

HISTORICAL RECORD OF DAM BUILDING AND THEIR  
IMPACTS ON FLOODS OF THE SKAGIT RIVER

SKAGIT COUNTY, WASHINGTON

1924 THROUGH 1968

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### PREFACE

This paper is the second of a series of papers that will be prepared regarding issues concerning the history of the Skagit River floods and other issues as well. Ninety eight percent of the verbiage contained herein comes directly from historical newspaper articles gleaned from a project that began in July 2004, when Skagit County Public Information Officer, Dan Berentson, contacted me and asked if I would like to help him review all the old articles of the Skagit Argus. I and my son Josef, jumped at the opportunity. We had barely began the project when we all realized that this was an opportunity to preserve the past for use in the present and future generations of our valley and we expanded the project to include not only the Argus, but the Burlington Journal, the Courier Times and the Skagit Valley Herald.

It was originally planned to just concentrate on flood events themselves, however we quickly realized that this was an opportunity to preserve the written record of the history of our valley on many issues. Three hard copy books have been published and are available in local libraries and from the Skagit County Public Works Department containing the hard copy articles mentioned herein. The individual articles are also accessible by clicking on the PDF versions in this paper as well as the following two web sites: [www.skagitriverhistory.com](http://www.skagitriverhistory.com) and [http://www.skagitcounty.net/Common/Asp/Default.asp?d=PublicWorksSalmonRestoration&c=General&p=HistoricIndex.htm#\\_ftnref1](http://www.skagitcounty.net/Common/Asp/Default.asp?d=PublicWorksSalmonRestoration&c=General&p=HistoricIndex.htm#_ftnref1). Neither Dan nor I benefit in any monetary gain for this project.

I would like to take this opportunity to publicly thank Stedem Wood, publisher of the Skagit Valley Herald for his cooperation on this project as well as Tony Flynn of the Argus and Ruth Richardson of the Courier Times. Local newspapers do not just bring us the day to day news. They are the recorders of history in the making and are without a doubt one of the most important elements in our society. Without them the past could so easily be forgotten.

I would also like to thank the members of my immediate family, my wife Linda of 25 years, and my two sons, Josef (my webmaster) and Jeffery (my PDF master). Having your family's support and understanding on any endeavor you set out on is priceless.

*Larry Kunzler*





## First Talk About Building Dams

In the early days there was much doubt that dams would ever be built on the Skagit River system.

Several years ago The Times quit building newspaper railroads. This was after it had learned good and well that when railroad officials got mixed up in an interview and “divulged” a lot of plans for the future, that the statement was either an explosion of overworked imagination, or was just the reverse of any real intention. Hence, The Times is skeptical of the big dam story about what Stone & Webster are going to do on Baker River this year and immediately following. . . . Under the most favorable conditions the building of the Baker river dam is going to cost lots of money, and just why the Stone & Webster should begin construction work while the price of every factor to construction is abnormally high and still ascending and transportation precarious, is a mystery. (Source: [4/5/17 SCT](#))

A party of Seattle city officials passed through this city Tuesday on their way to the site of the city of Seattle’s power project on the upper Skagit River. . . . The Seattle power project has been under fire in that city for several weeks, claims being made that all plans so far are indefinite and that the plant will cost more than it will be worth to the city. An organized effort is being made to get the council to drop the project entirely, or at least suspend operations until conditions are more favorable for construction work. There also appears to be a wide difference of opinion as to the character of dam to be built, and in regard to the size of the first unit. The city has already spent approximately \$5,000,000 in building a railroad from Rockport to the site of the project at this stage would result in the total loss of practically all the money already spent, it is not likely that work will be discontinued. (Source: [6/25/21 C.H.](#))

. . . still others say that the Seattle dam at Ruby creek will offer much protection, although when this project will be completed is doubtful. (Source: [12/22/21 Argus](#))

## Fish Hatchery Requirement of Building Skagit Dams

C.F. Uhden, engineer in charge of the Seattle power project on the upper Skagit, has notified the state fish commissioner that the city will construct a state fish hatchery on the Skagit. The city is required to build fishways over all its power dams to permit salmon to reach spawning grounds or build a hatchery. As there will be five large power dams in the completed unity the city has decided to build the hatchery. . . . It is believed that a site near the first dam will be selected. The hatchery will cost between \$10,000 and \$15,000, and will be the thirty-ninth in the state, which gives this state the largest number of any state in the United States. (Source: [3/20/20 C.H.](#))

Although Seattle City Light would later contribute to the building of the Marblemount hatchery they never constructed a hatchery in accordance with what was stated by Mr. Uhden.



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### Seattle City Light Projects

It was over 70 years ago that the first white man battled his way into the fearful Skagit river canyons above Marblemount. They were hunting for gold then, but overlooked a wealth far greater than any metal in the many power sites along the upper reaches of the river. But the country became known and in 1907 engineers made a trip through the same rugged canyons, this time with transit, and level as they mapped out eleven miles of the deepest gorges and made plans for the building of a hydro-electric plant larger at that time than any in the world. By 1919 the project was ready to go and workmen swarmed into the upper country to clear the site for Newhalem and the Gorge Dam, first step in the plan. The Gorge plant, with a capacity of 60,000 kilowatts, was completed in 1924 and the generators were started with great ceremony – President Calvin Coolidge pushing a button in, the White House to start them turning. From then on the project has been in continuous construction. Diablo Dam, 7 and a half miles up from the gorge Plant was completed in 1930. It was built in Diablo Canyon, a gorge of solid granite with vertical walls rising 160 feet from the river bed, yet were less than 100 feet apart. The third step in the plan was Ross Dam, built near Ruby Creek and originally called Ruby Dam. At the death of J. D. Ross, whose dream made the dams possible; his name was given to the latest and largest of them all. Ross Dam was started in 1937, the first step completed in 1940. The second step began almost immediately and the dam is now 545 feet high and has formed a lake 24 miles long. (Source: [6/21/51 C.H.](#))

Big plans for future expansion of the City Light installations on the upper Skagit were proposed this past week to the Seattle City Council. The program came as the result of studies on present and future needs of City Light and the total figure for completed plans will run into many millions of dollars. The new plans include increasing power production by a dam on Thunder Creek, which flows into Diablo Lake; and by construction of another dam on Copper Creek on the Skagit just above Bacon Creek. The Skagit dam would provide an additional 60,000 to 70,000 kilowatts and would back water right up to Newhalem camp.<sup>1</sup> (Source: [4/21/55 C.H.](#))

### Gorge Dam

Mayor Hugh M. Caldwell of Seattle passed through here Thursday on his way to the upper Skagit Valley for his first visit to the site of the city of Seattle's hydro-electric power plant on the upper river. ... He was accompanied by A.H. Dimock, city engineer; C.F. Uhden, special engineer in charge of the project, and J.D. Ross, superintendent of the Seattle light department. The inspection trip will include not only the work already done on the initial development at Gorge Creek, for which an appropriation of \$5,500,000 has been made by the Seattle City council, but also the proposed development at Ruby Creek, said by engineers to be the key to the entire project, if the water power resources of the upper Skagit are to be utilized to the limit of their possibilities. A survey of the Ruby Creek section is soon to be made to determine the feasibility of the proposed construction and its probable cost. Estimates on tentative plans give the approximate cost of the completed project as \$55,000,000. (Source: [6/5/20 C.H.](#))

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<sup>1</sup> Neither of these two dams was ever constructed.



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The mayor expressed himself as greatly impressed with the magnitude of the Skagit project and the wonderful possibilities for greater development, particularly mentioning the splendid sites for power dams at Diablo Canyon and Ruby Creek, where natural conditions apparently make it possible to construct great dams on foundations of solid rock in narrow gorges. He stated that one of the questions under consideration by the engineers has to do with the type of dam to be constructed at Gorge Creek. It has been found possible to construct a low diversion dam at Gorge Creek and a high impounding dam a half mile farther down the stream. The diversion dam would be less expensive, but the impounding dam would develop greater power. So far the only actual construction work has been done at Gorge Creek, where a sawmill has been erected and material is being assembled for the erection of the plant. Test borings are also being made at the Diablo and Ruby sites. (Source: [6/12/20 C.H.](#))

The city of Seattle voted Monday to appropriate an additional \$175,000 for the hydro-electric power project on the upper Skagit River, and it is stated that the major part of the appropriation will be used for the completion of the temporary power plant which is now being built near the mouth of Newhalem creek. With the completion of the temporary electric plant, all the preliminary work will be about, completed, and everything will be ready to being actual construct work on the main project, and it is expected the work on the huge dam will be started by early summer. Although it takes considerable time to make much of a showing on a project of the magnitude of that undertaken on the upper Skagit, the progress made so far is very satisfactory, and it is likely that by this time next year the big dams and the main power plant will be well underway. But even at the present rate of progress it will be several years before the first unit is ready for use. (Source: [11/20/20 C.H.](#))

Although the contract for the construction of the huge power project for the city of Seattle on the upper Skagit river provides that the plant shall be ready for operation by January 1, 1924, present indications are that the project will not be completed before next summer, and it may be even later before electric current can be transmitted to Seattle. It is reported that delays have occurred in all parts of the work, and there is considerable controversy between the contractors and the engineers for the city as to who is responsible for the delay. ... The tunnel for the Gorge creek plant was to have been completed, according to the contract, about two months ago, but it will be at least a month yet before this job is finished, and other parts of the work are at about the stage. Practically all the machinery for the huge power plant is now on the ground and is being installed as rapidly as buildings and foundations are ready. It was planned to transmit current from the new plant to Seattle by New Year's Day, but all hopes of this have been abandoned and about the best that is expected now is to have the plant in operation by June 1. (Source: [12/13/23 C.H.](#))

### Newhalem Gets Power

According to a statement issued by C. F. Uhden, engineer in charge of the construction of the power plant for the city of Seattle on the upper Skagit, the temporary plant was built on Newhalem creek, several miles below the main plant, and is now being used to light the houses and streets of Newhalem, the new town in the upper valley. Later it will be used to furnish power





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and lighting for the construction of the huge dam at Gorge creek and the first unit of the plant two miles below the dam site, as well as for the 11,000 foot tunnel connecting these two parts of the development. ... The work of building the extension of the railroad from Newhalem to Gorge creek, a distance of four miles, is going ahead rapidly, and the first two miles of the extension is now about completed. The end of the road is now at Devil's Elbow, where a bridge will be built across the Skagit River; work on the bridge being now well underway. (Source: [8/20/21 C.H.](#))

Good news for the upper valley was released last night by City Light of Seattle with details of a \$23,000,000 program of construction for the upper Skagit projects during the next three projects during the next three years. The total will include \$17,000,000 for a new 300-foot dam for the Gorge power plant and six million to install a fourth generator at the Ross Dam powerhouse. (Source: [11/26/53 C.H.](#))

### New Dam For Gorge

Contractors are now inspecting the site and preliminary plans for the Gorge high dam and power intake tunnel on the Skagit between Newhalem and Diablo. Seattle City Light hopes to have final drawings complete soon so that bids can be called this summer. The proposed dam is to be a combination arch and gravity structure rising about 150 feet above the present river bed. It will be 670 feet long and will replace the temporary diversion dam for the Gorge powerhouse. . . . Not satisfied with present drilling on the proposed hydro-electric dam at Copper Creek on the Skagit between Marblemount and Newhalem, the Seattle City Light has requested \$250,000 more to continue their search for a suitable bed-rock location for the dam. (Source: [5/27/54 C.H.](#))

### Delays

Delays in the construction work at the Gorge Dam above Newhalem is causing City Light a lot of headaches these days. Faced with a need for additional power to handle the requirements of the expansion of Bethlehem Steel in Seattle, the power officials are desperately trying to work out a quick solution to problems facing the expansion of generating facilities on the upper Skagit. The Gorge dam job is now a year behind schedule, due to the difficulty in solving a "leak" underground at the Gorge site. ... **Thunder Creek Speeded** Long range plans call for use of Thunder Creek as a storage reservoir by use of a new dam. ... At present Thunder Creek flows into Diablo Lake and is used for power there and at Gorge. Three alternate plans have been proposed for better use of the flow. No. 1 is to dam the stream, tunnel through the mountain and let the water go into Ross Lake for extra power all the way down to Newhalem. No. 2 is to put a complete generating plant on Thunder Creek. ... No. 3 is to dam Thunder and divert the water direct to Newhalem by tunnel. ... If the dam at Ross is raised another 125 feet, as projected, the present decisions must take this into consideration. As raising of Ross is up to Canada's decision of whether or not they will permit territory there to be flooded, the problem of future expansion on the upper Skagit is now a tangle of conflicting ideas. (Source: [2/7/57 C.H.](#))



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### First Power Plant To Be Covered With Water

Following our custom of getting old landmarks and bits of history down in black and white so that some record will be made for future years, a recent trip to Diablo found the old water wheel powerhouse of the old Davis ranch still standing and awaiting to be covered up by water of the new Gorge high dam. The water wheel started as a pipe dream of Frank and Glee Davis back in the 1900's and was first conceived as a method of powering a saw mill for cutting lumber in the inaccessible upper Skagit area. Over the years the idea took shape and form, but it was not until 1921 that the project was completed. Then it was found that the wheel failed to create enough power for cutting much timber, so in 1925 the men installed a 1½ h.p. generator and the mill wheel went into the power business as the upper Skagit's first permanent hydro-electric installation. The water powered generator furnished lights for the Davis homestead for several years until the place was sold to make way for City Light. (Source: [5/2/57 C.H.](#))

### Old Gorge Dam Disappears

Only the tops of the sluice gate towers of the old Gorge Diversion Dam remain visible as the waters continue to rise behind Seattle City Light's new high Gorge Dam. The crest of the concrete spillway of the diversion dam was about 35 feet under water at the time the accompanying picture was taken. It will be about 100 feet under water when the reservoir behind the high dam is filled. (Source: [7/28/60 C.H.](#))

### New Gorge Dam Complete

Formal dedication ceremonies at the new Gorge High Dam, above Newhalem on the Skagit River, was held last Friday afternoon with two bus loads of dignitaries and guests making the trip from Seattle, and many others also present from the Skagit projects. Guests included Mayor Gordon Clinton of Seattle; members of the Seattle city council and other officials; Dr. Wm. A. Pearl, Administrator of the Bonneville Power Administration; Henry Heckendorn of the Seattle Chamber of Commerce; City Light officials; newspaper and television men from Seattle and from Skagit and Whatcom County. . . . The Gorge plant was the first of the three Skagit plants built by the City of Seattle and was started in 1919. The first generator was started by President Coolidge in September of 1924. A second generator was installed later the same year and a third in 1929, giving the plant a capacity of 60,000 kw. (Source: [1/12/61 C.H.](#))

### Diablo Dam

The construction of the new Diablo dam for the city of Seattle about 13 miles above Newhalem is a big project, according to E. C. Forner, an engineer for the Superior company, who visited the works last Sunday and looked over the works from an engineering standpoint, rather than from the usual scenic point of view. He brought back some interesting figures in regard to the new dam, which are used in this article. The dam is located at the southerly end of



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the noted Diablo canyon, and when completed will be 570 feet wide at the top and 340 feet high, figuring from the ordinary water level of the Skagit river. Winston Bros. have the contract for the construction of the dam and diversion tunnel and at the present time have a crew of over 400 men at work. The diversion tunnel is now about 70 per cent completed. It will be about 600 feet long and 24 feet square and will be used to carry the water of the Skagit river while the dam is under construction, and will possibly be used later to carry water from the dam to a new power plant. Actual work on the Diablo dam is expected to start within the next three months, with the actual pouring of concrete started within that time. (Source: [2/23/27 C.H.](#))

Reports from the city of Seattle power project on the upper Skagit \$3,000,000 dam at Diablo canyon progressing more rapidly than was expected. The light snowfall this winter and the generally good weather has been in favor of the contractors, Winston Bros., who have rushed the work in every way possible to get the dam to a point where no great damage could be done by high water. During the past week the foundations of the dam were finished to the level of the bed of the river, so that the only damage that could be done now by a sudden rise in the river would be the work of removing the machinery and equipment above high water, and the delay necessary until the water recedes. ... It is expected that the work will be completed during 1929, unless something out of the ordinary construction hazards happens to retard the work. (Source: [1/3/28 C.H.](#))

### Diablo Project Damaged In Small Flood

The warm rains this week brought the Skagit to almost flood stage, but all the damage reported is from the Skagit dam in Diablo canyon, above Newhalem, where the cofferdam was washed out. Two large pumps, worth about \$800 a-piece, were taken out, and a car load of timbers was washed away. No damage was done to the work on the main dam, and the work is already going ahead as usual.<sup>2</sup> (Source: [10/11/28 C.H.](#))

### Diablo Predicted To Be Completed in October

Although Winston Brothers, contractors on the huge dam being built for the city of Seattle at Diablo canyon on the upper Skagit, lost about two months during the past winter on account of weather conditions, it is now practically certain that the dam will be finished before October 1. The work has been progressing rapidly for the past month and final completion of the project can now be estimated within a few weeks. Two electric generators for the Diablo power house and the turbines to operate them were recently ordered for delivery early next year. These generators are of 85,000 horsepower each, greater by 10,000 horsepower than any now in use anywhere in the world. These will double the present production of electricity of the Seattle light department. Bids for construction of the power house will be called within a few weeks. (Source: [4/3/30 C.H.](#))

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<sup>2</sup> Small flood event. 74, 300 cfs, 29.94 ft. at Concrete.



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The huge power dam being built by the city of Seattle in Diablo canyon, above Newhalem, is now practically completed and the waters of the Skagit will be turned into the dam next Saturday. This week the diversion tunnel is being sealed and the two spillways located about forty feet above the bed of the river will also be sealed. When the water reaches the first gate, or spillway, to remain in the permanent structure, it will have a depth of over 160 feet and will form a lake six miles long and twice as large as Lake Union in Seattle. With the present flow of water, it will require ten days or more to fill the big dam. ... The new power dam is one of the highest in the world, towering 389 feet above the bed of the river. It ranges in thickness from 140 feet at the base to twelve feet at the top and is built of reinforced concrete from the base on bedrock to the railing at the top. Superior Portland cement was used in the construction of the dam, and a number of local people have been employed on the project from the time it was started three years ago to its completion. With completion of this dam, Seattle has one of the largest power projects in the west, and the plant will be further enlarged in the near future through the erection of a huge storage dam on Ruby creek, a few miles further up the Skagit. It is expected that work will start on the Ruby creek project within the next year. (Source: [8/14/30 C.H.](#))

### Diablo Dam Completed

The huge Diablo power dam, under construction for the past three years, is now officially the property of the city of Seattle. The dam has been fully completed and was dedicated yesterday at an impressive ceremony held on the crest of the dam. The structure was turned over to the city by Luke S. Oakes, president of Winston Brothers Company, builders of the dam, and was accepted on behalf of the city by J. D. Ross, superintendent of the Seattle Light department, and Mayor Frank Edwards. Other speakers on the program were Governor Hartley and S. F. Tolmie, premier of British Columbia. ... The dam, the second largest of its kind in the world, is located in Diablo canyon, about 35 miles up the Skagit River from Rockport. The dam is of the arch type, 390 feet high, 1200 feet long at the crest, and 140 feet thick at the base. The walls of the canyon are of solid granite and at some places the opposite walls are only nineteen feet apart. The dam was started in September, 1927, and its cost is about \$4,000,000. The ultimate power to be generated from this dam, when all contemplated units have been installed, is 225,000 horsepower. The impounding of the water back of the dam forms a lake six miles long with a storage capacity of 90,000 acre feet.<sup>3</sup> (Source: [8/28/30 C.H.](#))

### Ruby Creek ("Ross") Dam

A large crowd gathered in the Rex Theater in Mt. Vernon Tuesday evening to listen to the plans for a possible means of stopping floods by damming the water at its source. About three hundred were present. . . . Mr. Uhden, the engineer in charge of the big Seattle project on the Skagit River, told all about his work, illustrating with lantern slides. He said that Seattle is planning a dam 480 feet high, on Ruby creek, which will take ten years to build, according to

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<sup>3</sup> Diablo canyon originally narrowed to 19 feet across. This is the exact location of where Mr. Stewart found evidence of his "monster flood" of 1815 which in a later article turned out to be 1820 which is what Stewart originally said. (See The Story of Mox Tatlem [3/5/1936 C.H.](#))



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present plans. If Skagit county men wish to raise money to pay for the work, a flood gate dam will be built instead of a solid crest dam as at present planned.<sup>4</sup> He showed the possibilities of stopping flood which this dam would have. He said that the Skagit River had 100,000 cfs through Sedro-Woolley, while the flow through Ruby creek was 30,000 cfs. The last 20 feet of the dam will take care of one-half of this volume of water for three days, during a flood, and an additional 10 feet would take care of the remainder for six days. The engineers are agreed that this dam is the only logical solution of the flood problem. Mr. Gilkey said that his idea was to get federal aid to help build the dam with flood gates. It was stated that if the people of Skagit county wished to go in on the dam, and have Seattle change its plans, the work could be speeded up to take only five instead of ten years. Another statement made was that the damage in Skagit County for the last two floods was a million and a half dollars. (Source: [1/19/22 CT](#))

That the waters of the Skagit River can be controlled, in time of flood, by the huge dam that the city of Seattle proposes to build at the mouth of Ruby creek, in connection with its power project on the upper Skagit, was the argument advanced by C. E. Uhden, chief engineer on the project, at a mass meeting held in the Rex theatre in Mount Vernon Tuesday night. He stated that the plans for the dam, as drawn for the power project, would have to be modified if it was also to be used as a means for flood control, but that the additional cost could be financed through state or county aid. . . . He claims that the dam would hold the full normal flow the Skagit river for three or four days, and that during times of flood the waters from the upper river could be held back for at least 24 hours, giving the flood waters from the streams of the lower valley time to run off, then the water held at Ruby creek could be gradually released. By modifying the construction of the dam it would be so built that it would hold a larger raise without any danger of flooding the lower valley when the spillways are opened. (Source: [1/22/22 C.H.](#))

### Ross Dam Financing

Calling for expenditure of \$13,500,000 a construction program for City Light's Skagit project including the Ruby reservoir and dam, to be financed thru a government loan and sale of utility bonds, was disclosed yesterday to Mayor Charles L. Smith to the city council. Called into a conference yesterday afternoon, the board of public works approved the program as proposed by Supt. J. D. Ross in a telegram from Washington D.C., and a majority of the city council agreed to concur in the plan and to wire Ross authorizing him to file a formal application with the federal PWA. . . . **Loan Assured** Ross has been in touch with federal officials at Washington and has indicated that both the PWA loan and the utility bond sale will go through. As outlined to the mayor by Ross the plan calls for a loan of 55 per cent of the total cost, or \$7,425,000 and an outright grant of 45 per cent of \$6,075,000. It is proposed to apply the grant as follows: For construction, 25 per cent, or \$3,375,000; for application on bond interest payments, 20 per cent of the cost or \$2,700,000. (Source: [8/29/35 C.H.](#))

Reports from Seattle are that the first money has been appropriated for work on the new Ruby dam and that operation will start within three months. A crew of engineers is now being

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<sup>4</sup> Flood control not in original plans. Seattle wanted Skagit County to get funding for flood gates.



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hired to handle the preliminary work and it is expected that the job will be well under way before the close of 1937. (Source: [12/17/36 C.H.](#))

### Seattle Okays Completion Of Higher Ross Dam

The Seattle City Council this week approved the proposal to negotiate with the builders of Ross Dam for completion of the third and final “step” in the huge Skagit river project. The present contract will be complete, except for minor details in the next two months and the officials of City Light believe that they can secure a good bid on the final step if the work is begun while the contractors have their equipment and labor still at the site. The present dam rises to a height of 475 feet. The final contractor will elevate this to the 540 foot level and will allow the generating equipment to be installed and placed in operation. No power will be generated at Ross Dam until the final step has been completed. . . . The final step on the dam will cost in the neighborhood of seven million dollars and will require another two years work. (Source: [4/24/47 C.H.](#))

### Ross Dam Completion

At formal ceremonies, covered by radio and newsreels the City Light Department today accepted the completed Ross Dam from the contractors General, Shea and Co. The construction company have been cleaning up their operations at the dam site for the past month in preparation for turning the dam over to City Light. The huge dam has been built so that if future needs require it can be raised in height by superimposing another face over the present honeycomb-like structure. (Source: [8/8/49 C.H.](#))

The construction of Ross Dam was one of the most difficult and spectacular jobs in the world. The granite cliffs rise for hundreds of feet from the river gorge. Every pathway, building site and toehold for man or machine had to be blasted from the rock. Construction of the first step of the dam began in September 1937 and was completed March 11, 1940. Work was resumed in February of 1943 and carried through until completion on August 18<sup>th</sup>, 1949. Cost of building the dam was approximately \$28,000,000.<sup>5</sup> (Source: [8/25/49 C.H.](#))

### First Power Generation For Ross Dam

Tests of the first generator to go into service at the new Ross Dam power house were made yesterday by technicians and officials of City Light. The huge generator will produce 70,000 kilowatts of new power for the northwest. As soon as the tests are completed satisfactorily, power will begin to flow from the generator to boost City Lights upper Skagit output. The generator will go into use immediately. Water from Ross Dam has been providing

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<sup>5</sup> Construction of the first step of the dam began in September 1937 and was completed March 11, 1940. Work was resumed in February of 1943 and carried through until completion on August 18<sup>th</sup>, 1949. Cost of building the dam was approximately \$28,000,000. Construction of the entire Seattle City Light project began in 1919.



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extra storage for Diablo and Gorge powerhouses for several years, but this is the first time the water has been used for operation of the new powerhouse. The new generator will be the first of three to be installed under present plans. Each generator is rated for a capacity of 90,000 kilowatts in normal operations with a peak of 100,000 kilowatts when demand is great. City Light officials say the probable output for the present time will be 70,000 k.w. (Source: [12/25/52 C.H.](#))

### Ross Lake To Flood Canada

Seattle's City Light project on the upper Skagit will extend into Canada this year. A crew of 45 men is now at work on clearing a 600-acre tract north of the Canadian boundary and when their work is done about July first, Ross Lake will extend about a mile and a half into Canada. The clearing will provide about 1,400,000 acre-feet of storage in Ross Lake. This will permit three generators in Ross Powerhouse to deliver their full load of 270,000 kilowatts by next winter. Just one generator is now in service. Canada will be paid \$255,508 for the flooding of Canadian lands. The City Light has an agreement for further flooding when the height of Ross Dam is increased 130 ft. under future plans. (Source: [3/26/53 C.H.](#))

Possible development of Ross Dam by addition of another 125 feet is now being considered by City Light, in addition to the work already planned for the Skagit project. E.R. Hoffman, supt., told the power commission Tuesday that the additional 125 feet would impound another 3,400,000 acre ft. of water and provide storage for three or four years as a protection against low water. (Source: [12/31/53 C.H.](#))

The International Joint Commission, which passes on disputes along the United States-Canadian border has agreed to take under consideration the proposal of City Light to flood some 6,000 acres of land across the Canadian border when Ross Dam is raised to extra height. An agreement was made in 1942 with British Columbia provincial officials to pay \$255,508 for the flooding. Later, however, the Canadian authorities decided there should be additional payment in the form of electric power. Issue was reviewed Wednesday in Ottawa. Final decision will be made by the Commission after a study. (Source: [10/23/58 C.H.](#))

After a number of years of negotiation an agreement has been made between Seattle City Light and the Province of British Columbia over the use of Canadian land flooded by the waters backed up by Ross Dam. In signing the pact the Seattle light department agrees to pay British Columbia \$34,566.21 a year on a 99 year lease. The Canadians have given the city permission to raise Ross Lake's elevation to 1,725 feet and put Ross Lake to a point six miles beyond the border. The project of raising height of Ross Dam is one for the future, but until that time City Light proposes to add 2½ feet to the top of the spillway gates. This will allow an increase in storage capacity of the lake and furnish about 25,900,000 more kilowatt hours a year. (Source: [2/15/67 C.H.](#))

### Ross Lake Clearing Accomplished



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Satisfactory completion of the creation of Ross Lake, begun 25 years ago, was acknowledged this week by the United States Forest Service. The announcement that the 24-mile-long lake behind Seattle City Light's Ross Dam had met strict Forest Service requirements was made jointly by Mt. Baker National Forest Supervisor H.C. Chriswell and City Light superintendent Paul J. Raver. "As a result of your cooperation we now have a 24-mile lake which helps produce electric power provides a beautiful recreational area with excellent sports fishing and also aids in controlling floods. . . . Raver explained that preliminary clearing began in 1937 with start of construction on the dam. "The clearing operation began in earnest in 1943. Logging was completed in 1955, and the clearing of debris was completed in 1961. Cost of the clearing operation to City Light was over \$3 million." (Source: [2/8/62 C.H.](#))

### Ross Lake Increased Storage Approved

The Federal Power Commission has granted Seattle City Light the right to increase storage on Ross Lake reservoir by some 2½ feet. The additional storage is now made possible by raising the level of the Ross dam spillway gates by that height. The increased height will provide about 25-million kilowatt-hours a year in electrical power. The new lake level is not expected to affect the lake for its use in recreation. The request was made by City Light following a new agreement signed with British Columbia last January in which the new level of the lake is set for 1725 feet. This will allow Ross Dam to be raised 125 feet sometime in the future and will fulfill the original plans for adding to the height of the dam. (Source: [7/26/67 C.H.](#))

### Lower Baker Dam

Further indications of the intention of the Stone & Webster interests to immediately start the development of the power resources of the Baker river valley were the application last week by the company for a permit from the state to divert the waters of the river, and the further fact that about 15 engineers and surveyors arrived in town last Thursday and left the next day for the upper Baker to start preliminary work on the huge project. . . . The application states that 65,000 horsepower of electricity is expected to be developed in the project. Work on the development, which will be known as the Baker River Power Development, Eden site, will be started about September 30, 1926, if the permit is granted, according to the application. It is generally understood that the Eden site is at the head of the Baker river canyon, about a half mile north of town, and the application indicates that what is known as to be lower dam is to be built first. If the dam is built on this site, the power plant will likely be located in this city, with a steel or concrete pipe line from the dam to the power plant. (Source: [1/17/24 C.H.](#))

The news that work is to start at once on the construction of the huge power project on the Baker River by the Puget Sound Power & Light Co., a subsidiary of the Stone-Webster Corporation, was confirmed last week by A. W. Leonard, president of the Puget Sound Company. The Seattle Times of last Sunday carried a long article in regard to the proposed dam, giving many interesting details regarding its construction, and in the course of the article Pres. Leonard is quoted as follows: "We are pleased to announce the beginning of construction on this important unit of power development. We expect to be developing 30,000 horsepower of





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electrical energy at the Baker river plant by the end of next year, and will install an additional turbine to bring the full capacity up to 48,000 horsepower.” ... The Puget Sound Power & Light company operates a large number of power plants in the western part of this state, and the Baker river power plant will be the second in point of capacity, being exceeded only by the White river plant, which is now producing 61,662 horsepower. However, the power company also has in contemplation a second dam on the Baker River, to be located at Sulphur canyon, on the upper river, and when this is constructed; it will develop nearly as much power as the main dam here. ... The big dam will be located below the Superior railroad bridge across the Baker and as it will be 225 feet high, it will put the railroad out of commission. (Source: [1/31/24 C.H.](#))

Water power development of the Pacific Northwest will receive great impetus in the announcement of the Puget Sound Power & Light company that it will immediately begin the construction of a 45,000 horsepower hydro-electric plant on the Baker River in Skagit County, representing an investment of \$6,000,000. Foundations and approximately a depth of 50 feet of the dam are scheduled for completion this year and the entire work will be finished in 1925 – regarded by engineers as remarkable speed for the construction of such an important hydro-electric unit. . . . The Baker River is looked upon as one of the most interesting electric generating installations in all the northwest, so rich in water powers. . . . As it falls out of Baker Lake it passes through Sulphur canyon where there is a splendid potential development that will come as soon as needful following the completion of the present installation at Eden canyon, twelve miles below Sulphur canyon. Water from the impounding dam in these canyons will create a lake approximately eight miles long and reaching almost to the upper canyon. This lake will be 1600 acres in extent, storing 50,000 acre feet of water. . . . Next on the program of the Puget Sound Power & Light company after the announced development on Baker River probably will be the installation of a hydro-electric plant at Sulphur canyon almost as large as that near Concrete. The waters of the Baker river will then be utilized in two steps, the Sulphur canyon site having not quite the same amount of water available due to the fact that two or three tributaries flow into the Baker river between the two. (Source: [2/4/24 MVDH](#) )

### Work Stoppage

All the men employed on construction of camp buildings and other preliminary work on the Baker river dam project for the Stone & Webster Co., except a small engineering crew, were laid off yesterday until after the meeting of the board of directors of the corporation, which will be held in Boston about March 15. No reason has been given out here for the orders to stop work, as it was generally understood that the preliminary work under way would be completed regardless of the action taken by the directors on the actual construction of the dam and power plant this year. ... W. D. Shannon, general superintendent of construction for the company, who has had personal supervision of the work here, is now on his way to Boston to present his data on the project to the directors at their meeting this month. The people of Concrete are anxiously awaiting word of the action taken at the Boston session, and if the report is favorable, Concrete will be a lively town for the next few years. (Source: [3/6/24 C.H.](#))

### Work Resumes – Fisheries Dept. Files Protest



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The Stone & Webster Corporation has definitely decided to proceed with the development of the Baker River project, and the latest reports are that actual work towards building the huge dam and power plant will be started next week. The men in charge of the preliminary work at the camp and at the dam site have been notified to have everything in readiness for a crew of 150 men by April 1, and the buildings are being rushed, provisions, and supplies hauled in and other work hurried to completion in order that the camp will be ready for the new men. ... Dennis Winn of the United States Bureau of Fisheries has filed a protest with the state against granting a permit for the dam, claiming that it will put the Baker lake fish hatchery out of commission. The Baker Lake hatchery is the only hatchery in the country handling sockeye salmon, and if the fish are stopped from coming up the Baker river, the plant will be unable to secure eggs for hatching. It is believed that this matter will be adjusted at the hearing before the state board next month. (Source: [3/27/24 C.H.](#))

### Full Speed Ahead

The preliminary work on the huge power project being constructed just north of town by the Stone & Webster company has been going ahead rapidly for the past few weeks, and it seems certain that actual construction work on the big dam and power plant will be under way in the near future. At the main camp on the hill a large number of carpenters and other workmen have been steadily employed and there are now about 40 buildings at the camp of various sizes, occupied as bunk houses, dwellings, offices of various kinds, and other buildings needed to care for a large crew. A large warehouse has been built near the site of the old Washington steam plant, and a part of the steam plant has been enclosed for use as additional storage space for supplies and equipment. ... The largest job under way at this time is the construction of a railroad along the east bank of the Baker River from the old Washington plant northerly to the site of the power plant just north of the camp. The railroad follows the bank of the stream a few feet above the water level and passes under the Baker river bridge near the east end between the pier and the bank. There is considerable rock work along the right of way and it will probably require some weeks yet before the track can be laid. A number of new spur tracks have also been built near the Washington plant. (Source: [5/15/24 C.H.](#))

The Baker river canyon presents a wonderful scene of activity these days and each day new changes may be noted in the area adjacent to the site of the Stone & Webster power project on the river. The field of operations extends from the railroad spur in East Concrete, up the Baker river valley on both sides of the river to the high railroad bridge across the river at the head of the canyon. At all points men are busy transporting materials, building roads, erecting buildings, clearing ground, blasting out rock, and a thousand other things preliminary to actual construction work on the project. The camp on the bluff east of the town is a small city in itself, and all along the river are tents and cabins occupied by employees of the Stone & Webster concern. There are now over 900 men employed on the works, and the crews are readily being increased rapidly as conditions are ready for the new men. ... The foundations of the dam will be about 200 feet in width and will be sunk 35 feet into the solid rock. The main dam will be 230 feet high, and the walls will have a gradual slope towards the top, which will have a width of



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about 25 feet. It will be built of reinforced concrete throughout, and will be sunk into the solid rock on each side of the canyon. (Source: [7/24/24 C.H.](#))

### Baker River Diverted

The Stone & Webster Company diverted the waters of the Baker River from the river bed into the diversion tunnel the latter part of last week and the site of the huge dam is now dry ground. A crib dam is being used to keep the water from overflowing during a raise in the river. A large crew of men is now busy in the river bed in getting the ground ready for the building of the foundations of the dam. This work will be rushed with all speed possible so as to have the foundations in place before the river reaches flood stage next fall. The river bed is now being excavated to bedrock for the full width of the dam, and as soon as this is finished forms will be set and the pouring of concrete started. (Source: [8/28/24 C.H.](#))

### Dam Project Suffers Setback

While the heavy rainstorms of Sunday and Monday were greatly appreciated in many communities in Western Washington for putting an end to the fire menace that was threatening heavy damage in many places, the Stone & Webster company is not giving any thanks for the rain. The Baker river power project suffered a monetary loss that will run into thousands of dollars, and the work of several weeks was entirely wiped out. But even more serious is the delay caused by the unexpected rise in the river. The power company has been working against time, using every effort to get the foundations of the huge dam in place before the danger of real floods in the river, and the freshet this week has set the work back from two weeks to a month and makes it that much more difficult to complete the required task this fall. ... The Stone & Webster Company had considerable heavy machinery between the two cofferdams, used in excavating for the foundations of the main dam, including a steam shovel and three large suction pumps, with the operating motors and other equipment. These were all covered by water and sand and will have to be overhauled before they can again be used. The dam foundation between the two cofferdams was made into a lake and was filled to a considerable depth with sand, and much of the trestle work and other structures on the dam site were washed out. Before the company will be back to the point of its operations it had reached Saturday the water between the cofferdams will have to be drained off, the machinery and equipment dried out and overhauled, and the sand and gravel deposited by the river excavated. It is estimated that this will require more than two weeks. (Source: [9/25/24 C.H.](#))

Just after getting the dam site between the cofferdams cleared of water and sand and getting down to excavating again, the Stone & Webster was again given a touch of high water. The steady rain of this week raised the waters of the Baker River to a point where the diversion tunnel would not carry the low, and the cofferdams again overflowed, forming another lake to be pumped out. The Baker is now falling again, and unless it takes a notion to make another rise, the lake will be pumped out and excavation work started again by the end of the week. The job of excavating the dam site is now almost done, and unless delayed by more high water, the



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company will be ready to pour cement for the foundation within the next week or ten days. (Source: [10/2/24 C.H.](#))

### Cement Ready To Be Poured

The Stone & Webster Company has now completed all its preliminary preparations for building the huge power dam in the Baker River canyon, and according to present plans the first cement for the foundations of the dam will be poured tomorrow. The excavating of the site to bed rock has been completed and the first forms are now being set in place. The massive bunkers for the storage of sand and gravel have been built and are already partially filled for the first run, and the battery of huge cement mixers have been set up and are ready for operation, and chutes have been placed from the mixers to the dam site to carry the concrete from the mixers to the dam. The mixers have a capacity of more than 3,000 cubic yards of concrete a day, and it is planned to operate them to as near full capacity as possible. ... The progress of the work up to the present time indicates that the dam and plant will be completed and in operation by the time first fixed by the company, November 1, 1925, and if this is done it will likely set a record that will stand for some years to come. The work being done here is more extensive than the construction of the Seattle project on the upper Skagit, and that plant has been under construction for a number of years and, as now completed, will not have the capacity of the plant being built here. (Source: [10/9/24 C.H.](#))

### Another Work Stoppage

Last Friday the I. W. W. called a general strike on the works of the Stone & Webster company here, over 500 men being called off the work on the power dam during Friday and Saturday. It is estimated that around 150 men stayed on the job, but these were not enough to keep the work going, and as it appeared impossible to get a new crew, the work of the dam and power plant was yesterday closed down indefinitely, and all the men on the work were paid off. All the men remaining at the camp now are care takers and watchmen and the necessary clerical force. While the strike seems to have been under consideration for some time, it came as a surprise to the people of the city. The strikers, nearly all of whom are members of the I. W. W. demanded a 25 per cent increase in wages, more and better food, clean linen once a week, no overtime, safer working conditions, boycott of California products and release of all class prisoners, although it is not shown how the Stone & Webster company could comply with the last demand. The demands of the strikers were refused by the company and the strike was immediately called. (Source: [10/23/24 C.H.](#))

The general strike called about a week ago by the I. W. W. against the Stone & Webster power project here seems to be petering out for lack of opposition. The closing down of all work on the dam and power plant by the Stone & Webster Company was a severe blow to the strikers, as there cannot be any great enthusiasm maintained in a strike where there is no opposition. The closing down of the work releases all the men who did not go out and the strikers had no further change to quarrel with them, and as no new men are being employed there was no further change to keep up interest by stopping strikebreakers, so while the strike is still on, there is very little



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enthusiasm shown and a majority of the strikers are reported to have left town. Where the streets were filled with strikers a week ago, now one is seldom seen, except for the few now on picket duty. ... Owing to flood conditions in the Baker River there is very little chance that the Stone & Webster Company will resume work before spring, even if the strike is called off. For the next few months there will be intermittent high water in the river, and the work is at a stage now where it cannot be continued during high water, and each flood is likely to wash out much of the work done since the preceding one. At the present time watchmen and the necessary clerical force is employed, and it is not likely that the crew will be increased for several months. (Source: [10/30/24 C.H.](#))

The strike called by the I. W. W. against the Stone & Webster work here, which has been on for some weeks, has reached a point where trouble is likely to occur at any time, and conditions are more serious than appears on the surface. The pickets maintained by the I. W. W. are gradually becoming more troublesome and people in cars and on foot are being stopped and interfered with, even though they have no connection whatever with the strike. The few men in this city who are still working at the camp have to be escorted through the picket lines by officers, and even then there have been several narrow escapes from a clash that might lead to bloodshed. (Source: [11/6/24 C.H.](#))

## Fish Expert Studies Dam Impacts on Salmon Runs

Dr. Henry B. Ward, professor of zoology at the University of Illinois and who is known as the leading authority in the United States on the sockeye salmon is spending several weeks in this city and at Baker lake is trying to study out some feasible means of getting the salmon past the power dam of the Stone & Webster company on the Baker river to the spawning grounds at Baker lake, and of getting the small salmon fry from the government hatchery at the lake down the Baker on their way to salt water. Dr. Ward was here ten years ago and made an investigation and collected data at the Baker Lake hatchery and on this trip is also checking up the results of his investigation at that time. Dr. Ward says that on account of the damming of the streams in various parts of the country for power projects, million of salmon are prevented from getting to their spawning grounds, and the small fish are prevented from going down stream, and that careful and scientific study must be given the problem of getting the fish over the dam. He believes that a solution is possible, but is not ready to announce what it may be. According to Dr. Ward, the Baker river sockeyes are the best in the country, and the Baker Lake hatchery has been doing excellent work, but that the salmon in the river will be practically exterminated unless some means is devised to get the fish past the dam. In some places experiments have been made to get the small fish down the river by having them go through the turbines, but the pressure is so great that nearly all the fish were killed. (Source: [7/29/25 C.H.](#)) (See also Dr. Wards Report at [The Influence Of A Power Dam In Modifying Conditions Affecting The Migration Of The Salmon.](#))

## Lower Baker Dam Nearing Completion – Shannon Lake Forms

Washington's newest hydro-electric project, the great Baker river plant is rapidly nearing completion. It will ultimately become the largest hydro-electric power plant of the Puget Sound



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Power & Light Company. In honor of William D. Shannon, the man who has had entire charge of construction, the lake formed by the dam thrown across the Baker River will be known as "Shannon Lake." The lake will be more than seven miles long and will contain sufficient water to cover 70,000 acres one foot deep, ample to supply the power plant with the necessary flow every day throughout the year. The surface area of the lake will be 1780 acres, and it will be 405 feet above sea level. Baker River rises among the glaciers on the south slopes of Mount Baker and Mount Shuksan in Whatcom County. Near the foot of these peaks a glacial moraine backs up the river to form beautiful Baker Lake, the elevation of which is 664 feet above sea level. From the lake the stream flows down mountain gorges and through a valley 15 miles to its confluence with the Skagit River, near Concrete. Just before reaching the Skagit the Baker flows through deep Eden gorge, across which the power project dam has been built 245 feet high and 180 feet thick at the base. It contains more than 220,000 cubic yards of concrete masonry. Back of this gigantic dam will be Shannon Lake, the reservoir that will store the flood waters of the river which will develop eventually 80,000 horsepower for use throughout Western and Central Washington wherever the Puget Sound Power & Light company's transmission lines extend. ... The cost of this great undertaking, with a 13,000 kilowatt substation at Sedro-Woolley, is exceeding \$8,000,000. Under the supervision of Mr. Shannon, a world's record is being made in the construction of this project. As far as known no other plant of equal power will have been constructed in as short a time, or at a smaller relative outlay, and this despite the fact that last winter proved one of the worst on record. Construction was started April 1, 1924. (Source: [10/15/25 C.H.](#))

Washington's newest hydro-electric project, the great Baker River plant, is rapidly nearing completion. ... In honor to William D. Shannon, the man who has had entire charge of construction, the lake formed by the dam thrown across the Baker River will be known as "Shannon Lake." The lake will be more than seven miles long and will contain sufficient water to cover 70,000 acres one foot deep ... The surface area of the lake will be 1,780 acres and it will be 405 feet above sea level. Baker River rises among the glaciers on the south slopes of Mount Baker and Mount Shuksan, in Whatcom County. Near the foot of these peaks a glacial moraine backs up the river to form beautiful Baker Lake, the elevation of which is 664 feet above sea level. ... It (the dam) contains more than 220,000 cubic yards of concrete masonry. Back of this gigantic dam will be Shannon Lake, **the reservoir that will store the flood waters of the river** which will develop eventually 80,000 horsepower for use throughout western and central Washington. ... Construction was started April 1, 1924. (Source: [10/15/25 CT](#))

Forming of the huge artificial lake to be known as Shannon Lake at the Baker River project was started this week when the Baker river was turned against the power dam at Concrete. **During the first day that the course of the river was turned to the lake, the lake rose eleven feet.** The huge artificially constructed lake is eight miles in length with a maximum width of about a mile. Its depth approximates 200 feet. The dam is 245 feet high from bedrock to the top of the flood gates, and is 450 feet long. ... Construction of the dam started about eighteen months ago, on April 1, 1924. (Source: [10/24/25 MVDH](#))

### Skagit Lowest In 30 Years



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An interesting article concerning the level of the Skagit River appeared the same day that the announcement of the Shannon Lake rising eleven feet in one day. One has to wonder if the scientist from USGS ever considered the impacts of the Baker River flows being held up behind the dam had any influence on the Skagit River level.

The Skagit River is now at the lowest stage of flow that it has been for almost thirty years. This startling fact was revealed today by a group of eight field engineers of the United States Geological Survey who have been obtaining measure on the river discharge measurements. . . . Reports from the Upper Skagit district state that the river in that district shows less channel depth this month than at any time during the past twenty-seven years. In places the waters are so low that it is possible to cross the river, hopping from boulder to boulder without getting one's feet wet, according to C.H. Park, supervisor of the Mount Baker National forest, whose office is in Bellingham. The situation in the Skagit river has reached a most serious condition. It was brought out in the investigation which is being conducted by geological surveyors that the river bed in many places has raised twenty feet between here and the mouth of the river. This condition alone is cause for alarm. (Source: [10/24/25 MVDH](#))

### Power Close To Being Generated

The new 40,000 h.p. power plant of the Puget Sound Power & Light company on the Baker river will start operations early next week according to a statement made today by W. D. Shannon, general manager for the Stone & Webster company for the Pacific coast. The huge dam has been filling up rapidly since the heavy rains of the past week and present indications are that the water for starting the turbines in the power plant will be available by the middle of next week. . . . On account of the low water in the river the dam filled very slowly for the first week but the heavy rains have caused a small freshet in the Baker river and the lake has been rising quite rapidly since the first of the week. This morning the water had about forty feet to rise before it would be high enough to start the wheels turning in the power plant, and at the present stage of water it will take about five days to bring the dam up to the necessary level. The water had been coming up almost ten feet a day for the past few days, but from now on every foot of raise will mean a much larger area to cover, so the height of the water will increase more slowly. . . . Present indications are that the new power plant will be in operation before the end of next week, and that soon afterwards Concrete will be using Baker river power for lights and power. As the service has not been very satisfactory for the past month, it is hoped that there will be a change for the better when the local plant is in regular operation. (Source: [10/29/25 C.H.](#))

Last week, with rain every day and a small freshet in the Baker River, it seemed certain that Lake Shannon, the big lake formed by the filling of the dam across the Baker River, would be filled within another week or ten days. However, the rain stopped in a few days and the weather turned cold, and the river quickly dropped to the extreme low level of a few weeks ago. As a consequence the lake is filling very slowly, and unless another heavy rain comes to give relief, it appears as if it will be another month or six weeks before there will be water enough to start the turbines turning in the power plant. The lake has now reached a height where every inch of raise is spread over hundreds of acres in area, and as it rises from now every foot of raise



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will mean a greater area to cover and therefore the raise will be slower. For the 24 hours ending yesterday evening the lake rose just 12 inches. The water at that time was 31 feet below the tunnel and the water level must be 10 feet above the intake before the plant can be started. This means that the water still has 41 feet to rise before operations can be started. At the rate of a foot or less a day, the present rate of progress, it will bring the starting time quite close to Christmas. The Puget Sound Power & Light company has promised Baker River power as a Christmas present to its customers in the lower valley and it now seems that there is little danger that the present will be delivered ahead of time. (Source: [11/6/25 C.H.](#))

### First Electric Power Generated By Lower Baker

The first electric power generated at the Baker river plant of the Puget Sound Power & Light company was carried over the transmission lines from the plant to the substation at Sedro-Woolley today. Unit No. 1 is now in actual operation and is working as smoothly-as an old and tested machine. ... The water in Lake Shannon reached the intake of the tunnel last Saturday and then the water was turned into the tunnel and the machinery turned over for the first time Sunday afternoon. The first few days of the week were spent in making final adjustments and it was not until today that everything was ready to start manufacturing power. The water in the dam is still steadily rising and it is now within about 35 feet of the top. The water is now spreading over such a large area that it only rises a few inches a day, even through the heavy rains of the past week have raised the water in the river. With the plant in operation and using the water, the dam will fill more slowly and it is not likely that the water will flow over the top for some months, unless there is a real flood in the river. (Source: [11/19/25 C.H.](#))

Baker River is harnessed to add its age-old strength to the up building of the Pacific Northwest. The surge of 40,000 horsepower today augments the surging might vibrating in our transmission lines and serving 350 cities, towns and communities in Washington. The investment of over eight thousand citizens of Western Washington in our securities has aided in making this plant possible. . . . Concrete dam 245 feet high. Impounding 70,000 acre-feet of water. Creating "Lake Shannon", 8 miles long. (Source: [11/26/25 CT](#))

Following less than nineteen months elapsed time since the beginning of construction, President A. W. Leonard of the Puget Sound Power & Light company last week pressed the button that marked the official opening of Washington's newest hydro-electric power development on the Baker River, and which increased the company's power output by 40,000 horsepower. Begun April 1, 1924, delayed by a strike and hampered by one of the most severe winters on record in that part of the country, when the flooding waters of the river erased progress time after time, the completion of this plant under the direction of W. D. Shannon, engineer in charge of construction, is regarded as one of the outstanding feats of engineering hitherto accomplished on the Pacific coast and had it not been for an unusual fall through, which materially delayed the filling of the reservoir, it is probable that the lapse of time between the actual commencement of construction and the delivery of power would have been still further reduced. The dam, which is one of the main features of this plant, is 245 feet high from bedrock to the top of the floodgates-many feet higher than any building in the Northwest, with the single exception of the Smith building tower-and contains enough concrete to construct five hotels





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similar in size and type of that of the new Olympic in Seattle. Draining a watershed of 270 square miles, including snow-capped Mount Baker and Mount Shuksan, a reservoir of 1850 acres in extent and of a maximum depth of 200 feet will be formed behind the dam. From the intake at the dam to the penstock a tunnel 900 feet in length and 22 feet in diameter, inside the concrete lining has been constructed. (Source: [11/26/25 C.H.](#))

### Permit Granted To Raise Dam 33 Feet

A permit was issued the first of this week to the Puget Sound Power & Light Company by R. K. Tiffany, state supervisor of hydraulics, for the raising of the Baker River dam by 30 feet. The report published is that the permit provides for the starting of the work before June 3, 1926, and final completion before October 15, 1929. This raise will make the dam 275 feet in height and will raise the waters in Lake Shannon by 30 feet. As every foot of raise now means a much larger area for the water to spread over, the 30 foot raise will mean an increase of water storage capacity of 140,000 acre feet, as compared with the present capacity of about 70,000 acre feet. The estimated cost of the improvement is given as \$100,000, and this expenditure will give the company a water storage of more than double the capacity of the present dam. The purpose of increasing the height of the dam is to make certain that there will be plenty of water to keep the power plant in operation during the months of extreme low water in the Baker River. It is also likely that the local power plant will be doubled in size and capacity within a few years by the installation of two more units, in which case the additional water will be needed during the months of extreme low water in the Baker River. It is also likely that the local power plant will be doubled in size and capacity during the months while the river is at a low stage. (Source: [5/4/26 C.H.](#))

It now appears that the job of raising the Baker River dam an additional thirty feet will be started some months sooner than expected. It had been generally believed that this work would not be started until late in the spring, but indications of the past week are that construction work will be under way next month. While the work will be rushed as rapidly as possible, it is understood that it will require five or six months to finish all the work contemplated at this time. ... There are now about fifty men on the job, and it is understood that the crews will be increased as the work progresses to a maximum of about 300 men. (Source: [2/16/27 C.H.](#))

### Lower Baker Dam Raised 33 Feet

The Puget Sound Power & Light Company is expending \$200,000 according to announcement just made by President A. W. Leonard, to practically double the water storage capacity behind the great Baker River concrete dam at Concrete in Skagit County. . . . This enlargement of capacity is being accomplished by increasing the height of the Baker River dam by 33 feet from its present 260 ft. to a total of 293 feet, making it one of the highest concrete structures of the kind in the world. Water storage in Shannon Lake created by the building of the Baker River Dam two years ago, is now 10,000 acre-feet<sup>6</sup> but will be increased to 130,000 acre-

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<sup>6</sup> 10,000 acre-feet is a typo. Should be 70,000 acre-feet. (See [11/26/25 CT article.](#))



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feet by the heightening of the dam. . . . The Baker River sockeye salmon have a reputation far and wide as among the most toothsome of the salmon tribe. But for the construction of this salmon ladder and railway for the salmon they could not have survived the installation of this mighty dam. A force of some 200 men is at work on these improvements at Baker river. (*Source: [5/5/27 CT](#)*)

A few months ago the Puget Sound Power & Light company started work on raising the height of the big power dam on the Baker River, just north of town, and this work is now nearing completion. The dam has been raised 33 feet from the former level and is now 293 feet high from the bottom of the river. While the new work is only a small proportion of the total height of the dam, it just about doubles the water storage capacity of the dam, the total being increased from 70,000 acre-feet to 130,000 acre feet and so makes it one of the highest concrete structures of its kind in the world. . . . The new construction on the dam was finished just in time to avoid the spring freshet on the Baker River, the employees just having time to pour the last of the cement and remove the tools before the **water started flowing over the dam**, with the additional 33 feet in place. There is now about **eighteen inches of water falling over the dam**, and the waterfall is one of the most beautiful in the state. The construction work here has been delayed by the high water, but some of the incidental work is now being completed, and as soon as the freshet is over, the balance of the work will be finished, including the apron in front of the dam which is intended to spread the fall of the water and avoid all danger of having the dam undermined. The apron is also expected to greatly lessen the loss of salmon fry from the Baker Lake hatchery, a considerable percentage of which is now killed in passing over the dam. While the number of fish killed has been comparatively low, considering the millions of fry passing over the dam, it is reported that the construction of the apron will reduce the loss by more than half. . . . The Baker River salmon ranks as one of the best fish in the world for table use, and but for the construction of the new plan of ladder and fishway they could not have survived the construction of the dam. (*Source: [5/19/27 C.H.](#)*)

Insuring a large additional payroll for Sedro-Woolley, during the next few months, the Stone-Webster 'Co. announced today its plans for improvements in the Baker River power plant at Concrete, and the transmission lines through Sedro-Woolley, amounting to an expenditure of more than \$2,000,000. . . . During the year 1927 the height of the Baker River dam was increased about 33 feet enlarging the storage capacity at that point from 70,000 acre feet to 130,000 acre feet, while the generating capacity was increased at the same time from 40,215 horsepower to 53,620 horsepower. (*Source: [1/5/28 CT](#)*)

### Fish Ladder On Lower Baker

<sup>7</sup>Pictures in this article showed “the first device ever perfected for raising fish over an obstruction over 50 feet high. The fishway has been proven successful during the past month while the sockeye salmon run was on, when thousands of salmon on their way to the spawning grounds at Baker Lake were lifted over the dam. About two years ago three important power

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<sup>7</sup> Steelhead salmon “run” was used as a “test” of the fish ladder. Compare this article to what was stated by the U.S. Fish & Wildlife Service in 1949 ([USFW letter to Corps](#) (re dams at Faber & Sauk sites) and 1969 ([USFW Interim Report to Corps](#)). See also [Historical Record of Fish Related Issues \(1897-1969\)](#).



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developments were under way in this state, each of which would apparently close an important spawning stream to the propagation of salmon. The Baker river project was the first that would be completed and as the Baker is the only stream in the state in which the sockeye salmon spawn, the problem here was the first to be considered. A conference between state and government fisheries officials and representatives of the power companies was called and at this meeting various means for lifting the salmon spawn, the problem here was the first to be considered. A conference between state and government fisheries officials and representatives of the power companies was called, and at this meeting various means for lifting the salmon over the dam were taken up and considered. From the many plans, submitted, the fishway now in operation was worked out and was installed by the Puget Sound Power & Light company at a cost of about \$75,000. The plans finally worked out by the engineers of the power company, with the assistance and cooperation of Chase Pollock, state supervisor of fisheries, and L. E. Mayhall, state superintendent of hatcheries. During the course of construction and while experiments were being made with a run of steelhead salmon, it developed that if this could be retained at each point of his journey up the fish ladder, one of the difficulties of handling the fish would be solved. ... The whole scheme of the Baker river ladder consists of a huge forebay where a fish can fight the swift water and when tired enter the traps on the upstream side of the fishbay, and once entering one of these traps, cannot return. The ladder begins at this point and goes by easy stages up the canyon walls until it reaches a series of flumes built along the river channel. The length of the flume is about 700 feet. The last ladder has for a pool a moveable car. When a quantity of fish of sufficient number has negotiated the last pool of the ladder, the car, which is fitted with a door, is then pulled up a steel incline where the salmon and water combined are emptied into a trough leading to Lake Shannon above. The salmon, therefore, do not at any time leave the water and are simply transported in a large tank full of water to the lake above." (Source: [7/15/26 C.H.](#))

### Fish Hatchery Construction Proposed

The budget of the Puget Sound Power and Light company for 1929, which has been awaited by local people who were anxious to learn what improvements, if any, were planned for this vicinity, was released this week. According to Mr. Sewell, manager of the Northern district, the budget for 1929 is the largest in the history of the company and covers the most ambitious program of power development and service extension and improvement ever undertaken in a single year. ... The budget for this year does not include any appropriation for any new dam or a new unit in connection with the Baker river project. An appropriation is made for the construction of a new fish hatchery on the Baker river to obviate the necessity of transporting salmon over the dam and to replace the government hatchery on the Baker river to obviate the necessity of transporting salmon over the dam and to replace the government hatchery which has heretofore been operated at Baker lake. It is expected the new hatchery will be built before the dam, and will probably be somewhere in east Concrete. No information has been received as to when construction work would start or in regard to the size of the hatchery. This item is included in an appropriation of \$300,000 for betterments and improvements to existing plants, and it is probably that some other work will be done here during the year, in addition to the usual routine of operating the plant. (Source: [1/10/29 C.H.](#))



## Fishway Over Baker Proposed

The upper Skagit was one of the principal subjects at the meeting of the Skagit County Planning Council, held Monday evening at Mount Vernon. Proposed subjects for the upper valley were the establishment of the federal forest experiment station, study of fish development and recommendations on flood control and hydro-electric power. The Water Resources and Fisheries sub-committee, Arthur Ward of Sedro-Woolley, chairman, made the following recommendations to the planning commission: Joint study by the Department of Fisheries and the Puget Sound Power & Light Co., of the possibility of construction a fishway over the Baker river dam; A joint study by the same parties of downstream migration of fish over the dam to determine possible ways of reducing fish loss; Joint study by the department and City Light of means of stabilizing flow from the power stations to reduce fish loss due to stranded fingerlings and exposed eggs at low water. (Source: [3/7/46 C.H.](#))

The ride of the salmon starts from the trap in groups of a few to fifty. From the trap they are hosted to a water-filled tank care on a narrow gauge track, hauled some 400 feet to aerated holding pools where they are alive and jumping. From there they are lowered into a water-filled “bucket” which is picked up by an aerial cable for another ride of 900 feet through the air to the dam to be held in a slatted and aerated scow. Whereupon, at the end of the day, they are turned free to nose their way under their own power upstream again. If, however, gates are kept open when the last haul to the dam is made, the above handling is modified in that the slatted scow is towed by motorboat a mile up the lake so they will not drift down and spill over the dam. . . . There are two traps at Baker – the river trap and the tailrace trap. The river trap makes use of the water spilled over the dam when the gates are open. It is a wooden structure secured to cement and steel piers which is salvaged in the fall of the year if the fishing season ends before floods wash it away. The lumber of the structure would build several houses. It is mostly of 2X6 fir in lengths from 14 to 22 feet. The barrier to the fish is made of these 2X6 boards with spaces through which water flows. These rackbars are slanted towards the middle of the stream and as water flows through the cracks small streams entice the fish along towards the middle of the stream where a wider slot and heavier stream attracts the salmon to enter. This is the trap. The tailrace trap is necessary at times when gates at the dam are closed. Here they are noticed to enter the trap by an artificial stream of water from a flume. (Source: [8/30/51 C.H.](#))

## Fish Experiments

The international Salmon Commission, which is using the Baker River dam in this city for experimental purposes, completed a series of experiments here this week on the salmon run of the Baker River. . . . The principal problem to be solved was the question of whether or not the young fish, coming down the lake behind the dam, would swim deep enough to enter the turbine inlets 80 feet below the surface. This and other questions pertaining to the run kept a crew of four men busy for the past six weeks. . . . It is definitely established that the Baker river runs are dropping each year. Experiments here will be used in determining methods of building



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up the runs. Members of the crew were Roy Hamilton, Fred Andrews and Owen Hughes of British Columbia. (Source: [6/22/50 C.H.](#))

Arrangements for rearing 200,000 salmonoid “guinea pigs” have been made by the Dept. of Fisheries and the International Pacific Salmon Commission. Fifty thousand Skagit river salmon and 150,000 Cultus Lake, B.C. sockeyes will be reared at the state hatchery at Marblemount and the fish will be used next spring in testing the mortality of small down-stream migrants resulting from passage over high dams and through power turbines. Similar tests were conducted in 1950 and 1951 at the Baker River dam of Puget Sound Power & Light Co. here in Concrete. The 1952 tests will also be held here. (Source: [11/15/51 C.H.](#))

A combined experimental project in which the State Fisheries Dept., the International Salmon-Sockeye Commission and Puget Sound Power & Light Co. delved into the long standing problem of getting a fish run over a high dam was closed last week end at the Baker dam here. While results of some of the experiments were disappointing due to unusual water conditions, the general program produced a number of definite conclusions that will be of great value in planning future dams, and in altering present dams so that both water power and fish runs can be maintained without conflict. Of particular interest on the Baker river is the sockeye run, which is deemed of great value. The run taken over the dam by the trap method has been about 3,000 a year. The silver run is about 12,000 a year. In the past year some 61,000 Chinook were planted in the lake in hopes of getting this species started. . . . It was found that the fish are attracted to the positive pole of the electric current and affected according to the size of the fish. Some of the larger fish were killed by the 48 volt current, but the majority were guided into the trap without injury. While the experiments proved the theory workable, high water and technical problems made the results disappointing in that the system was inoperable at the time when the most fish were present in the forebay of the dam. Further laboratory experiments are expected to take out the “bugs” brought to attention in the actual field work here. . . . On the Baker dam it was found that a great mortality occurred due to the fish hitting the surface of the dam on the way down. Those who had a free-fall lived through seemingly without damage. . . . Also under way at present are plans for immediate building of an artificial spawning grounds on the upper Baker, above Baker lake, at which area the fish from the Baker dam will be propagated and allowed to return downstream. This experiment has also proved successful on smaller streams and if it can be carried on in the upper Baker it will be invaluable when the new Baker dam is built and the level of Baker Lake (the present spawning area) is raised 50 to 60 feet.<sup>8</sup> (Source: [6/30/55 C.H.](#))

...Since building of the Baker dam here the transportation of the fish run over the dam has been done with a trap at the powerhouse and hauling the fish in a tank of water by cable from the trap to the top of the dam. When the new Upper Baker Dam is built, the plan is to carry the fish by truck above both dams. To make this possible a permanent fish trap dam would be constructed here somewhere between the two bridges. The proposed dam would be a roof-like structure that would permit a ten-foot barrier to the fish going upstream. A pool underneath would permit the fish to rest and then enter a trap at the east side of the river from where they could be loaded into tank trucks for the trip to Baker Lake. Test drilling found no bedrock as far down as 40 feet, but this was not deemed important in the construction of the light structure. All plans are tentative and will depend entirely on construction of the new dam. (Source: [3/29/56 C.H.](#))

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<sup>8</sup> This study was used in the final approval process of Upper Baker Dam.



### New Fish Trap

A good run of Sockeye salmon is giving the new fish trap installation on the Baker River here a through testing as to efficiency. The trap was put into use a few weeks ago and since that time has done very well in providing a method of getting the salmon to the spawning grounds on the upper Baker. To date the number of Sockeye taken in the trap and transported by truck to Baker Lake has been more than double the entire run of last year. The low dam, which is located just below the highway bridge on the Baker at Concrete, seems to be low enough for the salmon to jump but the construction has been such that the overflow strikes an obstruction of large rocks on the lower side that produce such a turbulence that the fish can not get a chance to jump. For further protection against the fish getting above the dam in periods of high water in the Skagit, the low dam can be raised about two feet mechanically to provide the extra height. (Source: [7/31/58 C.H.](#))

### Power Shortage

The growing power shortage caused by the unprecedented lack of rainfall this year, began to hurt on the local level this week and is threatening even more serious conditions for the balance of the winter. The shortage is no longer just theory – it is here. First to feel the shortage was the plant of Superior Portland Cement, Inc. here. They have had to cut down operations to a minimum. Other industries and even small users are asked to aid in further cuts in order to make the water behind the dams last as long as possible. . . . Actually all the water that is being used is a small stream to keep the fish run in progress. The lake is now at 421.30 ft. – about 15 feet below normal. As a method of comparison the river normally runs 30,000 second feet. At present the flow is but 432 second feet! . . . One thing that must be considered is that the shortage is not just temporary. Unless heavy rains begin to fall and continue for a long period, the lakes and streams will continue to drop. The cold weather is no help as snow will merely pile up in the hills to be used next spring. A Chinook wind is all that could bring it down. Normally this is flood season with lots of water. Today it appears that it will take very unusual weather conditions to relieve the power shortage before spring. (Source: [11/27/52 C.H.](#))

### Mudslides Begin Above Lower Baker Powerhouse

The mud slide, currently plaguing Puget Power above the lower Baker power house here, is of no real danger, according to Andy Miller, local superintendent. The trouble is stemming from a mass of clay on the side hill above the powerhouse on the area cleared for the high lines from upper Baker. Mud started slipping, taking out the quarry road and dumping portions of slippery ooze over the bank and down behind the bulkhead that protects the east wall of the power house. . . . The condition of the soil on the hillside has been known since the dam was built and provisions had been made for expected small slides and runoff water from the area. An old logging road through the section slid out a few years ago. It was believed that springs and seepage at this point caused the latest trouble. (Source: [1/21/65 C.H.](#))



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Mud from the slipping hillside above the powerhouse of the Lower Baker River Dam here, continued to harass the officials and employees last week as they fought to keep the doors of the powerhouse clear and the material moving from the rear of the building where a thick retaining wall shunted it around both sides of the building. The slides on the hill above had been caused by the heavy rains. In the adjoining photo the paths of two separate channels of the mud and dirt can be seen coming down at the rear of the building. Work is continuous on the upper slopes to pump water pockets from the slide area and take weight off the loose masses of top soil. (Source: [2/4/65 C.H.](#))

In any hill-county location the earth slide is a common hazard. In most cases the only thing done is clear it away and forget about it. In the case of the sliding hill above the Puget Power Baker River power station here, it can not be that simple. Their problem is to get the material that must eventually slide to do so gradually, and then work out a plan of attack to prevent any future sliding. Continued wet weather has kept the slide area moving for the past month. In addition to trying to clear away what comes down, the company is now engaged in long range planning of work that will be continued far into the summer to make the hillside safe for future winters. (Source: [2/11/65 C.H.](#))

### Mudslides Destroy Lower Baker Powerhouse

Earth slides from the unstable hill above the Lower Baker increased in activity due to the heavy weekend rains, and early on Tuesday morning started a series of movements that ended with complete destruction of the multi-million dollar installation. First warnings came about 3:00 a.m. and soon a gush of mud from the canyon south of the power house piled high against the building. Working according to a pre-arranged evacuation schedule, men on duty shut down the power operations and were removed to safety by boat. The last man left the building about 4:00 a.m. As the Puget Power men anxiously watched, the hill above began to move like an awakening giant, rolling and slipping with increasing violence. Dirt began to pile up behind the original section of the power station and just before 8:30 the weight of the new slides suddenly broke through the top story walls and sheared off that floor, dropping the roof onto the floor beneath. A huge cloud of dust and the accompanying roar brought townspeople to the observation post high and out of danger south of the power house. From there they watched, fascinated by the force of nature, as the continual slides gradually ground the buildings into twisted girders and crumbling bits of concrete. The process took most of the day, although the old part of the building was completely gone except for the north wall, early in the afternoon. After that forces seemed to divert themselves to the remaining building and by the cessation of slide activity about 2:30 a.m. Wednesday morning it, too, had been damaged beyond repair, though still standing. (Source: [5/20/65 C.H.](#))

**Editorial:** Disaster usually strikes swiftly, dealing its lethal blow and then departing to leave the victims wondering what happened. Nature seldom gives the kind of performance a great many people were fortunate to witness Tuesday. Before their eyes a powerful unseen force moved with deliberate menace to destroy what most of us would accept as a strong and durable bit of man's ingenuity. Streams of seemingly powdery dirt eroded in a matter of hours what it



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took many men a great many months to construct. Here for all to see was a slow-motion demonstration of the ravages by the elements of the puny efforts of man. No wonder a number of civilizations have vanished from the earth, leaving only buried remnants of buildings to be discovered thousands of years later. What we saw was a natural phenomena, a demonstration of the irresistible force of many little grains of sand against a firm block of rock-hard material. The monetary loss will be great in this case, yet due to the whim of timing there was no loss of lives that normally would have added to the tragedy. People who witnessed Tuesday's spectacle will talk for many years about "the day time gave the minutes in hours". (Source: [5/20/65 C.H.](#))

### Cleanup of Mudslides Begins

As anticipated, the line crews of Puget Power had the Upper Baker power station on the line Wednesday of last week after the slide had taken out the lines which were brought through the lower power house, destroyed in Tuesday's big earth movement. A helicopter was used to carry ropes across the 2,150 foot canyon. The heavy lines were then pulled across by tractor and strung from the poles high above the power house. As there was no place for other suspension, the lines cross the entire distance in one span. Power was turned on at 10:00 p.m. Wednesday. Operators and crews for the lower Baker powerhouse are now on duty at Baker Lake operating the station there manually. Previously it had been operated by remote control from the Concrete station. (Source: [5/27/65 C.H.](#))

The transformer from the small sub-station unit was salvaged this week. Officials are still studying means and methods of removing the earth slides and getting to the job of seeing what can be salvaged from the power house itself. . . . Losses to Puget Power in the destruction of their power station and the three huge generators has not been accurately determined. A \$5 million all-risk policy had been carried on the installation. The \$5 million risk was handled by ten insurers and written by D. K. MacDonald & Co. There is a \$100,000 deductible clause. The loss will probably be the biggest insured loss in Northwest history, eclipsing the \$4 million loss paid when the first Tacoma Narrows bridge broke up in a high wind. The policy was first written in 1960 and renewed each three years since that time. Coverage is stated to be on a replacement basis. (Source: [6/3/65 C.H.](#))

Activity at the site of the wrecked Baker Rover power station was progressing in several directions during the past week. Mud from the slide has been removed up to power house, permitting entry to the building. A big drag-line scoop has been clearing slide debris from the river, a 170-foot crane was put into action to retrieve twisted metal parts from the river and to start the work of removing the girders from the damaged building, preparatory to wrecking it. . . . Soil experts are studying the hill from which the slide emerged and their opinion is that the 20-acre mass of loose earth is sitting in a sloping bowl of rock. It was felt that the earthquake possibly could have changed the position of the mass to set off the sliding. Findings of the experts will determine whether or not the power house will be rebuilt in the same location or a complete new installation erected either upstream or down. At any rate it is expected it will be at least two years before the Lake Shannon water is again producing electric power. (Source: [6/24/65 C.H.](#))





### PSPL Wins Lawsuit With Insurance Company

The \$4,900,000 suit involving insurance claims on the destruction of the Baker River power house here, was decided in favor of the power company by a Seattle jury Monday evening. After hearing all the evidence presented by both sides during a session that has lasted since May 23<sup>rd</sup>, the jury found that the insurance claims should be paid in full for the loss. The insurance companies who had shared the large account had contended that due to a clause in their policies specifying written notice of any dangerous condition on the property, the claims should not be paid. They held that the company failed to contact them during the time slides had come off the hillside before the big movement destroyed the power house completely on May 18 of 1965. According to information received here the insurance firms could appeal the decision, but would be liable for \$1,000 a day additional payments due to interest and other costs if they should lose the appeal. (Source: [6/8/66 C.H.](#))

### Lower Baker Powerhouse Again Generating Power

Kilowatts, which had been flowing past the Lower Baker River Powerhouse since the slide of May 1965 were being collected again this week and put to work on the power grid of Puget Sound Power & Light. The new powerhouse, which houses the 70,000 kilowatt generator salvaged from the disaster, is now in official operation although testing and the usual shakedown of “bugs” will continue until all equipment is operating efficiently. . . . Work on the project was done by the Bechtel Corporation and was started in the spring of 1967. The cost of the completed project has been set at \$4,750,000. The company has been awarded \$5,144,645 from insurance following the destruction of the original plant. . . . While the Bechtel Corporation was on the job, the company had them renew all 23 of the spillway gates on the dam. Eight of them were replaced with steel instead of wood and will be operated by remote control. The entire powerhouse has been designed for remote control operation from the Redmond Operation Center by solid state microwave units. (Source: [9/18/68 C.H.](#))

### Upper Baker Dam

A new hydro-electric dam on the Baker River, a project which has been considered by Puget Sound Power & Light Co. for the past twenty-five years, seems about to become a reality! Last week the power company announced that engineers are now preparing the information to apply to the Federal Power Commission for a preliminary permit to develop the project. The Upper Baker site has been owned by Puget for many years, ever since the building of the present dam here, and would make possible a generating plant and a storage reservoir about the same size as the existing plant here – capacity of about 40,000 kilowatts. The new project would have the additional merits of being close to load centers in Skagit and Whatcom counties and would provide better stream control of the Baker River. The latter would enable the company to enlarge facilities at the local power station by 50,000 kilowatts. (Source: [12/31/53 C.H.](#))



### Preliminary Permit Requested

The first step toward the building of a \$12 million dollar dam on the upper Baker River was made last Thursday by Puget Sound Power & Light Company with the filing of an application for a preliminary permit for the hydro-electric project with the Federal Power Commission. . . . The proposed dam would be built at Eaglecroust canyon, about seven miles north of Concrete and would provide a generating plant of about 60,000 kilowatts. The new dam would also provide greater stream control on the Baker and enable additional power production from the present dam and power house here. The local plant capacity can be increased 50,000 kilowatts for a total capacity in excess of 150,000 kilowatts for the combined operation. . . . As the site has been long owned by the company and there are few controversial problems connected with it's construction, it is anticipated that the Federal Power Commission will grant the permit and expedite the plans of the company for early completion of the new power source. (Source: [1/28/54 C.H.](#))

Big news for the Concrete area was in newspaper headlines this week with the announcement that the Federal Power Commission has granted the Puget Sound Power & Light Co. a three-year preliminary permit for its proposed hydroelectric project on the Baker River. . . . Mr. McLaughlin estimated that the completed work, now under consideration, would run close to \$30,000,000 in cost. . . . As heretofore stated, the permit is "temporary" and the work done by the company will be in hopes of proving out all points in favor of a completed project, but the outlook is entirely optimistic from all standpoints. The power is needed, the planning is sound. No adverse findings are anticipated. (Source: [8/26/54 C.H.](#))

A dam on the Baker River north of Concrete is one of several major power projects now under consideration in the Puget Sound – Cascade region, which would more than double the present power supply during the next eight years. . . . The project on the Baker River, which is currently being investigated by the Puget Sound Power and Light Company, would add 140,000 kilowatts of new capacity. Surveys for the dam, which would be located just inside the Whatcom county line, already have been made to a great extent. (Source: [4/25/55 MVDH](#))

### Upper Baker Dam Receives Recommendation

Another boost to hopes of local people that some action will soon be taken toward a new hydro-electric power dam on the upper Baker river was given this week in the release of the power expansion report of the Puget Sound Utilities Council. During the next 8 years the five utilities, public and private, which make up the Council, will invest 670 million dollars or more in new electric power generation, transmission and distribution facilities. . . . First on the list of those recommended for immediate action by Jack D. Stevens, consulting engineer who prepared the report, is the new dam on the Baker! . . . The specifications for the dam as listed in the report call for a concrete, gravity type dam to impound water to a normal elevation of 724 feet. Gross static head would be 290 feet and installed capacity 85,000 k.w. The reservoir would provide 130,000 acre-feet of storage between the two installations. (Source: [4/28/55 C.H.](#))



### Credit Agreement Reached

Puget Sound Power and Light announced from Bellingham today that it has entered into a credit agreement with nine local and nine eastern and midwestern banks to borrow up to \$20,000,000 in the next three years. . . . McLaughlin said the upper Baker project, with a potential of 85,000 kilowatts, would also enable the installation of 55,000 additional kilowatts at Puget Sound's present lower Baker plant. (Source: [8/16/55 MVDH](#))

### Upper Baker on 4 Year Program

Puget Sound Power & Light Company expects to apply by early September for a federal power commission license to develop its Upper Baker river hydroelectric site . . . Hoped for completion date of the Upper Baker development is 1959. (Source: [8/18/55 Argus](#))

Another step toward the final announcement of beginning on the construction of the new hydroelectric dam on the upper Baker river came this week with the announcement that Puget Sound Power & Light Co. will file an application on September 1st for a license from the Federal Power Commission to develop the project. They have set their tentative completion date for 1959. . . . The dam will be located on Eaglekroft canyon, just below the Koma Kulshan ranger station on the short piece of the Baker River remaining between Lake Shannon and Baker Lake. Water from the dam will back up into Baker Lake and will completely change the lake by raising the waters approximately 50 feet. . . . As the company has worked out the details of handling fish runs with the state fisheries dept. no objections are expected from this source. The forest service is also agreeable to specifications. (Source: [8/18/55 C.H.](#))

Good news this week in the announcement that the upper Baker river dam has at last emerged from the tentative stage and is now on the list of things to be done – and with a definite date in mind. The final clincher, of course, will be the day contractors start work. It is a good thing that day is some months away as if there was ever a town unprepared for any sort of a boom, it is Concrete. Our growing pains are going to be very much like the ones experienced during the building of the present Baker dam when there was a tent or shack on every vacant lot, and a temporary town of boards and tar-paper on the East Concrete bench. It was a temporary affair, but somehow the “temporary” shacks seemed to remain behind as permanent residences for many years to the exclusion of any chance of rebuilding with something better. This time a little thought could go into planning for the increase in population if only by zoning out spots for trailer courts, requiring something better than shacks in the residential building areas. Just one of the problems that can face the community soon. We can't say we weren't warned. (Source: [8/18/55 C.H.](#))

### Corps Says Upper Baker “Justified”

The U.S. Army's Board of Engineers for Rivers and Harbors, following a review study in Washington, D.C., this week, again has found that federal participation in flood control projects



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along the Skagit River would not be justified. . . . Under study was a Skagit River flood control program authorized by Congress in 1936, but never implemented because of the unfavorable reports of engineers who held that the work could not be justified from the standpoint of the ratio of costs to benefits. This week the engineers told the board that a \$29,000,000 Upper Baker Reservoir might possibly be justified if built both for flood control and power production purposes, but that such a project would face heavy opposition from fishery and recreation groups operating in the area. (Source: [9/21/55 MVDH](#))

### Application for Construction Made To Federal Power Commission

The Federal Power Commission yesterday issued a license<sup>9</sup> to Puget Sound Power & Light Company to construct a \$35,000,000 Upper Baker River power dam, and the upriver town of Concrete immediately began wrestling with the problems which will result from the construction boom. The site of the second dam on the Baker River will be eight miles north of Concrete. . . . The new dam will be 300 feet high, 200 feet wide, will be constructed of concrete with a straight gravity section, and will be 1,200 feet long with a 12-foot wide road across its top. . . . Ed Monrad, Concrete businessman and past president of the Upper Skagit Valley Booster Club. Said this morning that “right now we are trying to figure out how we are going to put up just 35 engineers and official who will be arriving in the next two weeks. There just isn’t any empty housing in town, and the communities further down the valley also have their problems.” Monrad said he was “shocked” by a poor turnout for a booster club meeting last night – only seven persons appeared – at which discussion of how the community is to solve the housing and other problems which will be posed by the dam project was highlighted. . . . Behind the new dam a reservoir some nine miles long and storing 980,000,000,000 gallons of water will be created. North of the dam a dike 1,260 feet long and 50 feet high, requiring 270,000 cubic yards of earth and rock fill will be constructed. (Source: [10/14/55 MVDH](#))

Application to the Federal Power Commission for a license to build an 85,000-kilowatt hydro-electric on the Upper Baker River at an estimated cost of more than \$27 million was announced today by Frank McLaughlin, president of Puget Sound Power & Light Company. The proposed dam, some 300 feet high, would be located about eight miles above the Company’s present Baker River project and would impound about 238,000 acre-feet of water in a reservoir nine miles, thus providing greater control of the Baker River flow. This will permit another 55,000 kilowatts of added capacity to be installed at the present Lower Baker plant. The two projects will total 140,000 kilowatts of new generation, at an estimated cost of \$35 million. (Source: [10/20/55 B.J.](#))

Application to the Federal Power Commission for a license to build an 85,000-kilowatt hydroelectric plant on the Upper Baker River here at an estimated cost of more than \$27 million was announced this week by Puget Sound Power & Light Co. The application was preceded by last week’s announcement by Skagit County P.U.D. that they had withdrawn their pending condemnation suit against the private company so that it could proceed with its plans. The proposed dam, some 300 feet high, will be located about eight miles above the company’s

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<sup>9</sup> Obviously the MVDH got it wrong. The did not issue a license at this time, they just received the application.



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present Baker River project here at Concrete and will impound 238 thousand acre feet of water in a reservoir nine miles long. The reservoir will raise the level of Baker Lake 40 to 60 feet and will provide a huge storage of water for the Baker river flow. . . . The entire development is scheduled for completion by 1959. **Most Obstacles Eliminated** One of the big obstacles in the hopes for early completion of the dam was removed when a joint study of migratory fish problems resulted in a meeting of the minds between fisheries authorities and the power engineers. Studies at the Baker dam over the past several years have resulted in working out a number of new ideas that have eliminated most of the objections of the fisheries people to another dam on the Baker river, which is a centuries-old spawning area. (Source: [10/20/55 C.H.](#))

One by one the green lights are going up on the Upper Baker Dam and there is now little doubt in a any of our minds that the next three years are going to be busy ones for Concrete and the upper valley. It has been many years since Concrete had a boom in it's midst and those that were here at that time can tell you that it makes a complete change in the community. A lot of folks won't like the change. A lot more will take it for an opportunity to get rich and welcome every last penny. Somewhere between the two extremes is the group that will take it as something that had to come and must be made a benefit rather than an inconvenience. This group is going to have to do the planning necessary to make these ideals hold. A lot of thinking must be done, and soon, to bring a lasting benefit to the community. Fortunately we are well equipped with mercantile stores to provide necessities of life in any amount. Our big shortage is in housing, trailer space, entertainment and recreation. Here is where Concrete needs the facilities of the community betterment program, such is now being carried on in other small towns of the state. (Source: [10/20/55 C.H.](#))

### Construction Begins

“At long last” as royalty once put it, the announcement of the granting of the license for the new Baker River dam was made yesterday by the Federal Power Commission and the Puget Sound Power & Light Company. The news was received rather calmly here due to the fact that it had been so long in the rumor stage and it's receipt had been heralded the first of the week by the fact that a crew of men started work at the dam site. . . . This is the largest power development ever undertaken by the Puget Sound Power & Light Co. The total cost is estimated to be \$35 million dollars, part of which will be in installation of another generator at the present Baker power house in Concrete. Specifications on the dam itself call for a structure 300 feet high and 200 feet wide at the base, to be constructed of concrete. The dam will be 1,200 feet long and will have a 12 foot roadway across its top. Behind the dam a reservoir over nine miles long and storing 980 billion gallons of water will be created. North of the dam a 1,260 foot long dike 50 feet high will have to be constructed of earth and rock fill to maintain the lake level at dam height. (Source: [6/7/56 C.H.](#))

**Editorial:** Now that the upper Baker dam is a reality, the worrisome uncertainty of the future of the valley for the next few years is over. In it's place we have the worry of being able to keep pace. The dam, itself, is just an item of the long list of new projects. It will mean increased logging, a 350,000 barrel order for the cement plant and eventual unlimited possibilities in recreation facilities on the new lake. Elsewhere in the valley the Gorge dam is yet



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to be completed and the Forest Service is contemplating opening a road into the rich timber above Diablo dam – such road to follow quite closely the route of the long-sought North Cross-State Highway. After many years of waiting and talk the promise of the upper Skagit valley is beginning to come true. As the pieces fall into place it will mean a complete revision of life as it has been. A great deal of the charm of our valley has been its quiet roominess. We've been discovered. The settlers are moving in. (Source: [6/14/56 C.H.](#))

A request has been sent out from the Stone & Webster office for local people to list with them all spare rooms that may be rented, or anyone wishing to provide both room and board for one man or more. . . . Superior Portland Cement, Inc. will furnish half of the cement to be used in building the dam, the other half to be purchased from Olympic Portland Cement in Bellingham – making a fifty-fifty break between Skagit and Whatcom counties. Some 700,000 barrels will be required during the job. . . . Most businesses are counting on the increased logging activity behind the dam to provide most of the local prosperity. (Source: [6/21/56 C.H.](#))

The big construction job on the new Baker Dam by Stone & Webster, is still in the stages of preparation of facilities to handle the men and equipment that will be required. The local engineer's building is now completed in the Puget Sound yard in East Concrete and a skeleton office crew is now busy there. . . . Mr. McKenney stated that there are now eighty men working on the dam site. Of these six are carpenters and the rest are clearing land, doing road location, and clearing and burning of right of way. The men are using a logging road north of Koma Kulshan guard station for the present to reach the site, which is about 1½ miles from the Baker Lake road. (Source: [7/12/56 C.H.](#))

### Construction Continues

An ironic situation has developed on the Upper Baker River dam project the past week as lay-offs were necessary due to lack of cement – and the local cement plant is still closed by strike with its storage bins full of the precious commodity. However, work continues at the dam and during the month of September the employment averaged about 850. Highest total workers on the project, including subcontracts, during the past year was 1,004. The pouring of concrete has been under way on four of the 25 blocks, or sections, of the dam. Block nine, which is the farthest along, covers an area 50 feet by 200 feet and now stands 50 feet high. The dam when completed will stand 300 feet high, 1,200 feet across and 200 feet wide at the base. (Source: [10/10/57 C.H.](#))

### Construction Almost Completed

Two unprecedented open winters have paid off handsomely for the Stone & Webster Engineering Corporation now at work completing the Upper Baker River Dam for Puget Sound Power & Light Co. Work is far ahead of schedule, as the above photo shows. According to records, 515,000 cubic yards of cement had been poured at the time of this picture a week ago, leaving only 125,000 yet to be poured to bring the dam to full height. . . . By September the contractors expect to have most of their job cleaned up and the dam ready to begin turning out an



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additional 158,000 kilowatts of new power for the company. The dam will be 300 feet high, 1,200 feet across and some 200 feet wide at the base. The weight has been estimated at 1,200,000 tons. (Source: [2/12/59 C.H.](#))

### Baker Lake Begins To Form Behind The Dam

The Baker River will go to work at the Upper Baker Dam this afternoon at 2:00 P.M. This is the hour set for “dropping the plug” that will close off the flow of the river beneath the huge structure. Water has been diverted through a spillway since construction was started. All that remains to be done for final completion is to close the entrance to the spillway and pour the gap full of concrete. A rather formal occasion is being worked up for the ceremony with engineers and power company officials gathering here to see the Baker River harnessed once again. The lake will start filling immediately, but will not reach it’s full height until some time in the fall. As soon as the water has reached sufficient height, a test will be made of the new generator and power house below the dam. (Source: [7/9/59 C.H.](#))

There was no actual ceremony, no speeches or flag waving, but a large number of visitors crowded the observation points at the Upper Baker River Dam last Thursday to watch the workmen “drop the plug” to start the lake filling. Company officials from all parts of the district were on hand for the first big milestone in completion of the project. The 30 ton cement and steel gates were dropped shortly after 2:00 P.M. and by the time the visitors left the water had covered the Baker River outlet portals and was rising rapidly on the dam. (Source: [7/16/59 C.H.](#))

During the past week water of the new Baker Dam began to raise the level of old Baker Lake, thereby starting the process in which all old familiar landmarks will soon be deep beneath the waters of a new and larger lake. The area has been logged off and cleared until there are few recognizable spots, the most notable one being the old fish hatchery grounds. Here the waters will rise over a most familiar spot for campers, and one not too much changed. The old Bagnell camp across the lake, however, the spot looks little like it was known by so many thousands of visitors who have camped there over the years. All that remains are three of the original cabins, including the old Ruth homestead house and these will soon be demolished. . . . In the program of setting up a recreation plan for the new Baker Lake, the public camps will be of first consideration. After these are developed to fill the needs, next consideration will be given to organization camps. Last in line will be areas for private homes on government leases. (Source: [7/23/59 C.H.](#))

### Baker Lake Needs Cleaning

**Editorial:** The new Baker Lake, promised to be unspoiled and even improved by the new dam, is in danger of becoming a public disgrace. We speak of the driftwood now making the water hazardous to boats and a menace to its usefulness to the public. According to the agreements, the power company is to see that no such condition is allowed to exist. So far they have had a perfunctory contract for sweeping the main debris, but since have ignored sensible suggestions of burning the drift as it please along the shores and low water periods. The lake is



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now high and the accumulation is at the mercy of the winds. It has been just a year since completion of the dam. We'd hate to see this beautiful lake go the way of Lake Shannon – one reason for all the pre-construction clearing and sweeping agreements. Apparently the public is going to have to get good and mad. Our suggestion is that they do it now, rather than complain periodically over a 30-year period with no results as in the lower lake. The Forest Service has not released the company from their commitments. What is occurring is just plain lack of active compliance. Besides the bad effect on visitors to the lake, condition of the water may cancel Cascade Days plans for boat races. A few well-placed letters might build the necessary fires needed to get immediate action. Delay can mean a long time grind. (Source: [7/13/61 C.H.](#))

### Faber Dam

A report just released by the U.S. Geological Survey has attracted statewide attention to a possible site for a huge power project on the Skagit River near the Faber ferry, about four miles east of this city. Two proposed dam sites were examined at this point in September, 1926, by J. T. Pardee, a geologist of the Geological Survey, whose report indicated that the dam sites were of doubtful value. At each site one end of the dam would be built on land of un-cemented silt and the depth to a solid foundation might be so great as to make the cost prohibitive. However, this could only be determined by thorough tests. The recent flood control survey of the Skagit River again called attention to the immense amount of power that would be available if a dam 250 to 300 feet high were built at this point. It is estimated that such a dam would create sufficient storage capacity to control the combined flood waters of the Skagit and Sauk rivers and probably produce all the power needed in this section of the country for many years to come. ... The development of a power project at Faber would be a big boost for the entire Skagit valley and the construction of the dam would eliminate all danger of any further destructive floods in the Skagit River. (Source: [10/17/29 C.H.](#))

### Opposition to Faber Dam

Strong opposition to the proposed Faber dam on the Skagit River can be found elsewhere than in the upper Skagit valley, we find. At a Kiwanis club meeting in Mount Vernon Monday afternoon, State Senator Barney Jackson, public relations officer of the state department of fisheries, voiced his opinion that such a dam would seriously jeopardize the entire Skagit river basin's \$1,185,500 commercial fishing industry, while still remaining an ineffective solution to the flood control problem. In his talk he said that the Faber dam, if constructed, will so diminish the Skagit river in fisheries importance that it will no longer rank as a contributor to the wealth of the state. At present the river is second in importance to the Columbia river, and the new Marblemount hatchery and other work planned for the future will raise it's value over a million and a half dollars. At present the Skagit river contributes 48 percent of the commercial Chinook salmon fishing industry of the Puget Sound area. Along with this there is the sport fishing that brings many dollars to this county because of the river. (Source: [5/2/46 C.H.](#))

Rumblings are again being heard from the federal government on more hydro-electric and flood control projects on the Skagit river. Army Engineers, who have been conducting





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surveys on the Skagit, Cascade, Sauk and Baker rivers for several years, are now nearing the final stages of their work and plan to have their report ready next year. Under consideration by the Army Engineers are four dams: One on the Baker river; one on the main channel of the Skagit at Faber; one on the lower Sauk river and another on the lower Cascade river. They are now seeking information from the state game department as to possible effect on the river's system of fish runs. . . . The Game Commission has issued a statement that "Part of the Skagit river already is blocked by power developments, so we must be on our guard to protect the great fish runs on this stream. The Skagit is famed the breadth of our land for its fine fishing, being worth a tremendous amount to us as a tourist and recreation asset for this reason." The proposed dam on the Baker river (above Lake Shannon) would back water into the canyon above Baker Lake, inundating much valuable recreational area around the present Baker Lake shore line.<sup>10</sup> (Source: [4/7/49 C.H.](#))

### Editorial Opposition To Any More Dams

If the upper Skagit can stave off another "valley authority" on the Skagit river, it will only be because we were warned soon enough to start working against it. For several years now army engineers have been making surveys of possible power sites and flood control projects that could make the valley above Concrete just a serious of ponds. We know that the people of the valley don't want such a thing to happen, but we know also that unless some definite and concerted action is taken to make this fact known we will one of these days find a construction crew on the river banks making ready to put an end to all the hopes and aspirations of those who live in and love this green valley of ours. Too much of the propaganda that calls for despoiling a river is from government agencies themselves whose never-ending greed fattens on more and more "projects" whether needed or not. Power needs are growing, but until present sources are developed to the utmost, no new dams are needed. If upper streams can be utilized, a Faber dam will never be needed for its avowed purpose of flood control. Take warning from the happenings in other quiet valleys. The Skagit is being lined up for sacrifice. (Source: [4/7/49 C.H.](#))

### Faber Dam Beat Up At Public Hearing

The large courtroom in the courthouse at Mount Vernon was filled to capacity yesterday morning as Col. R. P. Young, District Army Engineer, opened what was to have been an all-day hearing on flood control problems of the Skagit River. At the last moment, however, the Colonel decided to cut off hearing those present at noon. . . . During the morning session only one speaker, representing a diking district, favored the Faber dam as the only solution. Speakers against the dam included the state game department, fisheries department and commercial fishermen. Also a number of speakers from the upper valley. A short but vehement telegram from Senator Fred Martin calling a dam at Faber ridiculous. Most of the testimony heard was on need for better diking in the lower valley and projects to dredge the river on the lower reaches to

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<sup>10</sup> Opposition by state to either Faber or Baker due to impacts on fish runs. See 2/25/49 [USFW letter to Corps](#) (re dams at Faber & Sauk sites); 2/23/49 [Letter to Corps from WDOG](#) (re impacts of dam construction); and 3/4/49 [Letter to Corps from WDOF](#) (re impacts of dam construction). See also [Historical Record of Fish Related Issues](#) (1897-1969).



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give the water a better flow. . . . The 1951 estimate on a 300 foot dam at Faber was \$218 million, including only \$2 million for land purchase. At this height the dam would back water to Darrington and cover approximately 35,000 acres. Land in the lower valley considered threatened by floods was estimated at about 60,000 acres. Thus the cost of building the dam would far outweigh the benefits gained. On a per-basis the benefit cost ration is figured at 81 or a loss of about \$2.5 million per year. The upper Sauk dam site listed on the report is 9 miles above Darrington and would cost about \$48 million. Here again the balance of benefit makes the dam impractical. (Source: [2/9/61 C.H.](#))

**Editorial:** The fuss over Faber dam, we predict, will quickly subside under the light of thought and close scrutiny of the basic facts. Unfortunately it is down on paper in a government report and will be raised from the file cabinet each time someone asks for a study of the river for many years to come. We were glad there was a prompt response in the upper valley when the subject appeared in print, but we must admit we were also shocked by the number who believed that our upper valley would be of more benefit to the county under water. But, as one man put it after a quick study of the original report, "None of us knew what we were talking about." The report does not favor a dam at Faber, or Cascade, or Sauk. It merely states that the sites are there and what would be required to develop them. The findings on the latter showed none of the projects as sound investments, and most of them as huge debit items unfeasible except in dire emergency or sudden unlimited wealth. There are more sound and economical ways to end the periodic threat of floods in the lower valley. The thing is, don't relax your vigilance in warding off danger to your valley and your homes. Someone is always ready to offer someone else as a sacrifice. Until we have more voters than the lower valley, we are expendable. (Source: [2/9/61 C.H.](#))

### Sauk River Dam

That another huge power project is to be started in the Skagit valley was indicated Monday when application was made to the state supervisor of hydraulics for a permit to divert the waters of the Sauk River for power purposes. At the same time preliminary plans were announced by Lars Langloe, president of the Pacific Development company of Olympia, and R. K. Tiffany, consulting engineer and former supervisor of hydraulics. These plants provide for the development of a \$3,000,000 hydro-electric project on the Sauk River, to be located about five miles up the river from the old town of Sauk. Langloe and Tiffany said they were acting on behalf of a company whose identity they were not at liberty to disclose at this time. An application was filed for a permit to impound 375,000 acre feet of storage, water behind a dam 210 feet high and 1,000 feet long. The project will develop power for industrial purposes only. The company's application requests authority to divert 1,000 cubic second feet of water daily from the Sauk River, a tributary of the Skagit. The preliminary plans call for a 20,000 horsepower plant, with provisions for additional units to be added later. (Source: [1/3/29 C.H.](#))

At last week's conference on Skagit flood control problems held with U.S. army engineers, A. G. Mosier, prominent local civil engineer, submitted a report advising the construction of a reservoir at the Sauk river, rather than a huge spillway plan, which army men had recommended. "Having an experience of 47 years with the actions of the Skagit River, it is



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my belief that channel control, or bank erosion control, is the most important element of the situation,” said Mosier. “The relief for surface drainage is also urgent. That flood control begins at the source and not at the mouth of a stream is common sense. Now that the Seattle project insures the building of the Ruby Creek dam, which insure 26 percent control of most floods, and with the enforcement of the operation of the Baker River dam for a reserve reservoir to handle emergency run off from that region, my contention that all floods could be controlled if a flood reservoir were built on the Sauk river.<sup>11</sup> The estimate for such a dam given out by the U.S. engineer’s office, is \$5,700,000, only about one million more than the Avon Cut Off, which, in my opinion, would be entirely unnecessary were this reservoir dam built. (Source: [3/11/37 CT](#))

### State Opposition To Any More Dams

John M. Hurley, Jr. chief of the stream improvement division of the state fisheries department spoke at a Salmon bake at Hope Island on Sunday, opposing the full development of power in the state as the end of the fish runs of the state. He spoke against the CVA in that it would place jurisdiction of all state fisheries in hands of a federal board. He also spoke at length on the Skagit river’s proposed Faber and Sauk dams, which he said “would reduce the Skagit to relative insignificance as a producer of migratory fish.” He urged that the people go slowly in approving legislation that will destroy all fishing resources in favor of power development. (Source: [7/5/49 C.H.](#))

### Sauk Dam Urged – Again!

Dams on the Sauk and Cascade rivers were again urged by the U.S. Army Corps of Engineers, at a Puget Sound Water Resources Task Force hearing in Anacortes Monday. Robert Gedney, chief of the planning branch, told the group to continue study of the dams, which he says are needed for 100% flood control on the Skagit River. . . . It was also urged that all Skagit flood control projects be coordinated under a master plan so that there would be no overlapping of expenditures in piecemeal work. The twenty diking and irrigation districts of the county now spend \$250,000 a year on Skagit river work.. (Source: [10/15/64 C.H.](#))

### Importance of Dams and Flood Control

Citizens quickly learned the value of putting dams on the Skagit system. John S. Finstead from Conway and a member of the very first flood control committee formed in Skagit County in 1922<sup>12</sup> immediately following the 1921 flood wrote the following in an article for the Skagit Argus:

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<sup>11</sup> “All floods could be controlled if dam on Sauk allowed. “ This is the same river that carried 3 volcanic lahars to the lower valley from Glacier Peak. There will never be a dam built on the Sauk.

<sup>12</sup> (See [1/5/22 Argus](#), and [1/12/22 Argus](#))



## Historical Dam Building And Their Impacts on the Floods Of The Skagit River

In recent years there has been some agitation for the purposes of controlling the floodwaters of the Skagit river, but as time passes on after a disastrous flood, the people of the valley easily forget that they ever had a flood, until another comes along. Then they will have meetings for some time figuring on dredging and straightening the channel, **but in the end nothings come out of it.** . . . Not considering the disastrous summer freshet in 1894<sup>13</sup> we have had six or seven fast winter freshets during the past 30 years. The highest one of these was the one of November 30, 1909,<sup>14</sup> when about eight inches of rain fell in two days at upriver points. This flood measured about 220,000 second feet at Sedro-Woolley. Competent engineers claim that only about 150,000 second feet can pass through at the Riverside Great Northern bridge. Consequently about 70,000 second feet had to seek an outlet somewhere else. The February flood of this year was not considered dangerous but still it destroyed half a dozen homesteads at the Sauk delta and broke dikes at the Skagit delta to the value of at least \$20,000, besides destroying several bridges at upriver points.

We have back in the mountains numerous large basins and deep gulches and valleys. Undoubtedly places can be found where a dam can be built equaling for storage purposes at least half a cube mile. The Ruby dam of the Seattle hydroelectric project is to be 480 feet high creating a lake about 25 miles long and five miles wide in most places. Back of this dam the Skagit has a shed of about 1200 square miles or a little more than one third of the whole basin of the Skagit and its tributaries. Actual measurements at this dam site by USGS shows the minimum flow to be 800 second feet and the maximum 50,000 second feet during 12 years of observation up to 1923. Supposing the upper 20 feet of this dam was reserved for flood control it would take care of the maximum flow of 50,000 for at least twelve days.

Stone & Webster are going to build a dam across the Baker canyon back of Concrete in the near future. Here another lake will be created up to six or seven miles long. If 20 feet was reserved for flood control at this dam, Baker River would be eliminated from any flood danger from that source. (Source: [3/20/24 Argus](#))

### The Dalles Flood Gage

At a meeting of the board of county commissioners held last Friday it was decided to immediately install a hydrographic station at The Dalles of the Skagit River, near Grasmere, to record the height and flow of water in the river during flood stage. As the river is now at its lowest stage, and as this work must be done while the river is low, it was decided to save the time it would take to call for bids for the installation and to have the work done under the supervision of the county engineer, and Deputy Engineer Wright will be in personal charge of the erection of the station. While the details of the station are too technical for a layman to understand, the work will consist of a concrete well from a point about two feet under low water to a point above extreme high water mark, in which will be installed instruments to automatically record the height of the water, and a cable will be strung across the river on which will be suspended instruments to gauge the flow of the stream. The work of installing the station will

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<sup>13</sup> This flood caused the downtown area of Mt. Vernon to go underwater. (See [10/21/1895 The Skagit News](#))

<sup>14</sup> This may have been the highest flood in Mt. Vernon's history however there is evidence that the 1921 flood was the highest upriver as well. (See [12/22/21 CT](#))



## Historical Dam Building And Their Impacts on the Floods Of The Skagit River

start at once and will be completed within 30 days. The estimated cost of the completed station is about \$1,800, of which the greater part is for the instruments to be used. The cost of the station will be paid out of the special river improvement fund. In addition to providing a permanent record of the river during flood stages, the station can also be used as a warning to the residents of the lower valley, as the record of the height of the flood here will give the people on the lower river a change to prepare for the crest of the flood in that locality, as an accurate record of the height of the water here will give them the data on which to base the likely height below. In the event of extreme high water, much property can be saved, and possibly lives, by having advance knowledge of the flood stage for which preparation should be made. (Source: [7/31/24 C.H.](#))

### 1924 Public Testimony

One of the most important public meetings in the history of Skagit County took place on November 26, 1924.

Citizens of Skagit County appeared before Col. W.J. Bardon, District United States Engineer of the War Department yesterday in the Mount Vernon Commercial club rooms and presented evidence of past damage by Skagit river floods. The hearing was called by the War Department officer "in connection with a report on preliminary examination of the river as directed by an act of Congress of May 31, 1924."

The Skagit river improvement committee composed of representative men of this county with H.L. Willis as chairman, prepared data which was presented at the hearing, calling attention to the report filed with the county commissioners by J.E. Stewart in 1922<sup>15</sup>, a copy of which also was filed with the U.S. Biological Survey<sup>16</sup>.

The report states the "cost of dikes already constructed together with repairs and enlargements has, to date, exceeded 1 1-4 million dollars." ...

"The era of power development for electrical purposes into which we are now entering seems to give hope along a practical line for flood relief. There is at present one large dam on Baker River in process of construction. Another is projected in the Skagit at Ruby creek. Still another on the Sauk River has been discussed. If arrangements could be made with any or all the builders of these dams to hold always available the upper ten feet of the dam for flood storage the greater part of our flood menace would seem to be gone. Such storage for 48 hours would hold back the crest of the flood and give time for run-off. It is the crest of the flood that breaks the dikes and does the damage."

The report quoted in detail from the report made two years ago by J.W. Collins, secretary of the Commercial club which stated that the flood of 1894 damaged crops in the valley

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<sup>15</sup> Mr. Stewart was hired in 1922 but his report was not given to Skagit County until 1923. ([See 12/20/23 CT](#)) Mr. Stewart's Report was not believed to be correct. ([See 11/26/24 Knapp Testimony and 11/26/24 Minutes. See also Stewart Whitepaper.](#))

<sup>16</sup> This should read "U.S. Geological Survey".



## Historical Dam Building And Their Impacts on the Floods Of The Skagit River

approximately 1 1-2 million dollars. The flood of 1897 also did great property damage and in 1906 the loss was estimated at \$250,000 while that of 1909 was placed at 1 1-2 millions. The flood caused estimated damage at \$500,000 in 1917, according to Mr. Collin's report. (*Source: [11/27/24 Argus](#)*)

### Levee and Flood Testimony

While all of the testimony at the November 26, 1924 public hearing was fascinating, of particular interest was that of a local farmer, J. O. Rundene.

. . . I have lived in Skagit County forty-nine years and am familiar with the flood conditions, experienced in the Skagit Valley and particularly the LaConner flats, so called, during that period of time; that the first freshet and flood from the Skagit River that I recall, occurred the last of **May in 1882**. At that time **there were no dikes** on the Skagit River, but the land bordering on the same extending upward to the foothills and the foothills themselves were all covered with a heavy growth of fir, cedar and spruce. The water at that time covered the LaConner flats and stood on my farm three feet deep for a period of about two weeks, the depth of the water varying during that period of time. . . . **In 1883 I commenced to build dikes along the North Fork of the Skagit River.** These dikes were gradually increased and work was done on them continuously until 1895, when I retired as Commissioner, and at that time it appeared to me and I thought the dikes were sufficiently high to protect the land against extreme high water at all seasons and during all flood conditions. . . . As this condition has increased the size of the dikes have also been greatly increased, until at the present time the dikes are at least three times as large as they were in 1895, when they were considered sufficient for all possible purposes. There were other freshet of lesser consequences during the intervening years, but the next time at which the entire country was covered with water, as I recall it, was in 1909. At that time the dikes broke at various points on the Skagit River and North fork flooding the entire country between Mt. Vernon and LaConner and between Burlington and the mouth of the Samish River at Edison, being territory about ten miles square, to a depth of from two to eight feet of water. There was water in the vicinity of my place, about six feet deep, for a period of two weeks or longer, the water standing on the land for a period of a month or more. The next large freshet was in 1917, occurring in December and the entire country above referred to was again covered with water to a depth of from two to six feet, the water remaining on the land until after Christmas time. The next large freshet was in 1921 on New Year 's Day. The entire country was again covered to a depth of from two to six feet and the water remaining on the land over a period of two weeks. . . . (*Source: [11/26/24 Rundene Testimony](#)*)

### Citizen Request Lower Baker Dam Be Used For Flood Control

Due to conditions similar to 1894 with respect to a heavy snow pack, and the removal of the timber from the hills, local Judge requested that Puget Sound Power & Light lower the level behind Lower Baker for flood control.



## Historical Dam Building And Their Impacts on the Floods Of The Skagit River

Judge Crookston urged that the Puget Sound Power & Light Co. be requested to lower the level of the water in Lake Shannon, behind the Baker River dam, so the lake could absorb the surplus which will come down when the warm weather sets in. He said that conditions now are similar to those in the spring of 1894, when the Skagit Valley was flooded. The difference now, he added is that the forests on the hills which formerly retarded the rush of melted snow have been removed; therefore the danger is more acute. . . .

I do not wish to assume the role of a harbinger of disaster,” said Mr. Moore today, “but those citizens of the Skagit Valley whose homes and live stock are protected from floods by dikes, should understand that the stage is partly set for a more than ordinary flood.<sup>17</sup> The mountainous district to our east has as heavy a snowfall as I have seen in 15 years,<sup>18</sup> with much of it recent or new snow, which is rapidly melted by a warm rain or Chinook wind, and as the spring is far advanced we can expect a sudden change. “Lake Shannon, the result of the dam at Concrete, will be of benefit during a flood, although the Baker river only represents one fifth of the total water in the Skagit river. Such a lake retards the water to some extent, lengthens the time of passing and thereby lowers the peak of the flood. (Source: [5/5/27 Argus](#))

### Flood Control and Ruby Creek (Ross) Dam

Present dams on the upper Skagit River would not provide flood control for the Skagit Valley in the event of a flood like that of 1917 or 1921. . . A big flow of water would fill the Diablo basin in one day, and would continue over the dam with the same disastrous effects as in previous years, said Smith. Existing dams serve a good purpose in holding back sudden small freshets and also tend to maintain a higher water level in the valley during extremely dry years, but no safety from heavy floods can be felt until the completion of the Ruby Creek dam, the final unit of the Seattle project.

**The completion of this dam will render impossible even such floods as the one in 1815, which Indian tradition has it, submerged much of the Skagit Valley to a depth of fifteen feet, the engineer believes.**<sup>19</sup> It is hoped by the city of Seattle that money can be obtained from the national government to assist with the construction of Ruby Creek dam, which is now being delayed on account of financial crisis. At the present outlook, the dam may not be built for five or even ten years . . . People of Skagit Valley will be appealed to for aid in an effort to get such an appropriation on the grounds of flood control.<sup>20</sup> (Source: [1/7/32 Argus](#))

### Dams and the February 27, 1932 Flood Event<sup>21</sup>

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<sup>17</sup> No flood happened in 1927.

<sup>18</sup> Most snow since 1912? If this statement is correct it would tend to support theory 1917 and 1921 floods were caused more by rain then snow.

<sup>19</sup> Either the engineer didn't know what he was talking about or he was purposely misleading the residents of Skagit County.

<sup>20</sup> These statements were attributed to Glen Smith, assistant to J.D. Ross.

<sup>21</sup> USGS 147,000 cfs Concrete (39.99), 157,000 cfs Sedro-Woolley, no figure for Mt. Vernon.



## Historical Dam Building And Their Impacts on the Floods Of The Skagit River

Bridges at several points were damaged or removed by the raging waters of the Skagit Saturday and Sunday when the breaking dikes and back water sent a yellow flood over nearly 20,000 acres of land and forced many residents to abandon their homes in search of safety on nearby high points of land. . . . In the valley proper no loss of life has been reported, and the accident claiming four lives at Diablo, just as the waters threatened, remains the major incident of the highest flood waters since 1921. . . .

**Bridge Out:** Knapp<sup>22</sup> reported the Diabase creek bridge washed out, sixty feet of span and an equal amount of trestle, the forty foot truss over Hanson creek on the river road tipped over, slides on the Van Horn and Faber hills, damage of fifty feet of the west approach of the Jackman creek bridge, and a wash-out on the German Prairie road west of the Samish school, where the bridge over the Samish remained intact. . . . Following the slide above Newhalem the Skagit began rising slowly, but the condition was not believed serious until late Friday night, when flood conditions were approached. Friday night and Saturday morning the water rose at an amazing rate, with lowlands along the river being flooded.

**Fill Damaged --** . . . Constant rumors of danger to two dams in the Skagit and Baker river power projects resulted in an alarm that one of the dams had broken, and many residents of Hamilton, Lyman, Sedro-Woolley and Mt. Vernon removed to higher ground with emergency rations. It was reported a man coming down the river had given the false alarm, and Lyman was almost deserted by the exodus that followed. Responsible agencies spiked the rumor within an hour, and the bolting residents for the most part returned to their homes.

**Dams Are Safe --** Consequent investigation disclosed that flood gates on the dams were not opened and that flood waters poured over the tops of the dams. **At Baker River before the flood, water was 36 feet below the top, and at the peak of high water flowed nine feet deep over the top of the dam.**<sup>23</sup> At Diablo gates were left open until engineers were certain that a flood was imminent, and then closed the gates Friday afternoon. **Early Saturday morning the water flowed over the Diablo spillways, when no more water could be retained.** . . . The same authorities also explained the fact that while flood waters at Mt. Vernon reached within inches of an all-time record, the peak at Sedro-Woolley was from four to five feet under the record. **This was due to the fact that previous floods had removed two curves below Sedro-Woolley and shortened the river's course nearly one half mile.**<sup>24</sup> This makes the river almost straight from Burn's bar three miles west and the effect had been to lower the river bed here nearly four feet.

**Dikes Broken --** Shortly after noon Sunday the dike south of Burlington gave way and the Great Northern fill broke at 12:45 to release a yellow flood through Varney's slough and Gage's Lake to inundate the section between Burlington, Avon and the Bay View ridge. . . .

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<sup>22</sup> Knapp was the County Engineer at that time.

<sup>23</sup> At least for a period of time there was no flood control provided by any dam on the Skagit River as water was pouring over the top of both Lower Baker and Diablo dams.

<sup>24</sup> They are talking about the Sterling (Harts Island) and Debay Island cutoffs. The Sterling cutoff happened in 1911 and it is believed that the Debay Island cutoff happened either in 1921 or 1924. (Source: <http://www.stumpranchonline.com/skagitjournal/S-WArea/Sterling03-Fam-DeBay.html>)





## Historical Dam Building And Their Impacts on the Floods Of The Skagit River

Breaking of the dike at Conway relieved the pressure in this district late Sunday afternoon, and a large section in the lower end of the county was covered with water. (Source: [3/3/32 CT](#))

When the flood was nearing its height, and as residents along the Skagit were beginning to get worried over its steady rise, someone started a rumor in regard to the stability of the Diablo dam. In Burlington, Mount Vernon, and other communities in that vicinity, the report was that the dam had cracked and that all the water would have to be let out at once, and for all to prepare accordingly. This report was also received here, but given no credence, but it was believed along the lower river. At Lyman and Birdsvew this rumor was first heard, then later a report that the dam had broken, and for all to flee for their lives. At Lyman the fire siren was blown, and every resident of the community took to the hills with such valuables as could be easily carried. ... The source of the story cannot be definitely traced but it seems to have started at Burlington and worked its way up the valley. Hamilton missed much of the excitement, and the up-river communities failed to get this story, as telephone lines were out. (Source: [3/3/32 C.H.](#))

While many parts of Skagit County and Western Washington suffered heavy damages from flood waters last Saturday, Sunday and Monday, Burlington, on three sides, emerged practically untouched and losses in the immediate adjacent country were comparatively light. West Conway, Skagit City and up-river communities suffered most from rising waters of the Skagit River, which flooded an extensive countryside for the first time in ten years. **The great power dams in Baker river and the Upper Skagit and rather elaborate diking systems in the lower valley, proved only partial protection from a mighty river filled to overflowing, after two days of warm Chinook winds had melted snow in the mountains.** . . . Anxiety was felt for a few hours following the break in the dike south of town Sunday noon, but was dispelled when the Great Northern railway fill gave way, allowing the water to sweep over the fields to the West and Southwest. Strong Chinook winds of Thursday and Friday filled the Skagit to the top of its banks, and Saturday water began overflowing and covering the land up to the dikes. Shortly after midnight Saturday water had risen to a height of less than two feet from the top of the dike east of Burlington. Sunday morning, with water backed up from the Burlington dikes to Clear Lake, a distance of between six and seven miles, the situation became dangerous. The dike was becoming soft in many places and the water continued to rise gradually. Old-timers expressed the belief that there was more water back of the dikes than in any previous flood. (Source: [3/4/32 B.J.](#))

### Diablo Project Blamed For Flood Damage

Alleging the flood gates on Diablo dam were opened at the crest of the recent high water, thus releasing an additional torrent of water in the already bankful Skagit river, causing dikes to break in many places, four Skagit dike districts, and three individual farmers today filed claims aggregating \$53,315 against the City of Seattle. The claims were rushed to Seattle today so they could be filed before the thirty-day limit expires.

**List of Claims:** Following is the list of claims filed against the City of Seattle, owner of Diablo Dam, which is a part of the city's power development on the upper Skagit. Dike district No. 2, located on the west side of the Skagit river and north of Fir – Claims damages in the



## Historical Dam Building And Their Impacts on the Floods Of The Skagit River

amount of \$17,500. Dike district No. 13, located between Dry and Brown sloughs on Skagit delta, west of Fir – Demands \$4,000 damages. Dike district No. 186, located between Fresh Water and Dry sloughs on south side of pavement, west of Fir – Demands \$6,500. Dike district No. 12, located south of Burlington – Demands \$10,000. Phillip Iverson, farmer living northwest of Fire, demands \$2,925. Iver Iverson, same locality, demands \$7,650. John Leander, same locality, demands \$4,000.

**Water Held Back** On February 23<sup>rd</sup>, according to the complaint filed with the City of Seattle, the reservoir behind Diablo dam was approximately half full of water, the amount being between 35,000 and 40,000 acre feet of water.<sup>25</sup> At that time, the flood gates of the dam were not opened, although the water was continuing to rise, the complaint states. (Source: [3/26/32 MVDH](#))

J.D. Ross, City Light Superintendent, today declared “ridiculous” claims for \$53,315 damages against the City of Seattle, filed with the city comptroller today by four Skagit county diking districts and three Skagit county farmers as a result of floods in the county late last month. . . . “The dam held back the first on-rush of water down the river,” Ross said. “As soon as the lake back of the dam rose to the height of the flood gates, we began releasing the water gradually. Only a part of the gates were opened, just enough to prevent the water from overflowing the top of the dam. This controlled the flood, releasing it only as fast as the river could carry it away. The damage to the dikes down in the valley occurred after the crest of the flood had passed at Diablo. It was simply a case of where the river could not hold the water which poured into it from numerous streams below the dam, in addition to carrying the controlled flow through the flood gates. (Source: [3/26/32 MVDH](#))

### Dams and the January 25, 1935 Flood Event<sup>26</sup>

Early this morning the river was said to be rising two inches an hour at Concrete. **The flood gates were opened on the Baker River Dam at Concrete yesterday, and huge quantities of water poured from that point and later reached the Skagit.** The amount of water coming over the dam was said to have slowed down considerably this morning, indicating it had been colder in the upper stretches during the night. . . . Many acres of farm land in the northern part of the county were flooded by the Samish. It was said the Samish flood was the worst in years. Wednesday night the water rose to three inches deep over the floor in Joy’s store at Allen and was level with the floor yesterday. The Pacific highway was covered with water to within a mile north of the Triangle service station in that section of the county. At Sedro-Woolley serious flood damage to property was saved early Wednesday morning when a group of citizens in the north end of town gathered under the direction of E. C. Carr and cut a channel through the old grade road northwest of town. A four-foot culvert with which the county had recently replaced a bridge, proved inadequate for rapidly rising waters which soon flooded the homes in the surrounding districts, and but for the prompt action of the men in cutting the

<sup>25</sup> Crest of the flood happened on February 27<sup>th</sup>. If the statement of Diablo Dam being half-full is true it would mean that Diablo filled from being half full in 4 days.

<sup>26</sup> USGS 131,000 cfs Concrete (37.9), no figures for Mt. Vernon. More than 1975, less than 1979.



## Historical Dam Building And Their Impacts on the Floods Of The Skagit River

channel a serious flood menace would have threatened, putting the entire north end of the city under from three to six feet of water, with perhaps several feet in the business district. (*Source: [1/25/35 MVDH](#)*)

### Lake Shannon Lowered For Flood Control

With Skagit County suffering from the effects of the most disastrous flood it has experienced in recent years and with flood control one of the principal topics of discussion throughout the state, as well as local, the following figures furnished by C. K. Hatcher, superintendent of the Baker River plant of the Puget Sound Power & Light company, are of particular interest. More than a week before the flood, according to Mr. Hatcher, the lake level was lowered gradually from an elevation of 435 feet to an elevation of 429 feet, thereby providing storage for part of the tremendous volume of water brought down by the rapidly melting snow. ... All gates on the dam were closed from 5:30 p.m. to 8:00 p.m. Saturday in order to lessen the flood at high tide, and during this period an additional surplus, estimated at 620,000,000 gallons, was stored and held until the receding tide permitted its discharge. (*Source: [2/7/35 C.H.](#)*)

With Skagit County suffering from the effects of the most disastrous flood in recent years, and with flood control one of the principal topics of discussion throughout the state, as well as locally, the following figures furnished by C.K. Katcher, superintendent at the Baker River plant of the Puget Sound Power and Light Company, are of particular interest.

More than a week before the flood, according to Katcher, the lake level was lowered gradually from an elevation of 435 feet to an elevation of 429 feet, thereby providing storage for part of the tremendous volume of water brought down by the rapidly melting snow.

At no time, according to Mr. Katcher, during the entire flood period, did the flow of water released at the dam equal the tremendous volume poured into Lake Shannon from above. This clearly demonstrated, he said, the value of the dam and the lake in minimizing property damage as the result of the flood. (*Source: [2/8/35 B.J.](#)*)

### Storage Behind Dams Part of Best Flood Control Option

A \$4,740,000 canal leading from Avon westward into Padilla Bay, augmented by power reservoirs in the upper Skagit country, has been named as the most feasible method of flood control for the Skagit River and its Tributaries. The recommendation was made by Thomas M. Robins, colonel of the United States Army Corps of Engineers in a news release . . . The construction of the channel westward from Avon was recommended as essential and it would be started at once.

“This report finds that the best plan for flood control on the Skagit River is to construct a by-pass, leading from the river near Avon into Padilla Bay, and to provide storage in connection with proposed power developments on the Skagit river system at the Ruby, Cascade, lower Sauk,



## Historical Dam Building And Their Impacts on the Floods Of The Skagit River

and Baker lake dam sites. Provision of storage cannot be undertaken at this time because the proposed power developments are not now warranted, but the by-pass should be built as soon as practicable because this work alone will afford much needed protection. (Source: [8/22/35 Argus](#))

### \$13,500,000 project for Skagit River Seattle City Light Project

Calling for expenditure of \$13,500,000, a construction program for City Light's Skagit project including the Ruby reservoir and dam to be financed through a government loan and sale of utility bonds was disclosed here today following a meeting yesterday in Seattle. Clearing Ruby basin to elevation 1,600 feet, \$1,250,000; constructing the Ruby dam to elevation 1,500 feet, \$7,750,000; transmission line from the Gorge plant at the Skagit to the south substation in Seattle, \$2,500,000; . . . houses, etc. at Gorge and Diablo, \$97,940. (Source: [8/29/35 Argus](#))

### Dams Part of Flood Control Plan

Two U.S. army engineers from the office of Col H. J. Wild, in charge of the district, today told the Mount Vernon chamber of commerce that \$4,982,000 flood control channel from Avon to Padilla bay is the most feasible procedure to eliminate flood danger in the lower part of Skagit county. . . . "The Skagit River has been studied from many different angles." Maj. Baker stated, and after naming several stated that the most effective means visualized was by the diversion of the channel at Avon." . . . When questioned as how he had arrived at the cost of the benefits, Maj. Baker stated that damages from all the past floods had been totaled and the average annual loss computed with the construction costs. The proposed channel is to start at Avon but preliminary work would have to start east of the Great Northern railroad bridge. The proposed channel is to be 1,500 feet wide at the bottom. It will be used strictly as a flood control measure and will not carry water except during flood conditions. Maj. Baker reviewed the history of floods on the Skagit during the past 26 years for which records have been kept. The highest flow of water at Sedro-Woolley during that time has been 220,000 feet per second. The present river below Mount Vernon can accommodate a flow of about 120,000 feet per second. The proposed channel is to carry any in excess of 100,000 feet per second, Baker stated. The channel's capacity is 120,000 feet per second. We have had larger floods, the speaker stated. In 1815 it is known that a flood with 450,000 cubic feet per second was seen. In 1853 there was a flow of 350,000. **The building of power dams on the Ruby, at Diablo, on the Baker and Cascade rivers will all tend to help the flood control situation and although the channel itself is not capable of handling flood waters to such extremes as has been mentioned, with the aid of these other factors it should be adequate.** Many questions and suggestions were raised by the people present. Suggestions by Wm. Hayton, Albert Mosier and Gene Dunlap that rip-rapping the cut banks of the river from Mount Vernon to the Sauk and dredging the mouth of the river were heard. The guest speaker stated that such was a good policy but that its cost would far exceed that of the channel proposal. He estimated the costs of such a system at eleven million. Dredging at the mouth of the river met opposition from the speaker. **Dredging will have no effect on high tides, he stated. And high tides are always higher during flood periods. It is the high tide that will tend to hold your river up, he added.** (Source: [11/5/36 MVDH](#))



### No Water For Power; River Is Lowest In Many Years

This section is having the driest season it has known for many years. H.L. Devin, official weather statistician, says that the Skagit River is the lowest he has ever seen it in the month of November for the past 47 years. The water is as low now as it ordinarily is most Februarys, when everything is frozen in the mountains. The water in the Baker river dam at Concrete, which generates electricity for Sedro-Woolley, is 75 feet low, and for the last six weeks it has been necessary for Sedro-Woolley to get power from the Shuffleton plant on Lake Washington. . . . There has been only one-fifth as much rainfall as usual for this month. Precipitation from November 1 to 24, inclusive, has been 1.34 inches, while the normal precipitation for this period is 6.74 inches. October also was a dry month. The rainfall was 1.06 inches as compared to the normal of 4.80 inches. For the past month and three-quarters there has been only 2.4 inches of rainfall, while the normal for the same period would be 10.2 inches. (Source: [11/26/36 CT](#))

### \$25,532,000 For Ross Dam Placed On Back Burner

. . . Of the 190 projects in Washington, Oregon and Idaho, 113 projects, cost \$189,984,000 to construct or complete, were listed for immediate construction. Among these projects in Washington state were . . . The proposed \$4,798,000 cutoff in the Skagit river; . . . Fifty projects, costing \$219,374,000 and recommended for deferred construction, included dredging the Columbia river from Vancouver to the Bonneville dam at a cost of \$2,380,000; . . . Among 22 projects, costing \$111,510,000 and listed after the deferred group, were the \$25,532,000 Ruby dam project on the Skagit river; the \$14,612,000 Sauk river project; . . . Among local projects recommended for deferred construction were . . . Skagit county drainage district 17, flood control, \$107,000; Sauk river channel, river channel, revetments, \$53,000; . . . (Source: [4/12/37 MVDH](#))

### Diablo and Baker Dams Help Control Floods

Using the Stewart Report as the justification for his analysis, Glen Smith, Engineer for Seattle City Light felt that the 1815 flood described in the Stewart Report was a 100 to a 400 year event.

Mr. Smith touched briefly upon the floods of 1932, 1921, 1917, 1909, and 1856, but the last really big flood, he stated, was in 1815, nearly 120 years ago. In 1923, James Stewart of the U.S. Geological survey set out to make a study of floods of the Skagit river, and with such information as he gathered he discovered that in 1815 a flood occurred in this valley which left layers of river silt in the inner bark of cedar trees on the Skagit flats fifteen feet above the level of the surrounding country. The survey was carried from the mouth of the Skagit River to Ruby Creek, and Mr. Stewart found evidences of big floods all the way. In the Diablo canyon in the upper Skagit are well marked evidences of water having raised to more than a hundred feet above the normal stream elevation. "I suppose we could work out by the theory of probabilities



## Historical Dam Building And Their Impacts on the Floods Of The Skagit River

just how often such a big flood might occur. It may be once every hundred years, or every four hundred,” said Mr. Smith, but **the only condition necessary is to get ten inches of rain over the watershed in a period of 34 hours with the temperature above 50 degrees.** In 1932 we had 11½ inches of rain but it was spread over a period of 72 hours. In 1932 conditions were all in order for a flood in the proportions of that if 1815, but the rain broke one day early.”. . . Mr. **Smith showed by a series of charts how the City Light project on the Skagit River has materially lessened the danger from floods by its huge reservoir at Diablo.**<sup>27</sup> **The Baker river reservoir at Concrete also is instrumental in lessening flood danger.** The city of Seattle has spent \$25,000,000 on the Skagit power project, and receives 85 per cent of its current therefrom. Thus, the city of Seattle is deeply interested in flood control work in the Skagit valley. (Source: [5/20/37 MVDH](#))

### Seattle City Light Dams Are Huge Asset To County

Be it said to the everlasting credit and honor of “J.D.” Ross and his zealous associates, a few of whom are still living and carrying on, and to the credit of the good people of Seattle who followed their leadership, they have created a marvelous, living, pulsating, engineering project on the upper Skagit river that will endure and serve the people of their city and adjoining coast communities for countless generations to come. They have reclaimed a mountain wilderness for human service, they have transformed a raging, rushing river, confined for thirty long miles in an almost inaccessible, towering, precipitous canyon, into a modern gigantic hydroelectric power system. They have harnessed nature, without destroying it, to serve the needs of man. They have taken possession of the flood waters of this short but mighty Pacific Coast river, removing the menace of annual disaster to the rich and broad valley lands below, and stored them to furnish more power. . . . It really belongs to Skagit County by every rule of geography and contiguity, although the first and original Gorge Powerhouse at Newhalem lies three miles north of our county boundary line is, therefore, in Whatcom County. . . . Every mile of inhabited and cultivated Skagit valley, aside from the project installations, lies in Skagit County. Some day we hope the legislature will consider these facts seriously enough to attach this eastern area of Whatcom County to Skagit County, of which it should be a part for all practicable purposes. . . .

**County Job** Building the Skagit project was not child’s play but a man’s job. It took grit, courage, sweat, and hardship to drive tunnels, build dams, install machinery, to even set up living quarters up there. The cost cannot be measured in money. Where the upper dam, Ross Dam, was built in the past few years and where it is now being raised, there wasn’t a level spot on which to build crude living quarters. . . . It is probably the world’s worst construction site. An idea of the depth of the river canyon – a narrow one at that – is gained from the fact that this man-made reservoir, or lake, is 100 feet deep in the channel between Diablo and Ross Dams, a distance of about eight miles. Above Ross Dam, Ruby Lake spreads out with less depth and when new work on this dam is finally completed, this reservoir will back up five miles into Canada. Seattle has already acquired the necessary Canadian property and flood rights.

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<sup>27</sup> It would be interesting to review those charts today as Seattle City Light has stated that they cannot provide any flood control from Diablo Lake.



## Historical Dam Building And Their Impacts on the Floods Of The Skagit River

**Three Units** The Seattle project consists of three separate units, built in series. Briefly the original Gorge powerhouse at Newhalem, opened in 1924, receives its water through an 11,000-foot tunnel heading in the river about three miles upstream. Seven miles above Newhalem, reached by the electric gorge railway, is Diablo Dam and powerhouse. This water comes from Diablo Lake and consists of the entire flow and storage of the river above Newhalem. Construction of the highest, or Ross power plant, waits on the completion of this dam. . . .

**Hunters' Paradise** . . . Towering above the construction camp 175 feet, or 305 feet from solid bedrock, Ross Dam presents a veritable facsimile of Niagara Falls, a roaring, fascinating cataract, whose clouds and sheets of spray at times envelop and drench everything within hundreds of feet. . . .

**Would Raise Dam** Engineers estimate that the present Ross structure can be safely pushed up 235 feet higher, or 75 feet higher than the contractors are now building it. Efforts are being made to do this but the decision is in the hands of the Federal Power Commission. . . . For comparative purposes it may be stated that the Diablo plant operates on a 313-foot head of water. It is also important and reassuring to know that Ross Dam is 200 feet thick at its base, tapering to 65 feet at the top, crown measurements.

**Huge Reservoir** Of special and vital interest to Skagit County and its people are the figures on reservoir storage, for this constitutes flood water projection. Diablo Lake now contains 90,000 acre-feet of water. Ruby Lake is about 10,000 acre-feet larger. When the present contractors raise Ross Dam 160 feet, the water storage in Ruby Lake will increase to 676,000 acre-feet. If and when the dam is raised another 75, as desired but not authorized, Ruby Lake will reach the enormous size of 1,400,000 acre-feet and, as related, will cross the Canadian border, a body of water 21 miles in length. Thus, practically the complete flow of the Skagit River will be controlled and harnessed, i.e. the river above Newhalem. . . . The dams on the upper Skagit built by the City of Seattle have unquestionably alleviated flood conditions in the lower valley and the greater storage planned for Ruby Lake will remove the menace, as long as the dams hold. . . .

**Skagit County's Interest** . . . Mr. Hoffman, who is no stranger to Skagit County, wants our people to know more about the Skagit project and take a deeper interest in it. . . . He would like us to feel that these dams are reservoirs have given us greater security against lower valley floods. . . . Some day we hope we may utilize some of this power created by our own river. **It is our project as well as Seattle's.** (Source: [8/11/43 MVDH](#))

### Flood Early Warning System To Aid In Dam Flood Control

Creation of flood warning system for the entire Skagit valley with emergency service to spread the alarm in event of dangerous conditions was announced today to Attorney A. H. Ward of Sedro-Woolley, chairman of the water resources committee of the Skagit county planning commission. The warning system will be sponsored jointly by the United States weather bureau and Skagit county commissioners with various county officials, public and private



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agencies and individuals cooperating. It involves daily rainfall, snow and river level reports from various cooperators located at 10 strategic points throughout the Skagit basin. . . . As the project develops and forecasts are based on information obtainable in the upper reaches of the Skagit, it will be possible to utilize power dams to aid in controlling the river. Weather bureau officials pointed out that by holding the crest of an upper Skagit flood at Ross dam for only three hours might permit a Sauk river crest to pass harmlessly whereas the combined crest of both streams might result in great losses to farmers and other residents of the valley. (Source: [2/23/45 B.J.](#))

Creation of a flood warning system for the entire Skagit valley with emergency service to spread the alarm in event of dangerous conditions was announced today by Attorney A.H. Ward of Sedro-Woolley, chairman of the water resources committee of the Skagit county planning commission. . . . As the project develops and forecasts are based on information obtainable in the upper reaches of the Skagit, it will be possible to utilize power dams to aid in controlling the river. Weather bureau officials pointed out that by holding the crest of an upper Skagit flood at Ross dam for only three hours might permit a Sauk river crest to pass harmlessly whereas the combined crest of both streams might result in great losses to farmers and other residents of the valley. (Source: [11/22/45 C.H.](#))

### Flood Early Warning System Dies

Skagit County's flood control warning system, which had been developed by the county planning council three years ago, is now being abandoned. The two men employed by the county during three months of the year to check weather gauges in the mountains on the upper Skagit have been notified that their services will no longer be required. The action was taken by the board of county commissioners who feel that this service is already being duplicated by other agencies such as the power projects on the river, and that there are adequate means of warning in case of flood danger. (Source: [5/5/49 C.H.](#))

### Extraordinary Rainfall At Diablo and Ross

Extraordinary rainfall--a total of approximately 11 in. --was recorded by the weather station at Diablo for the week ending October 27. October 24, with 6.49 inches of precipitation and October 25<sup>th</sup>, with 2.21 in. were the worst days. The water behind Ross Dam was raised 18.5 feet to the maximum height possible with the present construction. This impounded 25,660 acre feet of water and took the peak off the flood which descended on the Skagit valley from the drainage area below the dam. (Source: [11/1/45 C.H.](#))

Extraordinary rainfall – a total of approximately 11 inches – was recorded by the weather station at Diablo for the week ending October 27. Heaviest rainfall was recorded on October 24, with 6.49 inches of precipitation, and October 25, with 2.21 inches. . . . Residents of Marblemount, Newhalem, Diablo and Ross Dam were marooned for three days, while every available City Light man worked to get traffic lines open. . . . **the water in back of Ross Dam was raised 18.5 feet, to the maximum possible with the present construction.** This





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impounded 25,660 acre feet of water and took the peak off the flood which descended on the Skagit valley from the drainage area below the dam. Enough flood water was stopped by Ross Dam to cover 25,000 acres of land more than a foot deep, had it not been held back, said City Light officials. Completion of the second step of the dam, now under construction, will create an even more effective flood control, company officials pointed out. (Source: [11/2/45 MVDH](#))

### Dams Are A Menace To Salmon Runs

Stating that new proposals for dams in state waters are threatening the very existence of Washington's salmon runs, Milo Moore, state director of fisheries, has announced creation of a new division of his department to determine the requirements of fish life at these new developments. . . . Vigorous planning and a sensible distribution of available water supplies are the only means of providing a balanced state economy, said Moore in announcing plans for the new division. (Source: [12/15/45 MVDH](#))

“You can kiss steelhead runs in the Skagit and sockeye runs at the Hope island goodbye if the army engineers go through with their plans of constructing a dam at Faber's ferry.” Those were the words of Ken McLeod, well-known Seattle sportsman and writer who addressed a large gathering of sportsmen at the annual banquet of the Wildcat Steelhead club held here Thursday evening at the city hall. Faber Ferry on the Skagit river has already been surveyed by the army engineers as a site for a flood control dam. . . . The commercial and sport fishing value of over a million dollars annually as set by the department of fisheries, hardly scratched the surface, the speaker asserted. Taking into consideration the money spent by out-of-county fishermen who pay for meals, lodging, guides and sporting goods here, this figure comes close to 38 million, he said. (Source: [5/9/46 CT](#))

**Editorial:** The question will soon arise as to which is more important, several acres of river Skagit valley bottom land or a river full of fish for the sportsman and the commercial fisherman. We are referring specifically to the unquestionable possibility of one or more flood control dams that may be erected on the Skagit river. Surveys for such a dam at the Faber ferry have already been taken and these water barriers have a habit of popping up suddenly, especially in periods of unemployment. If such a dam were to erected on the Skagit river it would mean the saving of several acres of rich soil that is being washed away by floods. However, on the other hand, it would in all probability mean the eventual elimination of the great migratory runs of fish in the river. Past experiences with river dams have proven that even with so-called efficient fish ladders, they have in many cases completely destroyed fish runs. Is the value of fish runs in the Skagit more or less that the threatened farm land? In our estimation and that of state game officials and sportsmen, the fishing value is by far greater. . . . It doesn't make sense to save a few acres of farm land at the expense of one of our most important resources. (Source: [6/20/46 CT](#))

To the Editor: Your editorial of June 20, entitled “Farm Land or Fishing” states that there is a pending conflict of interest between the fishermen and the farmers of this community over prospective flood control dams on the upper Skagit river and aligns the editorial policy of your paper with the fishermen and against the interests of the farmers. Your editorial represents that the damage done by the Skagit river is limited to the loss of a few acres of farmland. This is such



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an understatement as to amount to a misrepresentation of the facts. You have lived by the Skagit river for over a quarter of a century and you are personally acquainted with the families of the farmers in that community who have lost their entire farms through riverbank erosion. While you have lived here, you have seen the river carry away the earnings and savings of a lifetime of hard work invested in river bank farms. You know that this erosion will continue until some means is found to regulate the spring and fall run off of water to a more steady stream. . . . Your editorial completely ignores the matter of flood damage by the river. You state that the only work required on the river is channel straightening and riverbank revetments. Just how will river straightening and riverbank revetments eliminate the periodic flood damage in this valley? The engineers state that straightening the river course will increase the speed of the current, increase the danger of flash floods, and will increase erosion. A flood which measures more than 120,000 second feet of water at Sedro-Woolley will break the dikes and flood the lower valley. . . . Certainly the matter of preservation of fisheries is a part of this problem to be solved and a most important part. In any river improvement work done, provision must be made for saving our fisheries. The army engineers are working on part of this problem right now in survey being made. Before you start taking pot shots at the army engineers, why not wait and see what solution their report contains with respect to the saving of the Skagit river fisheries? There are many other problems in connection with the development and control of the Skagit river system besides erosion, floods and fisheries. There are the problems of development of recreational facilities, irrigation, reforestation and hillside erosion, and domestic water supplies. Will it be to the best interests of this community if your paper succeeds in dividing up the people of the valley into hostile factions, each fighting the other for the benefit of its favorite project? We request the support of your paper for a program of control and development of the water resources in the county which will not favor one of the elements over the other but which will attempt to reconcile and harmonize any conflict of interest between these various projects. *A. H. Ward, Chairman, Water Resources Com. (Source: [6/27/46 CT](#))*

For months now the Puget Sound Mail has been trying to point out the danger of the dam building movement to the commercial fishing industry and trying to arouse LaConner fisherman to an organized effort to present the fishing industry's story. Now it appears that the men who make their living by catching and processing fish have still another fight on their hands, that of over-zealous and short-sighted sportsmen who desire to eliminate most types of commercial fishing. It would appear to the Puget Sound Mail that the sports fishermen should get together to fight for a greater fish propagation, to carry the battle to those who would place dams where spawning grounds are endangered, rather than squabble among themselves. *(Source: [8/7/47 Argus](#))*

## Control Of Dam Overflow Asked By County Commissioners

In an effort to lessen the possibility of a major flood in Skagit county due to the record amount of snowfall now in the Cascades, the Board of County Commissioners and the Skagit County Planning council this week contacted by letter, heads of both the Seattle City Light and the Puget Sound Power and Light companies in a request that these concerns co-operate in regulating the flow of excess water over their respective dams on the Skagit and Baker rivers, and making more storage space available during the peak flow. Following is a copy of the letter written to Gene Hoffman, superintendent of City Light, and Frank McLaughlin, president of



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Puget Sound Power and Light, and signed by W. A. McLean, chairman of the planning council and James T. Ovenell, chairman of the board of commissioners:

Gentlemen:

The Board of County Commissioners and the Skagit County Planning Council have requested that this letter be written in an effort to gain your help in solving a flood control problem. . . . We wonder if, through the cooperation of City Light and Puget Sound Power and Light it might be possible to avert potential disaster. It is our understanding that the existing dams on the Skagit, if proper regulation of water flow be had, can serve as an important agency toward preventing a flood. We understand also that as a prerequisite to the grant of the right to place dams, the federal commission requires that the upper reaches of such dams be made to assist in flood control. . . . Those of us who have lived here all our lives know that the diking assistance can handle all but the last few feet of water. . . . We realize that the problem of City Light and Puget Sound Power and Light is to be sure that they have abundant water at all times. With the present snowfall there can be no doubt that sufficient water will be available. The difficulty is there will probably be far too much water. Would it not be possible, through full co-operation and intelligent regulation, for the storage levels to be maintained near the minimum requirement until the excess of melting snow comes through warm winds or warm weather, and when that does start so regulate the flow as to allow escape during its maximum periods. We appreciate the fact that the water that comes through the Skagit, as far up as the City Dam, is only 35% of the entire flow that reached the lower valley. We do feel, however, that there is sufficient margin of regulation to control the quantity of water that will prove dangerous at the peak flood time. . . . We cannot believe that a solution is impossible. This danger is acute; this large amount of snowfall is bound to come off during the next 90 days. If sufficient storage can be made available, it does seem that disaster might be averted. We ask you for your help and co-operation.

(Source: [4/4/46 CT](#))

### Major Projects Planned For Seattle City Light

A major six-year construction program involving the expenditure of an estimated 50 million dollars has been announced by Seattle City Light for its Skagit river project, it was revealed today. . . . The initial project, contract of which is expected to be let soon, calls for considerable tunnel work at the present dam sites, installation of an additional generator at Newhalem and the construction of a camp for workers at Goodell creek, it was learned.

**To Raise Gorge Dam:** Planned for the second phase of the gigantic construction program will be the addition of seven feet to the present Gorge dam and other work at that site. A workers' camp will also be built at a site known as East End. The third phase of the project calls for continuation of present work at Ross Dam, including the construction of 1800 more feet of cement lined tunnels. . . .



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**Local Employment** . . . A large number of men are at present employed at construction work at Ross Dam which is rapidly reaching its maximum height. (Source: [12/18/47 MVDH](#))

### Do The Dams Stop The Floods?

Do the two Seattle City Light dams on the Skagit River assure us that days of Skagit Valley floods are at an end? That is a question of vital interest to all residents of the valley. It can be answered conditionally, especially since the recent freshets that sent the river to within two feet of the level of grave danger.

The provisional answer is that the dams can be, as they have been in the last two weeks, used to hold down flood crests. There is as yet no assurance that they will prove adequate to prevent serious flood rise in all cases, particularly in November or December. . . . But the City Light dams definitely have forestalled serious flood conditions in the current freshet period. At its crest last week, the Skagit reached 21 feet at Mt. Vernon, two feet below the point at which danger of dikes being overflowed or washed out would become serious, Walberg reports.<sup>28</sup> “Ross dam was used to hold back water for ten days,” Walberg told the Argus Wednesday. “It helped keep the river level down by possibly several feet.” As the Seattle Times reported Sunday from an interview with City Light officials, “if the 567,000 acre feet (of freshet waters purposely held behind Ross dam) had been added to the water flowing down the lower Skagit river, after its junction with the Sauk near Rockport, the lower valley probably would be having its flood problem right now,” The lower valley needs to continue to maintain its dikes, and to watch them carefully at freshet time, but at least it has some protection that it once did not have. (Source: [6/10/48 Argus](#))

The Skagit River has again served notice that it has a will of its own and can not be controlled by predictions, weather charts, previous performances or power dams. When conditions are right the Skagit will flood, and the county might just as well prepare its defenses. In the lower valley dikes again held off a major disaster. Their move will be better dikes and allowance for even higher water than has been experienced. Communities such as Hamilton may also have to look into diking projects for protection. The upper valley could well use an emergency road system out of the flood areas, something the county could do easily with a few connecting links in the Lyman-Hamilton area. Also needed is a county budget for flood emergency use and a definite working plan for handling such emergencies. The county engineer’s stepped into the breach and did an excellent job this past week end, but their work could have been greatly simplified if they had funds to work with and rules to follow. Floods may not come often in future years, that is true. But there is little reason why they can’t be included in our planning and be accepted as part of the weather hazard that must be faced. (Source: [2/15/51 C.H.](#))

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<sup>28</sup> Dikes would break when river reached 23 feet at Mt. Vernon?? Important to remember is that was 23 feet at the downtown Mt. Vernon gage at the Moose Hall. That would be approximately 31 feet at current location between Burlington and Mt. Vernon. At 31 ft the Skagit River carries approximately only 90,000 cfs. In the 1990 and 1995 flood events the Skagit reached a gage height of 37.3 feet and carried 152,000 cfs and 141,000 cfs respectively.



## Seattle City Light Promises Flood Control

An all-time record spring runoff is expected from the upper Skagit River for the April-August period, I.L. Cottom, Assistant Superintendent of Seattle's City Light, announced here this week. Snow surveys indicate 16 per cent more snow, on a water content basis, than last spring when a 40-year runoff record was broken. A prepared statement from City Light promised as much control of spring and high water as possible from its Diablo and Ross dams, but advised "construction of and a high degree of maintenance of diking facilities" on the lower river. . . .

During the period May 24 to June 12, 1948, the natural flow of the Skagit river at Diablo dam maintained daily flows ranging from 16,000 cfs to 32,000 cfs which is the highest spring runoff of record at that point on the river. Due to the large storage capacity of the Ross Reservoir, the City of /Seattle was able to store the greatest amount of the runoff and the flows actually released at Diablo dam during this period ranged between 2,500 and 8,000 cfs. Actually 78 percent of the total runoff at Diablo was impounded in the City's reservoirs during this period, which reduced the average flow in the lower reaches of the river by 18,000 cfs.<sup>29</sup>

Between June 9 and June 12 the Skagit River was at or near the 20-foot stage at the county gage at Mt. Vernon, and reached an observed peak stage of 20.3 feet at 7:15 p.m. on June 10. The operations of the City's dams at this time resulted in a net reduction of 211,800 cfs in the natural flow of the river. Assuming that one-third of this flow, had there been no regulation, would have been absorbed in valley and channel storage such as the Nookachamps basin, there would still have been 14,000 cfs greater flow in the Skagit at Mt. Vernon, which would have resulted in a river stage of 22.3 feet instead of the 20.3 feet which actually occurred. . . .

The City of Seattle in describing the effect of the operation of its reservoirs on the flows in the lower river does not wish to convey a false feeling of security against floods in the lower Skagit valley. The most damaging floods have practically always occurred during the winter period from the middle of October to the middle of March. It is desired to emphasize the fact that during winter floods, such as occurred in February 1932 and December 1921, the contribution of the upper Skagit River to this type of flood ranges between 15 and 18 percent. Therefore, even complete regulation of flow in the upper Skagit could only effect peak flows in the lower river by 15 to 18 percent. Until such time as large storage facilities are available on the lower tributaries of the river, such as the Cascade, Sauk and Baker rivers, the possibility of damaging floods in the lower Skagit valley will continue to exist. . . . This statement by the city of Seattle, department of lighting, has been issued in order to inform the residents of the Skagit River Valley of the flood control service that has been and will continue to be rendered by the City in the operation of its hydro-electric projects and reservoirs located on the upper reaches of the Skagit River. (Source: [5/5/49 Argus](#))

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<sup>29</sup> This statement begs a very important question. If Seattle City Light was able to use Diablo as flood control in 1949, why can't they utilize Diablo for flood control in the 21<sup>st</sup> Century?



## Historical Dam Building And Their Impacts on the Floods Of The Skagit River

### Operation of Baker, Diablo and Ross Dams

The information from the surveys completed through the joint efforts of the U.S. Geological Survey, the Dominion Water and Power Bureau of Canada, the Forest Service and Soil Conservation Dept. and City of Seattle has provided much valuable information in anticipating flood conditions. Last year from May 24 to June 12, the natural flow of the Skagit River at Diablo Dam maintained a flow of from 16,000 to 32,000 cubic feet per second, which is the highest spring runoff of record at that point. This year, due to the large storage capacity of the Ross Dam, the greatest amount of the runoff has been held and flows actually released at Diablo now range between 2,500 and 8,000 cu. ft. per second. Actually 78 percent of the total runoff was impounded. . . . In their statement concerning the possibility of floods, City Light reminds residents of the valley that floods are still possible despite all precautions if weather conditions bring on unusual runoffs. However, most serious floods occur during the winter period from October to March. . . . Flow of the Baker River by the Puget Sound Power dam is also controlled as far as possible by river conditions and release of water from all dams are timed through close cooperation of the power dispatchers.

### Ross Dam and the November 28, 1949 Flood<sup>30</sup>

Seattle City Light's Ross Dam on the upper Skagit played a large part in keeping the serious flood from being even worse, E. R. Hoffman, Lighting Superintendent, said today. The valves in the big dam were closed Wednesday, November 23, and no water from the entire upper river was allowed to pass. From Thursday midnight until Sunday midnight enough water was held behind the dam to cover 116,000 acres of land to a depth of one foot. At the crest of the flood approximately 42,600 cubic feet of water were impounded every second. Elevation of Ross Lake, nearly 20 miles long, came up ten feet, and is now forty feet higher than anticipated for this time of year. On November 28 there was still enough storage space to impound another 200,000 acre feet of water behind Ross Dam.<sup>31</sup> The valves were still closed and no water was getting past the dam. The flood crest at Concrete, first large town below Ross Dam, reached 149,000 cubic feet per second on Sunday, November 27. This would have been disastrously worse except for the water held behind Ross Dam. The crest passed Mt. Vernon early Monday morning, November 28, and the entire river was reported to be receding. "Ross Dam does a great deal to keep floods on the Skagit from being much worse", Hoffman said. "However, it cannot be expected that a dam so far up the river will prevent floods altogether. "Only about one-fourth of the river lies above Ross Dam, and the tributary streams feeding the upper fourth are a good deal smaller than the streams below the dam."

Heavy rains and unseasonably warm temperatures combined with other factors over the week end in causing the first serious flood on the Skagit river in many years. Although the river was high for several days, the rapid rise of the river Saturday night and Sunday morning caught most residents living near the river by surprise. The real cause of the flood was the unusually

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<sup>30</sup> USGS 154,000 cfs Concrete (40.8), 149,000 cfs Sedro-Woolley, 114,000 cfs Mt. Vernon (34.21)

<sup>31</sup> If this statement is true, and they indeed did provide 116,000 acre feet of storage and still had another 200,000 acre feet available, then why is it that they currently only provide 120,000 acre feet of flood control storage?



## Historical Dam Building And Their Impacts on the Floods Of The Skagit River

heavy rainfall during the week, when **11 inches fell on the upper Skagit between Tuesday and Sunday**. During the storm that hit here Saturday, **four inches of rain fell in 24 hours**. This, combined with a Chinook wind and the already bank-full river, brought the water up at a rapid rate starting early Saturday evening. By 2:00 a.m. Sunday water had started to enter the town of Hamilton and by morning there was from two to four feet of water over the entire town. . . . All traffic to the upper valley was closed Sunday by water over the road at Lyman. Before that a few cars had been able to get thru by detouring Hamilton by way of the Lyman Timber Co. road to Grandy Lake. . . . The fact that **water was low behind Ross dam** kept the flood from being much worse. The valves of the dam were closed Wednesday and the **dam was able to hold back all water here until the flood crest had passed**. At the crest of the flood 42,600 cubic feet of water were impounded every second. The **lake**, over 20 miles long, **came up ten and is now forty feet higher than anticipated for this time of the year**. Monday there was still enough storage space to impound another 200,000 acre feet of water. No water is being released. . . . The **Baker River dam here held back the rising Baker River until late Saturday evening, when storage capacity was reached**. The water was then released at a minimum rate, keeping the lake level at full height. The Sauk River, uncontrolled, was a big factor in the rapid rise of the river here. The flood crest here Sunday reached 149,000 cubic feet per second. (Source: [12/1/49 C.H.](#))

### Baker Dam Storage During November 26, 1950 Flood

Almost exactly one year from the date of the worst flood in the past 30 years on the Skagit River, warm rains and wind combined to give the folk along the river banks another bad scare. The water rose to a crest of 21.6 feet at Mt. Vernon Sunday, but did little damage. The crest a year ago was 26.5 ft. In the upper valley ferries had to cease operation for a short time and water did cover the road for a while at the slough just below Hamilton. The Baker dam was able to hold back a good share of the raise in the **Baker River, only 14 gates being opened** to hold the flow level. High water continues, though the river is dropping somewhat. The run-off will ease the flood situation considerably.<sup>32</sup> (Source: [11/30/50 C.H.](#))

### Ross Dam Storage in November 1955 Flood

Ross Dam again helped reduce flood damage in the lower Skagit Valley during the high water recently by holding back 66,000 acre feet of water. The flow of water was reduced Monday, October 24 and completely shut off the following day until 5:00 p.m. to reduce the flood waters. The shut down cost City Light about \$11,000 in electricity that had to be purchased from Bonneville and Tacoma City Light. (Source: [11/17/55 C.H.](#))

### Ross Dam Stores 900,000 Acre Feet Of Storage

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<sup>32</sup> No reading for Concrete by USGS. Mt. Vernon reached 68,400 cfs or 28.19 on gage which by this time had been moved to the bridge between Burlington & Mt. Vernon. Old gage reading would have been approx. 20 feet at the Moose Hall. Baker Dam a player on lessening flood flows.



## Historical Dam Building And Their Impacts on the Floods Of The Skagit River

Ross Lake is being kept at a reduced level in order to hold back some of the heavy runoff anticipated for the next few months, City Light Executive Assistant Superintendent John M. Nelson reported today. Ross Reservoir on the upper Skagit River is down to about 100 feet below full level, providing a storage space of about 900,000 acre-feet of water.<sup>33</sup> Snow surveys made April 1 indicate that the runoff of the upper Skagit River will be the highest in 27 years for the period April 1 to August 31. The 900,000 acre-feet of storage space in Ross Reservoir represents about 1/3 of such runoff thus allowing a substantial amount of storage with which to reduce the discharge of the upper Skagit during the peak flows in the lower reaches of the river. (Source: [5/3/56 B.J.](#))

Ross Lake is now being kept at a level about 100 feet below the full mark in order to hold back some of the heavy run-off expected from melting snow in the next few months. Ass't. Supt. John Nelson reports that the water level as held at present will provide the storage space for about 900,000 acre feet of water. Snow surveys made April 1<sup>st</sup> showed that the run-off of the Skagit will be the highest in 27 years during the period from April 1<sup>st</sup> to August 31<sup>st</sup>. The 900,000 acre-feet of storage space in the Ross reservoir represents about one-third of such a run-off, which allows a substantial amount of storage with which to hold back the flood peaks on the lower river. (Source: [5/3/56 C.H.](#))

### Seattle City Light Makes It Rain

City Light has announced that Seattle City Light, in an effort to cut down on its power purchases, has signed a rain-making contract with the Water Resources Development Corporation of Denver, Colorado. The contract extends from now to the end of August. ... Past experience of the Water Resources Development Corporation, shows that their operations have increased rainfall 10 to 20%. ... The activities will be centered back of Ross Dam so that any additional rainfall will drain into Ross Lake where it can be stored. (Source: [5/1/58 C.H.](#))

A six-month experiment designed to drench the Skagit Valley and make its river work harder will end this week. It will be another six months before state officials know how much extra effort they got from the stream. Stuart Shumway, weather-modification supervisor for the conservation department, has been in the Upper Skagit River basin since October, directing a dozen rain-making machines. The rain makers are ground-based generators that spray silver iodide solution into passing storm clouds. The silver-iodide particles have the effect of ice crystals, causing water vapor to gather around them and descend as rain. "We hope we've increased the water runoff in the valley by 15 per cent," Truman Price, conservation's supervisor of power resources said yesterday. "But we won't know for certain until the runoff is finished next fall." (Source: [4/30/64 C.H.](#))

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<sup>33</sup> They dropped the level of the lake 100 feet. Under current conditions Seattle City Light only lowers the lake 10 feet for flood control. And this is in the best interest of the people of Skagit County how?





## Dams and the November 24, 1959 Flood Event<sup>34</sup>

Skagit County was not without its high water hard work and individual hardships this week but it could thank a gentler weather man up this way, the Skagit and Baker river dam operators, and the various dike builders, that this area escaped the disaster that befell Snohomish and other counties. . . . Residents of the Nookachamps area took scant solace from the situation, after suffering two backups from the Skagit and seeing many of their farms once more flooded. .

Seattle City Light's Ross plant was partially shut down from Thursday morning, Nov. 19, to Monday noon of this week to reduce the amount of flood waters in the lower Skagit, Supt Paul Raver advised the Argus. Flow at Ross was cut to the point where even with the additional water from streams feeding into the Skagit below Ross, no water was spilled over the Gorge diversion dam. The only flow permitted at Newhalem was the normal amount necessary to operate the Gorge power house. During the Thursday-Monday period level of Ross Lake increased 2.33 feet, or by 26,000 acre feet of water. Raver said power was cut by about 6,000 acre feet and the lost power replaced by purchase or interchange of about three million kilowatt hours of energy.

A like contribution to Skagit Valley flood protection was made by Puget Sound Power and Light Company with its two dams on the Baker River, one in use this winter for the first time. Division Mgr. John Wallen in Bellingham reported to Mt. Vernon Mgr. Loft that Puget also began holding back water early last Thursday and stored 27,000 acre feet of water that ordinarily would have gone on downstream. It closed gates to raise the level at Upper Baker by 5 ½ feet and at the old Lower Baker dam at Concrete, another foot.<sup>35</sup> By terms of the federal power commission license, the company is not required to use the Baker dams for flood control but was glad to be able to do so, Wallin said. (Source: [11/26/59 Argus](#))

Seattle City Light's Ross Dam has again helped control the flow of the Skagit River during flood conditions. Supt. Paul Raver has revealed that Ross plant had been partially shut down from Thursday morning, November 19, to Monday noon, November 22, to reduce the amount of flood waters in the lower Skagit river. Flow at Ross Dam was cut down to the point where even with the additional amount of water from other streams feeding into the Skagit river below Ross, no water was spilled over the Gorge Diversion dam. The only flow at Newhalem was the normal amount necessary to operate the Gorge Powerhouse. Water flow at Ross plant was reduced Thursday morning and not increased until some hours after the flood crest had passed. In the interval the level of Ross Lake went up 2.33 feet (from elevation 1584.36 to 1586.69 feet). This amounted to 26,000 acre feet of water. Actual storage of flood waters was much greater as under normal conditions City Light would have drawn down about 6,000 acre feet to produce the power to carry the Seattle load. (Source: [12/3/59 C.H.](#))

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<sup>34</sup> USGS figures show 89,300 cfs at Concrete or 32.17 ft river; 91,000 cfs at Sedro-Woolley; and 91,600 at Mt. Vernon or 31.58 on gage. The 91,000 cfs at Sedro-Woolley is highly suspect as overbank storage in the Nookachamp/Sterling basins should have greatly lowered the reading at Mt. Vernon.

<sup>35</sup> This is interesting from the standpoint that no storage was required behind the Baker Dams in 1959 however; Puget Sound Power & Light voluntarily provided flood control behind both Upper and Lower Baker Dams. This certainly begs the question of why can't they provide storage behind Lower Baker in the 21<sup>st</sup> century. Clearly this article shows the benefit of providing that storage.



### Upper & Lower Baker Dams Help In Flood Control

The 9.6 inch rainfall on the Baker district on January 14-15 resulted in a seven-foot rise in the water level behind the Upper Baker Dam. The dam held back about 9.7 billion gallons of water, helping to avert a flood on the Skagit River. Records show that during the week ending January 20<sup>th</sup> the run off raised the Upper Baker reservoir 16 feet and the Lower Baker three feet containing a total of about 67,000 acre feet. The total storage of the two is equivalent to 34,000,000 kwh. (Source: [2/2/61 C.H.](#))

### Ross Dam Helps Control Skagit November 1962 Flood

City Light last week released a report of the work of the Skagit projects during the flood situation on November 19<sup>th</sup>. Ross Dam was shut down from early Monday evening, Nov. 29<sup>th</sup>, at 9:30 p.m. and not reopened until 2:00 on Tuesday to hold back some of the abnormal river flow. The power was replaced on an interchange basis from Bonneville and Pries Rapids dams which furnished 639,000 and 264,000 kw, respectively. The Ross station showed a rainfall of 4.41 inches from 8:00 a.m. to midnight Monday. The Dalles gauge registered a stream flow of 114,000 cfs per second from 7:00 a.m. to 9:00 a.m. Tuesday. A flow of 90,000 cfs is the point at which Ross Powerhouse operators are alerted to flood control action. (Source: [12/6/62 C.H.](#))

### False Sense Of Security

On the other hand there have been no disastrous floods in the lower Skagit Valley since the completion of the Ross Dam in 1949. During flood periods, the Ross Plant has been shut down, sometimes entirely, to hold back the greatest possible amount of water. In 1949, from Thursday midnight until Sunday midnight, enough water was held behind the dam to cover 116,000 acres of land to a depth of one foot. At the crest of the flood approximately 50,000 cubic feet of water was impounded every second. Although the dam was built primarily for power production, it had appreciably reduced the flood threat in the lower Skagit. (Source: [11/14/63 B.J.](#))

### New Dams Proposed

Means to secure better flood control protection from uncertain waters of the Skagit River, a problem which has bothered Skagit county residents since the first settlers arrived, were again thoroughly considered at the June meeting of the Skagit County Planning council held at the Skagit county courthouse Monday night. ... The three plans which received the most discussion were:

1. The proposed Avon by-pass which would carry off surplus flood water from the Skagit River, from either a point north of Avon or from a point near the southeast corner of the Burlington City limits;
2. The proposed Sauk River Dam;



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### 3. The proposed Faber Dam.

... Means of financing any of the proposals proved another troublesome problem. A strictly flood control dam was deemed non-feasible although a multi-purpose dam with power interests assisting in construction costs was felt possible. (Source: [6/8/44 C.H.](#))

The Avon bypass flood control project should be under construction by 1968, George Dynes told the Skagit County Flood Control council at its annual meeting at the courthouse in Mount Vernon Wednesday night. . . . Dynes said he understood the U. S. Engineers had tentatively selected a site for the first of two Skagit river tributary dams that at some future time would be built to provide protection against a “100-year” flood. This site, about two miles from Rockport, would be for a 150-foot high dam across the Sauk river that would back water all the way to Darrington. The other dam would be on the Cascade river. (Source: [10/29/64 Argus](#))

### Slides Wreck Lower Baker Dam Powerhouse

Massive slides roared down on the Lower Baker Dam at Concrete early today, virtually destroying the power house and causing damage conservatively estimated at more than a million dollars. . . . Other slides roared down later and apparently took most of the power house with them. . . . Heavy weekend rains probably caused today’s massive slides, company officials said. . . . At Burlington, Cleon Cornish, dispatcher for Puget Power, said all reports indicated the slides were “tremendous.”<sup>36</sup> (Source: [5/19/65 SVH](#))

A mudslide from the 300 foot bank behind the Baker River powerplant smashed through the plant carrying part of the structure into the Baker River and causing an estimated \$1 million worth of damage. Minor slides continued to rumble all day Tuesday as loose dirt fell from the hillside carrying with it trees and other debris. (Source: [5/20/65 B.J.](#))

### Ross and Baker Dams Help With Flood Control in Summer 1967 Flood

After a week of warm weather, melting snow in the hills has brought all streams in the valley up and consequently the Skagit has been carrying the run off. **The City Light dams and Upper Baker and Lower Baker dams here managed to hold the run off for the early part of the run, but all are now at capacity and spilling.** The Skagit has been measured at 27.35 at the Dalles gauge, and 26 feet is considered flood stage. However, although some flooding has occurred at Rockport and at other low points along the river, the main stream has been running bank full and carrying the load well. Weather in the 80’s on Monday sent the gauge up higher but still not to the point where flood damage can be expected in the lower valley. With the steady stream flow no emergency is expected unless a storm and warm rains speed up the run-off of snow from the higher altitudes. (Source: [6/21/67 C.H.](#))

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<sup>36</sup> Compare what is stated here and in the subsequent article to what is described in the [11/19/1896 SCT](#) article.. This is strong evidence that a flood caused by the damming of the “narrow outlet in the Baker Canyon” area by a slide very well could have happened. USGS currently is reporting that the slide did not happen because they can find no evidence of it. Maybe we have to drain the lake to find the “evidence”.



### Storage Behind Upper Baker Proposed

A new flood control development, possibility of having the Puget Sound Power & Light Co. reserve from 22 to 19 feet of its Upper Baker dam storage for flood control use, has been suggested and is now being studied, LeGro divulged.<sup>37</sup> . . . This storage could step up flood protection by as much as 12 cycle years, or to 20 if combined with the lower river dike-channel program. (Source: [2/29/68 Argus](#))

### Ross Dam Stores Water in May/June 1968 Flood Event

Flood control benefits of power dams were demonstrated during the weekend of heavy rains the first of the month when Seattle City Light held back part of the flow of the upper Skagit River. Between midnight Friday, May 31, to 6 a.m., Monday, June 3, City Light held back 112,336 acre-feet of water in Ross Lake because of the near-flooding conditions in the lower Skagit. Power Manager Cas Bradeen reports that Ross Lake rose 9.8 feet during that period. At one time Ross reservoir received approximately 25,000 cubic feet per second flow of water from that part of the Skagit River and its tributaries upstream of the dam. Outflow was kept down to the minimum. (Source: [6/12/68 C.H.](#))

### Conclusion

Clearly the articles quoted from herein show the tremendous impact the Skagit River dams have had on flood flows of the Skagit River. Because of the construction of the dams and the lower levees, flood flows on the Skagit River can hardly be called “natural disasters” any longer. The operation of the dams clearly determines how serious an individual flood event will be. Flood control storage behind the dams is the single most determinate influence on flood flows. Based on the articles reviewed in this paper, it would appear that maximum storage and/or a change in operating procedures would be in the best interest of not only the residents of Skagit Valley but in the interest of the dam owners and the American taxpayer as well.

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<sup>37</sup> Upper Baker currently only provides 16.1 feet of flood control storage and it did not go into effect until 1979.