy of preservation (http://www.nps.gov/history/nr/).

2. PacifiCorp, "Historic Properties Management Plan for Prospect Nos. 1, 2, and 4 Hydroelectric Project Relicensing, FERC Project No. 2630," May 2005, p. 1, PacifiCorp Headquarters.

3. Ibid.; and PacifiCorp, "Historic Resource Inventory & Assessment Report: Prospect Nos. 1, 2, and 4 Hydroelectric Project Relicensing, FERC Project No. 2630," 2003, PacifiCorp Headquarters.

4. PacifiCorp, "Historic Resource Inventory & Assessment Report: Prospect Nos. 1, 2, and 4 Hydroelectric Project Relicensing, FERC Project No. 2630," 2003.

5. The South Fork dam, Prospect No. 3 powerhouse, and associated water conveyance features, known collectively as the Prospect No. 3 Hydroelectric Project ([FERC Project No. 2337), were constructed concurrent with the Prospect Diversion Project (i.e. the Middle Fork and Red Blanket dams and associated water conveyance system). However, these resources are regulated under separate license from Prospect Nos. 1, 2, and 4. With the exception of where information is included in developing the historic context for the Prospect Diversion Project, Prospect No. 3 resources are not included in this report.

6. Joy B. Dunn, ed., Land in Common. An Illustrated History of Jackson County, Oregon (Medford, Oregon: Southern Oregon Historical Society, 1993), p. 85.

7. Marilyn Baily, "The Prospect Area Between 1870 and 1920" (December 10, 1958), Southern Oregon Historical Society, Medford, Oregon, pp. 6-7.

8. Hydroelectric power development in the Pacific Northwest depended upon significant technological advances, including development of the large capacity hydroturbogenerator (1895); advances in power transmission (1891–1900); and development of the free jet tangential impulse, or "Pelton," turbine (c. 1900). All three advances were employed at Prospect No. 1 and subsequent developments. See Lisa Soderberg, "Hydroelectric Power Plants in Washington State, 1890–1938," National Register of Historic Places Multiple Property Documentation Form, 1988, Washington Department of Archaeology and Historic Preservation (DAHP), Olympia, Washington.

9. In 1907, Condor Water and Power reorganized as Rogue River Electric. In 1913, Rogue River Electric merged with northern California's Siskiyou Light and Power, creating the California Oregon Power Company (COPCO). In 1961, COPCO merged with Pacific Power and Light, predecessor of PacifiCorp. John Dierdorff, How Edison's Lamp Helped Light the West: The Story of Pacific Power & Light Company and Its Pioneer Forebears (Portland, Ore.: Pacific Power & Light Company, 1971).

10. PacifiCorp, "Historic Properties Management Plan for Prospect Nos. 1, 2, and 4," May 2005, p. 7.

11. Eva Hamilton, "The Light House," Medford (Oregon) Mail Tribune (September 1, 1963).

12. P. O. Crawford to E. Uhlendor, May 5, 1926, File: Misc. Reports/Studies, Box 26349, PacifiCorp Archives, p. 3.

13. "Col. F. H. Ray, Well Known Locally, Passes in East," Medford Mail Tribune, April 13, 1925, p. 5, as quoted in Southern Oregon History, Revised, "Co. Frank H. and Dr. Charles R. Ray," http://id.mind.net/~truwe/tina/rays.html (accessed September 23, 2010).

14. E. C. Koppen, "Pondage Project North Fork of Rogue River," November 1929, File: "From the files of COPCO," Box 26316, PacifiCorp Archives.

15. Anonymous, "Prospect No. 2 Hydro Plan," Power Plant Engineering, Vol. 32, No. 7 (April 1, 1928): pp. 393-394.

16. Hamilton, "The Light House."

17. Robert M. Weiss, Prospect. Portrait of an Upper Rogue Community (Eagle Point, Oregon: Laurelhurst Publications, 1989), p. 25.

18. "Preliminary Prospect Development Middle Fork Canal Line," Drawing PP No. G-60102, California Oregon Power Company, October 5, 1921, P8 Electronic Archives, PacifiCorp Headquarters.

19. John F. Partridge and R. G. Hackett, "Report on Reconnaissance and Preliminary Survey: South and Middle Forks, Rogue River, Prospect No. 3 Development," California Oregon Power Company, January 1925, PDX.014994, Rogue Development Prospect Project Unlicensed Plant Data 1926-1962, Box 30936, PacifiCorp Headquarters Archives.

20. Map of Regulation, Diversion, Pondage, and Storage Projects being considered for Prospect No. 2, 1925, PDX.008386 Hydro – Rouge River Geologic / North Umpqua Repairs – Reports, Box 26316, PacifiCorp Headquarters Archives.

21. P. O. Crawford to E. Uhlendor, May 5, 1926, File: Misc. Reports/Studies, Box 26349, PacifiCorp Archives, p. 3.

22. E. C. Koppen, "Preliminary Surveys and Investigations, Prospect No. 3 Development (Part on Middle Fork of Rogue River), California Oregon Power Company, May 24, 1925, p. 1, PDX.014994 Rogue Development Prospect Project Unlicensed Plant Data 1926-1962, Box 30936, PacifiCorp Headquarters Archives.

23. Ibid., p. 2.

24. Ibid.

25. Ibid.

26. E. C. Koppen, "Water Supply Study: Rogue River and Tributaries, Prospect Developments," California Oregon Power Company, March 25, 1929, p. 1, PDX.008386 Hydro – Rouge River Geologic / North Umpqua Repairs – Reports, Box 26316, PacifiCorp Headquarters Archives.

27. "Prospect 3-A Development Middle Fk. Rogue River, Jackson Co. ORE., T. 32 & 33S, R.4E., W.M., Key Map – Preliminary Survey of 1926," Drawing F-4693, California Oregon Power Company, February 7, 1928, P8 Electronic Archives, PacifiCorp Headquarters.

28. Koppen, "Water Supply Study: Rogue River and Tributaries," March 25, 1929 p. 1.

29. E. C. Koppen, "Regulation Project Rogue River," June 1929, PDX.008386, Box 26316, Hydro-Rogue River Geologic/ North Umpqua Repairs-Reports, 1927-1982, Folder: 534.07, Prospect Development NO 3-A, D. G. MacBean's Report of the Middle Fork of Rogue River – 1928, p. 2, PacifiCorp Headquarters Archives.

30. Koppen, "Regulation Project Rogue River," June 1929, p. 2.

31. The Prospect No. 3 project, which conveys water from the South Fork Rogue River to the Middle Fork canal via the Prospect No. 3 powerhouse, was also built as part of the Prospect Diversion Project. Prospect No. 3 came on-line in 1933, operates under separate FERC license (FERC Project No. 2337), and will not be affected by the proposed project.

32. Anonymous, "Prospect No. 2 Hydro Plan," Power Plant Engineering, Vol. 32, No. 7 (April 1, 1928): p. 395.

33. L. Scott Clay, "State of Oregon Inventory of Historic Properties: Prospect Hydroelectric Plant" (April 17, 1979), on file at State Historic Preservation Office, Salem, Oregon.

34. Massive federal hydroelectric projects came on line in the Pacific Northwest during the period of significance assigned the Prospect facilities, 1911-1933. Prospect's contribution to the overall regional power supply was negligible. Its historical significance is therefore local.

35. Anonymous, "Prospect No. 2 Hydro Plant," p. 393.

36. J. F. Partridge and H. P. Bosworth, Jr., "Cost of Middle Fork-Red Blanket Diversion," May 17, 1927, PDX.008386 Hydro – Rouge River Geologic / North Umpqua Repairs – Reports, Box 26316, Folder: Middle Fork-Red Blanket Diversion Prospect No. 2, PacifiCorp Headquarters Archives.

37. J. F. P., "Cross Section and Profile of Log Diversion Dam, Middle Fork of Rogue River," May 1, 1927, PDX.008386 Hydro – Rouge River Geologic / North Umpqua Repairs – Reports, Box 26316, Folder: Middle Fork-Red Blanket Diversion Prospect No. 2. PacifiCorp Headquarter Archives.

38. J. F. P., "Summary, Estimated Cost, Middle Fork and Red Blanket Diversion (with capacity in conduits to include South Fork)," July 23, 1927, PDX.008386 Hydro – Rouge River Geologic / North Umpqua Repairs – Reports, Box 26316, Folder: Middle Fork-Red Blanket Diversion Prospect No. 2. PacifiCorp Headquarter Archives.

39. Byllesby Engineering & Management Corporation, "Dam Sites on Middle and South Forks, Prospect Diversion Project," Drawing AA-31271, California Oregon Power Company, P8 Electronic Archives, PacifiCorp Headquarters.

40. Byllesby Engineering & Management Corporation, "Preliminary Layout No. 3, Prospect Diversion Project," Drawing AA-31263, California Oregon Power Company, July 25, 1929, P8 Electronic Archives, PacifiCorp Headquarters.

41. Byllesby Engineering & Management Corporation, "Location of Diversion Dam on Middle Fork of Rogue River," Drawing B-35151, California Oregon Power Company, July 25, 1929, P8 Electronic Archives, PacifiCorp Headquarters.

42. California Oregon Power Co. Prospect Diversion Project No. 2001, Middle Fork Dam Site – View from S.E. end of dam along [centerline] of Dam, Photo No. 38, August 13, 1931, PDX.025375 Prospect No. 3 Construction Photos, PacifiCorp Headquarters Archives.

43. Photo No. 239, Middle Fork Dam and Canal Intake View Looking Upstream, September 13, 1932, PDX.025375, Hydro Generation, PacifiCorp Headquarters Archives.

44. T. R. Lytle, E. B. Hedberg and E. E. Stearns, "Prospect Middle Fork Diversion Project, 1953 Partial Realignment," Drawing F-7314, California Oregon Power Company, March 26, 1953. P8 Electronic Archives, PacifiCorp Headquarters.

45. A. E. Alspaugh to George L. Beard, "Generator Failure at Prospect 1 Plant" (May 27, 1964), File "General Correspondence, Central Files," Box 03957, PacifiCorp Archives.

46. PacifiCorp Headquarter Archives, Portland, Oregon, Box PDX.026971, Folder OR-132-A1, Rouge River Projects, Prospect, 12-Man Bunkhouse.

47. Prospect Nos. 1, 2 and 3 Hydroelectric Project Photos, PacifiCorp Headquarters Archives, Portland, Oregon.

48. Francis Kent, Pacific Power & Light Co. memorandum to Keene Atwood, "Sale of House #7811 located at Prospect No. 2 Operators' Village," April 2, 1971. Box PDX.026971, Folder OR-132-A4, Rouge River Projects, Prospect #2 Plant, Operators' Village, Sale of House #7811, PacifiCorp Headquarters Archives, Portland, Oregon.

49. Sale Agreement, p. 1. Box PDX.026971, Folder OR-132-A4, Rouge River Projects, Prospect #2 Plant, Operators' Village, Sale of House #7811, PacifiCorp Headquarters Archives, Portland, Oregon.

50. Pacific Power and Light Company, preliminary drawing for "Equipment Storage and Welding Shed," July 27, 1970. PacifiCorp Headquarter Archives, Portland, Oregon, Box PDX.026971, Folder OR-132-A1, Rouge River Projects, Prospect, 12-Man Bunkhouse.

51. PacifiCorp, "Historic Resource Inventory & Assessment Report: Prospect Nos. 1, 2, and 4 Hydroelectric Project Relicensing, FERC Project No. 2630," 2003.

References Cited

Anonymous, "Facts about COPCO" (December 15, 1949), Southern Oregon Historical Society, Medford, Oregon.

Anonymous, "Prospect No. 2 Hydro Plant," *Power Plant Engineering,* Vol. 32, No. 7, April 1, 1928.

Anonymous, "Prospect Diversion Project with 7200-Kw. Hydroelectric Plant," *Power Plant Engineering,* Vol. 36, No. 6, March 15, 1932.

Baily, Marilyn, "The Prospect Area Between 1870 and 1920," December 10, 1958. On file at Southern Oregon Historical Society, Medford, Oregon.

Bates, Lance. Oral Interview (June 14, 2000).

Boyle, John C., *50 Years on the Klamath.* Medford, Oregon: Klocker Printery, 1976.
Clay, L. Scott. "State of Oregon Inventory of Historic Properties: Prospect Hydroelectric Plant" (April 17, 1979), on file at State Historic Preservation Office, Salem, Oregon.

Dierdorff, John. *How Edison's Lamp Helped Light the West: The Story of Pacific Power & Light Company and Its Pioneer Forebears.* Portland, Oregon: Pacific Power & Light Company, 1971.

Dunn, Joy B., editor. Land in Common. *An Illustrated History of Jackson County, Oregon.* Medford, Oregon: Southern Oregon Historical Society, 1993.

Energy Planning Associates and Parsons Brinckerhoff Quade & Douglas Inc. "Application for License Before the Federal Energy Regulatory Commission: Fremont Power Project FERC No. 6628." Submitted by Waterfall Electric Co., November 1984.

Hall, Michael, Deschutes County Community Development Department. *Irrigation Development in Oregon's Upper Deschutes River Basin 1871-1957. A Historic Context Statement.* Prepared for Deschutes County, the Cities of Bend, Redmond and Sisters, and the State Historic Preservation Office, 1994.

Hamilton, Eva. "The Light House," *Medford (Oregon) Mail Tribune* (September 1, 1963).

Olsen, Harry. "Problems in Water Conveyance," Electrical West, June 1934.
PacifiCorp. "Final Technical Report. Yale Hydroelectric Project, FERC Project No. 2071." On file at PacifiCorp, Portland, Oregon, April, 1999.

Pacific Power and Light Company. "Prospect No. 3 Hydroelectric Project, FERC Project No. 2337-001 – Oregon; Application for New License, Volume I." On file at PacifiCorp,
Portland, Oregon, December 20, 1985.

PacifiCorp Headquarters Archives, Portland, Oregon. P8 Electronic Archives, PacifiCorp Headquarters, Portland, Oregon.

PacifiCorp. "Historic Resource Inventory & Assessment Report: Prospect Nos. 1, 2, and 4 Hydroelectric Project Relicensing, FERC Project No. 2630 2003. PacifiCorp Headquarters Archives.

------. Historic Properties Management Plan for Prospect Nos. 1, 2, and 4 (FERC Project No. 2630). May 2005. PacifiCorp Headquarters Archives.

Soderberg, Lisa. "Hydroelectric Power Plants in Washington State, 1890-1938." National Register of Historic Places Multiple Property Documentation Form on file at the Washington State Historic Preservation Office, Olympia, Washington, 1988.

Taylor, George V., compiler. "A General History by Years of the California Oregon Power Company and its Predecessors in the Electric Industry in Southern Oregon and Northern California." On file at Southern Oregon Historical Society, Medford, Oregon, no date [c. 1964].

The Volt (Medford,Oregon: California Oregon Power Company), Vol. 6, No. 3 (November 1926).

Weiss, Robert M. *Prospect. Portrait of an Upper Rogue Community.* Eagle Point,Oregon: Laurelhurst Publications, 1989.

Work, Robert G. "An Early History of the Upper Rogue." MS Thesis on file at Southern Oregon Historical Society, Medford, Oregon, 1958.

ARCHIVAL COLLECTIONS:
Southern Oregon Historical Society, Medford, Oregon.
PacifiCorp, Portland, Oregon.

AA-31263

AA-31264

AA-31265

AA-31266

AA-31267

AA-31268

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Sheet No. 1

Sheet No. 2

Sheet No. 3

Sheet No. 4

Sheet No. 5

Sheet No. 6

Sheet No. 7

DIVERSION DAM
PROSPECT NO. 2
Elev. W.S. 2591

FOREBAY
Elev. W.S. 2591.5

PROSPECT NO. 2
PLANT NO. 2

PROSPECT NO. 2
PLANT NO. 1

CANAL PROSPECT NO. 2

PROSPECT

SPILLWAY

NORTH FORK ROGUE RIVER

MIDDLE FORK ROGUE RIVER

WOOD STAVE PIPE 72"

WOOD STAVE PIPE 84"

WOOD STAVE PIPE 96"

W.S. PIPE 66"

W.S. PIPE 48"

81" WOOD STAVE PIPE

LAYOUT NO. 1

LAYOUT NO. 2

600' TUNNEL

CANAL

Mill Creek

Cobb Lake Ditch

Red Blanket Creek

DIVERSION DAM

Elev. W.S. 2642

POWER HOUSE SITE

PENSTOCK

To be used as carrier to main conduit until South Fork Power Project is constructed.

Daniels Creek

2300' TUNNEL

DIVERSION DAM
Elev. W.S. 3220

WOOD STAVE SOUTH FORK ROGUE RIVER PIPE 60"

DIVERSION DAM
Elev. W.S. 3363

Irrigation Ditch

T. 32 S. R. 3 E.
T. 33 S., R. 3 E.

T. 32 S. R. 4 E.
T. 33 S., R. 4 E.

Prepared under direction of E. C. Keppen

For Profiles on Conduit Lines, See Drawing S-5019

G-5017

PRO. 657

BYLLESBY ENGINEERING & MANAGEMENT CORPORATION
-CHICAGO-

PRELIMINARY LAYOUT No. 3
PROSPECT DIVERSION PROJECT
THE CALIFORNIA OREGON POWER COMPANY

NO.	DESCRIPTION OF CHANGE	CHECKED	APPROVED
4			
3			
2			
1	LAYOUT NO. 2 - CANAL CHANGED TO PIPE 7-29-29		

DRAWN BY R.F.N. | CHECKED BY
TRACED BY R.F.N. | APPROVED BY

DATE	DWG. LIST NO.	SCALE
7/25/29	C-5018	1"-1000'

AA-31263