

MEMORANDUM

May 18, 1928.

Subject: Comprehensive survey, -conference with Mr. Parker, May 16-17, 1928.

SKAGIT RIVER AND ITS TRIBUTARIES.

Reservoir on Sauk River. Lower Sauk site located a short distance above its mouth. Has capacity of 500,000 acre feet. No cross-sections available, but have U.S. Geological Survey report, of which Mr. Parker has one copy.

The Sauk near Whitechuck, probably above the Whitechuck, has capacity of 88,000 acre feet. The American Nitrogen Products Company has made more or less detailed survey here. Their Engineer was Nicolai Aall. Dean Landes acted as consulting Geologist in this investigation. There are two probable sites in this general vicinity. Mr. Parker has detailed topography and records of test Pit explorations.

Lower North Fork of the Sauk has also been investigated by the American Nitrogen Products Company at a site about 5 miles up from the mouth. Mr. Parker has crosssections and records of drilling. Dean Landes may have copy of his report on this site.

Upper North Fork. Mr. Parker has topography and test pit reports.

MAIN SKAGIT RIVER.

Faber dam sites Nos. 1 and 2. Below mouth of Sauk a 300 foot dam would back water up to the Gorge plant of the City of Seattle, and a 200 foot dam would give 1,700,000 acre feet of storage, which, if 600,000 acre feet were kept for flood control, would keep all ordinary floods down to 100,000 second feet on main river. Both of these sites are near the Faber ferry. Mr. Parker has cross-sections and geological reports, together with area and capacity curves. Make field investigations to determine feasibility of dam at both of these sites and if a good dam site is found, reservoir surveys should be made.

The Dalles on the Skagit River. A site for a low head dam, which would back the water up to the tailwater of Baker River plant. Mr. Parker has suggested that in order to gain additional head, the water might be lead from this dam through a tunnel to a power plant near the mouth of Finney Cree

An earth fill dam could be built at Hamilton provided floods could be controlled so as not to exceed 100,000 second feet, this requirement being necessary on account of lack of necessary spillway capacity.

The various dams proposed and under construction by the City of Seattle are matters of more or less general knowledge. However, in connection with the Ruby Dam, Mr. Parker says that by raising the elevation of water 35 feet above the elevation of water at the international boundry they can get complete regulation of the upper river, and with this in view the City is making unofficial negotiations with the Canadian authorities, and if any satisfactory basis for this development can be determined by

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these officials, the matter will be taken up directly through the State Department for final adjustment.

Cascade River. Mr. Parker has some topography and a small amount of data on this site.

Thunder Creek. Diablo Dam will back water up Thunder Creek about 6 miles. The Geological Survey has levels up the Skagit as far as the international boundry but no levels at all up Thunder Creek. Mr. Parker says the Forestry Service has a map of the upper Skagit which will prove valuable in our work and that we should obtain a copy of it. There is a small reservoir probable on this creek. Stirling B. Hill made a field reconnaisance and Mr. Parker has a copy of his report.

County Line Site on the Skagit will back water up to Gorge plant. No data worked up on this site as yet.

The Newhalem Creek Site has already been developed by the City.

The Beaver Creek has small storage but will be drowned out by Ruby dam so this should probably not be considered.

The Sulphur Creek Site on the Baker has been investigated by the Puget Sound Power and Light but they have found an old river bed on one side of the channel which makes it doubtful whether a dam of sufficient height could be constructed here.

EXISTING GAGES ON THE SKAGIT AND TRIBUTARIES

1. The Dalles - installed by Skagit County. A very good station with cable and recording instrument.
2. Gorge plant - City of Seattle.
3. Thunder Creek.
4. Ruby Dam Site.

The following gages should be installed in the order given:

1. At lower Sauk Dam Site. Base station.
2. Cascade River. Base station. Be constructed at this time of cedar, and make sufficiently large to allow space for concrete structure to be built inside later on. Methods of construction will depend upon available roads.
3. Sauk above Whitechuck. Base station.
4. Sauk near Darrington. Tertiary station.
5. Skagit above the Sauk. Base station. Necessary for flood control but not for power development. Could be located any where between Rockport and Marblemount.

- 6. Suiattle above Downey Creek. Secondary station.
- 7. Secondary station on the North Fork of the Sauk.
- 8. Whitechuck 5 miles above its mouth. Secondary station.

Proposed gages under present allotment.

Available for Skagit River - \$14,000.

| | <u>Construction</u> | <u>Maintenance</u> |
|-------------------------------|---------------------|--------------------|
| 1. Lower Sauk..... | \$2300 | \$500 |
| 2. Cascade | 1800 | 500 |
| 3. Sauk above Whitechuck..... | 2100 | 500 |
| 4. Sauk above Darrington..... | 500 | - |

Puyallup - White, available \$5,000.

- 1. White River near Boise at the foot of Hebb site near Mud Mountain..... 2300 600

After discussion on the Grand Coulee gage for the Columbia River, a suggestion was made that this gage be eliminated in order to provide additional funds for the Grand Coulee Gage, but the matter was left open for further consideration.

Stilaguamish - available \$7,000.

- 1. A base station on the south fork above Canyon Creek near Granite Falls..... 2100 500
- 2. A cedar base station on the north fork near Oso dam site..... 1400 500

The Robe and Tyree power sites on this stream are covered by Geological Survey reports which can be obtained from Mr. Parker.

Chehalis River - available \$5,000.

Probably no power possibilities on this stream but some storage for flood control is possible.

- 1. A base gaging station near Grandmound... 2400 600

Snohomish - available \$7,000.

The Tolt River should be surveyed. Have a gage now below Snoqualmie Falls. The Geological Survey have a tentative plan worked out for proposed power sites on this stream, and have thus arrived at a knowledge of what data are lacking. Gaging station to be established.

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- 1. Base station on the Skykomish near Monroe 2300 000

Construction Maintenance

| | | | |
|----|--|--------|-------|
| 2. | On the Tolt as near mouth as possible as it looks like there is a reservoir site above here..... | \$1400 | \$600 |
|----|--|--------|-------|

Columbia River - Available \$27,000.

The following gages should be established in the order shown:

- | | | | |
|----|--|------|-----|
| 1. | Clark Fork below mouth of Priest River. A timber structure large enough to make forms inside for concrete structure later on..... | 2500 | 500 |
| 2. | Hungry Horse on the South Fork of the Flathead River. It is to be hoped that the Reclamation Service will put this gage in, but included here for the present because of its importance..... | 2300 | 600 |
| 3. | Grand Coulee. Install staff gage now with cable gaging station. Make recording gage installation later on if funds permit..... | 3500 | 500 |
| 4. | Clark Fork at Heron. A detailed estimate has already been prepared. See Seattle File 1144.12/325. This is a secondary station of cedar..... | 2500 | 500 |

The Northern Pacific Railway owns the Cabinet Rapids site below this proposed gage, which if developed would drown out this gage. If a cedar installation is made at this time they would probably put in a similar gage in its place so Mr. Parker thinks provision should be made for concrete station here if possible.

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|----|--------------------------------|------|-----|
| 5. | Clark Fork near St. Regis..... | 2300 | 500 |
| 6. | Priest River near mouth..... | 2100 | 500 |

Total of these 6 stations 15,200 3,100

If necessary numbers 5 and 6 may be omitted in the work under the present allotment.

On the Kootenai on our side of the line we have everything we need, but should have a gage on the Kootenai in Canada above its junction with the Columbia near Nelson, B.C.

Nos. 52 and 53 of Col. Barden's report are already in. Item 7 of paragraph

16 of Colonel Barden's report, will be covered by Geological Survey for the State Department.

Mr. Parker says that there is a possible reservoir site on one or the other of the North or Middle Forks of the Flathead and thinks there is a Geological Survey quadrangle survey sheet covering the area involved. Extensive reconnaissance should be made on both the North and the Middle Forks. They form one boundary of Glacial National Park, and any reservoir site on them would have to be regulated to high water during the tourist season as on the Chelan. Mr. Herzog of the Great Northern Railway has made some power investigation on both of these forks. If the Rocky Mountain Power Company is granted its preliminary permit and license, they should be required to establish recording gages at Polson and one at Somers on the lake and a 15 year cedar station below the upper power house. Also one below the lowest dam site to get a relation between these two gages before the 15 year station is drowned out by development of the next power site down stream.

The Okanogan River has comparatively little power on it, but as a matter of interest Mr. Parker states that Okanogan Lake in Canada is regulated for navigation and this might have some bearing upon possible developments on the river.

Mr. Parker thought we should consider the Wenatchee River, but it was pointed out that Colonel Barden purposely omitted it from his original report because whatever storage could be developed on it would not materially affect navigation on the Columbia.

The Similkameen River will be taken care of by the joint boundary work as on the Kootenai by the Geological Survey for the State Department.