

Palouse Basin Ground Water Management: A History

Palouse Basin Water Summit
October 2, 2007

Palouse Basin Ground Water Management: A History

- Source Information



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Palouse Basin Ground Water Management: A History

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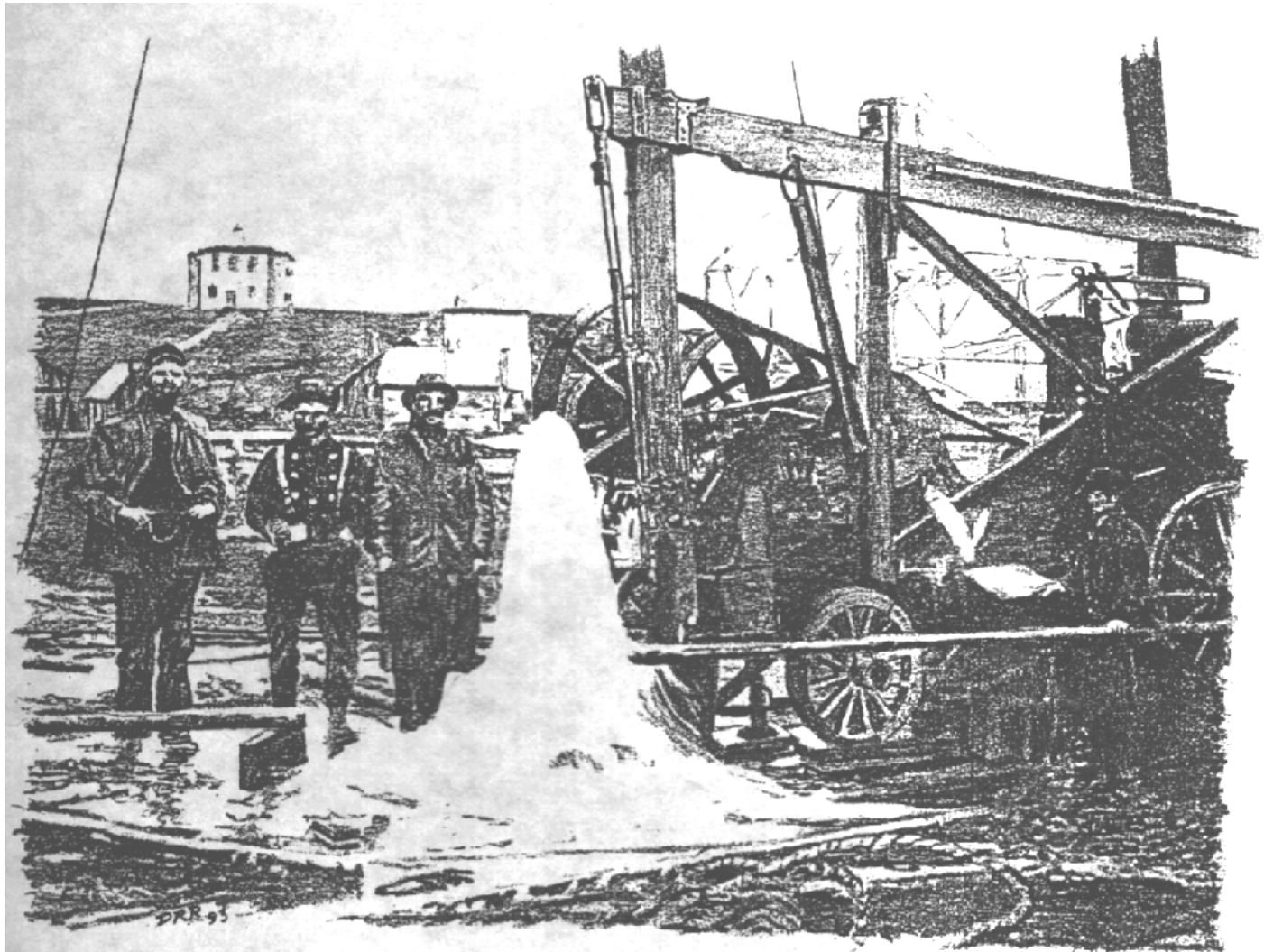
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Vehicle

Palouse Basin Ground Water Management: A History

Water Management Periods

- The Early Days (1890's – 1967)
- Pre-Management Plan (1967 – 1991)
- Post-Management Plan (1992 – present)

Palouse Basin Ground Water Management: The Early Days



Pullman's first artesian well, 1884 (rendered from original photograph).

Palouse Basin Ground Water Management: The Early Days



Palouse Basin Ground Water Management: The Early Days

Several of the wells at Pullman are allowed to flow, thus wasting a large volume of water . . . If the blessings accompanying the discovery of an excellent water supply are to be maintained, all wells should be closed when not in use. (Russell, 1897)

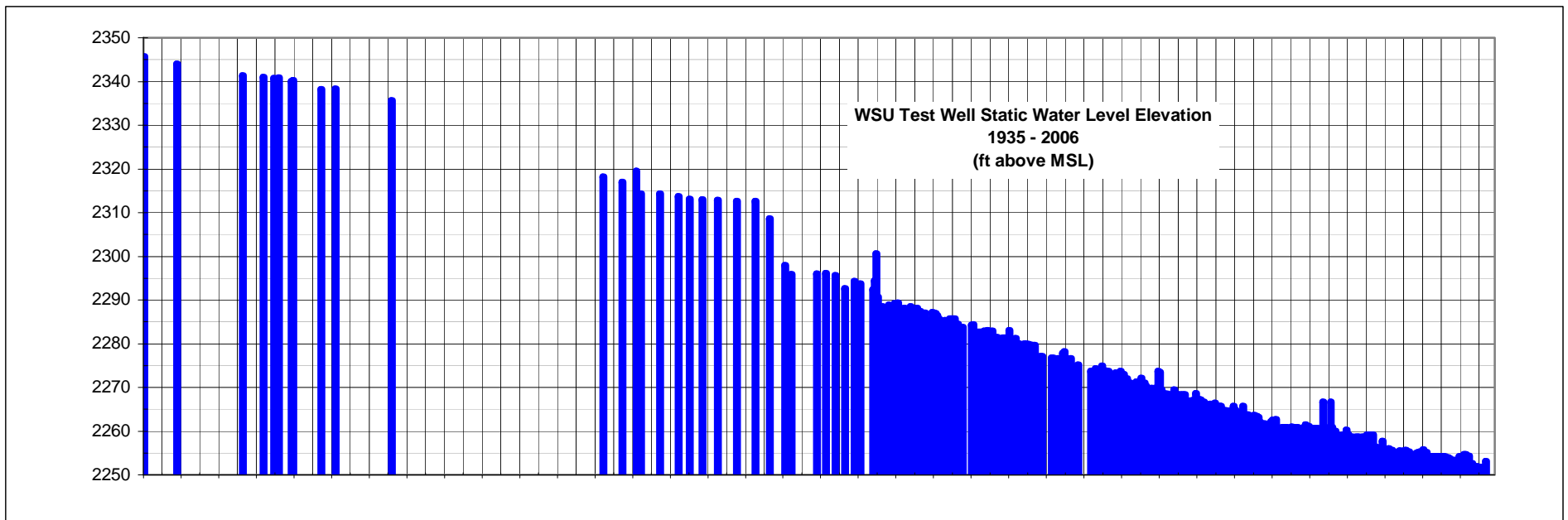
3,000,000
Gallons per Day



Palouse Basin Ground Water Management: The Early Days

Russell - 1897

- 15 wells at Pullman, 11 flowing
- Those with elevation above 2365 ft do not flow



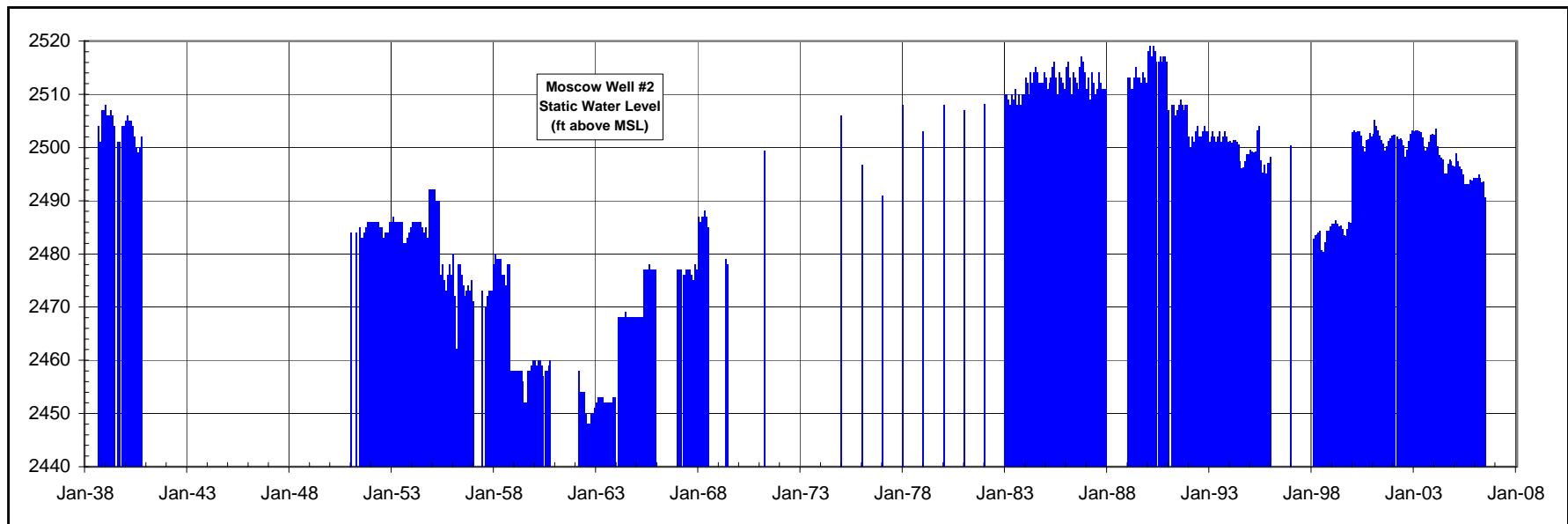
Palouse Basin Ground Water Management: The Early Days

Russell (1897)

- 1891 - 10 flowing wells in Moscow
- 1897 - static level 8 to 9 ft below land surface

Later

- 1923 - static level 44 feet down
- 1962 - static level 120 feet down
- 2007 - Depth to Water, Moscow #2 \approx 75 ft



Palouse Basin Ground Water Management: The Early Days

- 1920

Moscow City Council and Chamber of Commerce request assistance from UI Department of Mines

Transmittal

To the Committee on Water Supply
for the City of Moscow

Gentlemen:

I transmit herewith report by our geologists on the artesian water resources available to the City of Moscow. This presents, in my judgment, a careful, conservative and exhaustive survey of the situation, and the committee is deeply indebted to the gentlemen who have prepared it and especially to Mr. Piper who has labored most diligently in the collection of necessary data and in the preparation of the report and the accompanying maps.

The report indicates that there exists at Moscow a sufficient artesian supply to take care of the needs of the City of Moscow for many years and that by proper means this can be made available for municipal use at reasonable cost; also that the apparently alarming decrease in the pumpage from the municipal wells is found to be due to easily explainable causes and to have but little bearing on the ultimate supply. In these conclusions I concur fully.

I trust that you will find time to study the report thoroughly and to examine its data and conclusions carefully.

Faithfully yours,

Francis A. Thomson
Dean, School of Mines and Secretary,
Bureau of Mines and Geology

Palouse Basin Ground Water Management: The Early Days

- 1920

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Palouse Basin Ground Water Management: The Early Days

- 1937

USGS begins monitoring of water levels

Years	Decline (in. per year)
1936 - 1945	5 - 9
1946 - 1951	21 - 22
1952 - 1955	10 - 13

Pullman

Years	Decline (in. per year)
1937 – 1940	21 - 22
1941 – 1949	11
1950 – 1952	30 – 35
1953 – 1955	50 - 55

Moscow

- 1953

Water supply short – Pullman area curtailment

- 1955

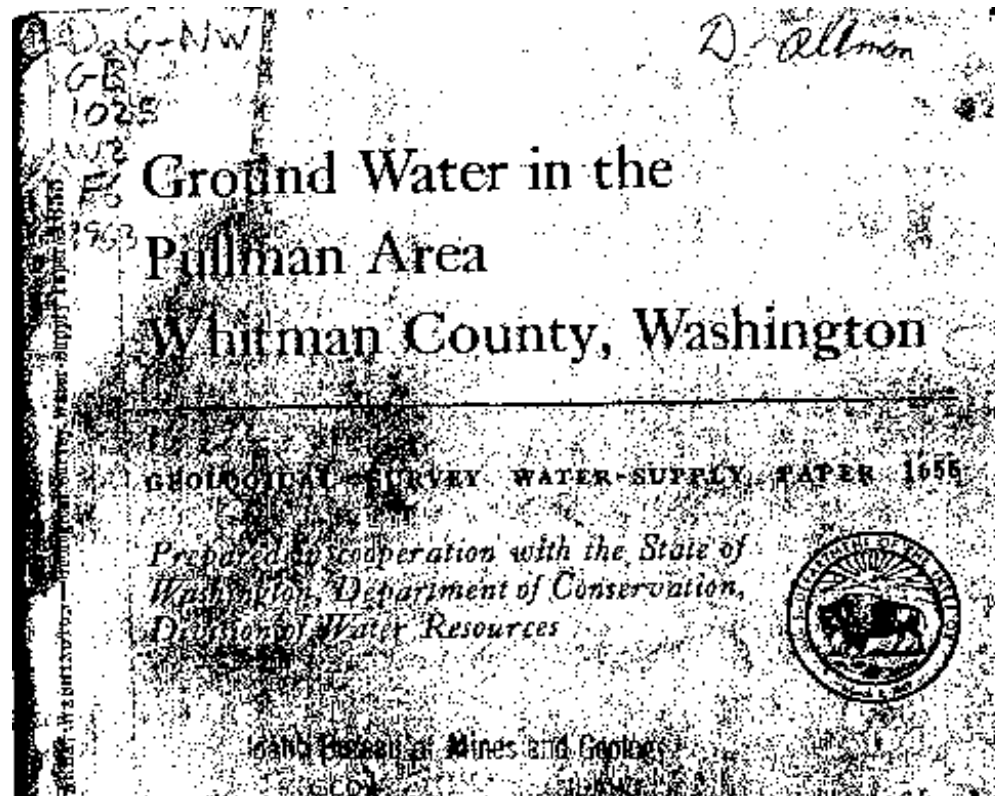
Moscow curtailment necessary

City Council becomes interested in utilizing surface runoff

Palouse Basin Ground Water Management: The Early Days

- 1953 - 1956

Foxworthy and Washburn (reported in 1963)



Palouse Basin Ground Water Management: The Early Days

- 1953 - 1956

Foxworthy and Washburn - Geology

GEOLOGY

9

sand and grit which have considerable influence on the occurrence of ground water in the basin. The weathered material was the source for the sand, silt, and clay beds that are interbedded with the basalt; it is an important aquifer locally along the margins of the basin, where it underlies the basalt on the lower flanks of the crystalline rock hills; and it may act as a conduit through which precipitation on the high bordering hills migrates to the aquifers in the basalt.

Where the uppermost basalt flows about the pre-Tertiary hills, the zone of weathering probably is thin, ranging in thickness from about a foot to a few feet. At most places the contact is covered by loess. Also, much of the weathered material contains appreciable amounts of clay and is only slightly or moderately permeable. These factors limit the effectiveness of the weathered zone as an intake area for ground-water recharge.

Palouse Basin Ground Water Management: The Early Days

- 1953 - 1956

Foxworthy and Washburn - Geology

GEOLOGY

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Palouse Basin Ground Water Management: The Early Days

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. . . we conclude that recharge to the shallow aquifer along the eastern margin of the Palouse Basin is probably limited by thick, low permeability sediments and poor connectivity between the Priest Rapids basalt and the overlying sediments. (Fairley et al 2006)

Palouse Basin Ground Water Management: The Early Days

- 1953 - 1956

Foxworthy and Washburn - Conclusions

CONCLUSIONS

The major conclusions resulting from this investigation may be summarized as follows:

1. Significant differences in the altitudes and rates of decline of artesian levels and in the chemical composition of the artesian water in the two areas indicate that Moscow and Pullman are in two separate hydrologic subbasins, having a common ground-water boundary near the Idaho-Washington border.

2. Two artesian zones in the basalt sequence at altitudes ranging from about 2,170 to 2,290 feet, are by far the most productive aquifers now extensively developed in the Pullman subbasin. Yields as great as 1,800 gpm have been reported from wells penetrating the artesian aquifers, whereas none of the wells in unconfined aquifers have been reported to yield as much as 100 gpm. The artesian aquifers supply more than 95 percent of the total ground-water pumpage in the subbasin.

3. Ground water from the artesian aquifers is, in general, suitable in chemical quality for domestic and stock use and excellent to good for irrigation. However, it is slightly to moderately hard and at some places contains sufficient iron and manganese to stain plumbing fixtures and laundry.

4. For about the last 25 years, the annual discharge of ground water from the artesian aquifers has exceeded the local recharge, and the piezometric surface has declined slightly each year. The pumpage derived from recharge, or replaced pumpage, ranged from about 300 to 815 million gallons per year between 1937 and 1959, and the average for 1949-59 was about 715 million gallons per year, or about 85 million gallons per year less than the average annual pumpage during those years.

The gradual decline of the piezometric surface apparently has caused increased recharge to the artesian zone. However, the present rate of pumping may be slightly exceeding the perennial yield of the aquifers as presently developed.

5. The successful operation of well 15/45-32N2 indicates that potentially good artesian aquifers lie below those now extensively developed. Data collected from that well indicate that the hydraulic properties and the pressure head of the aquifers and the chemical quality of the water they contain should be similar to those of the shallower artesian basalt aquifers. That these deeper zones probably are virtually separate hydraulically from the shallower ones is of great advantage in attempting to develop more water in the Pullman area without aggravating the present incipient overdraft.

6. The most feasible method for artificially recharging the Pullman artesian zone would be by direct injection of water into wells during part of the year and pumping from those wells during the remaining time. The alternate recharging and pumping would decrease the time and cost involved in cleaning and maintaining the wells and would prolong their life. Recharge water is available from several streams, but even under the most favorable conditions it would require treatment for removal of sediment and algae before being injected into a well.

Palouse Basin Ground Water Management: The Early Days

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Foxworthy and Washburn - Conclusions

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Palouse Basin Ground Water Management: Pre-Management Plan

- 1967
Pullman Moscow Water Resources Committee (PMWRC)
- 1969
Alternative Surface Water Study (Palouse, Snake R)
- 1976
PMWRC becomes inactive, with recommendations . .
- 1979
Barker Study (USGS)
- 1982
Crosby (WSU) oral report - projections vs. actual
- 1984
Crosby death prompts reconvening
- 1987
IDWR concerned about possible “mining”
PMWRC reactivated
- 1988
Membership extended to Latah and Whitman Counties
- 1989
Resolution of Understanding (PMWRC, IDWR, WDE)
- 1992
Ground Water Management Plan / Interagency Agreement

Palouse Basin Ground Water Management: Pre-Management Plan

- 1967

Pullman Moscow Water Resources Committee (PMWRC)

BOR Reconnaissance Appraisal (4 plans)

- 1969

How Long Will the Water Last? (Jones and Ross)

-17-

<u>Billions of Gallons</u>			
<u>Artesian Zones</u>	<u>In Storage 1965</u>	<u>Consumption 1965-2000</u>	<u>In Storage 2000</u>
Upper	36.9	?	?
Middle	86.7	10.5	76.2
Lower			
Minimum	184.0	39.6	144.4
Optimum	252.8		223.2
Totals, Middle and Lower Zones			
Minimum	270.7		220.6
Optimum	349.5	50.1	299.4

The water in storage is adequate to meet the needs of Moscow Basin past the year 2000. Pumping levels in wells will be 50 to 80 feet deeper in the year 2000. The 220 to 300 billion gallons remaining in storage at the year 2000 should meet the needs of the basin until at least 2050 and perhaps until 2100.

These figures are based on the assumption that no recharge takes place. If recharge does take place, pumping levels will not be the same as predicted by the models. The affect of recharge, and of other factors, on the model aquifers is still under study.

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Palouse Basin Ground Water Management: Pre-Management Plan

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Palouse Basin Ground Water Management: Pre-Management Plan

- 1969

Status Report

PALOUSE RIVER BASIN STUDY
STATUS REPORT
September 1968 - September 1969

The September 1968 Status Report outlined the findings of Phase I, or preliminary, studies. It was noted that two alternative reservoir sites on the North Fork Palouse River, Harvard and Laird, were to be investigated further. Reservoirs would be multipurpose, with the principal function to be municipal water supply for the Moscow-Pullman area. Secondary functions would be flood control, recreation, and water quality control.

Studies during the past year were directed towards obtaining more detailed information for use in project formulation. A description of the specific studies and comments on the findings follows:

1. Early in August 1968 we met with representatives from the U. S. Forest Service, Bureau of Outdoor Recreation, and fish and wildlife agencies to discuss the recreational and fish and wildlife aspects of the Harvard and Laird sites. Reports from these agencies indicate that either site would have important recreation benefits. The Forest Service stated that they would be able to sponsor the recreation features of the Laird site, but recommended that a state or local agency sponsor this feature of the Harvard site. A preliminary report by the BOR indicates that the recreation benefits from either site would be of the same magnitude, and that the benefits would not vary much for the size of reservoirs under consideration.

2. In October 1968, Professor C. C. Warnick of the University of Idaho questioned our estimates of annual runoff as being too conservative.

Palouse Basin Ground Water Management: Pre-Management Plan

- 1969

Status Report

FPI study has been initiated on Paradise Creek, which will cover the reach between the mouth and the state line.

6. Foundation exploration and mapping of the Harvard damsite were completed. Estimates of water supply (runoff) at the Harvard and Laird sites have been revised. Cost estimates for the Harvard site have been revised, based on the results of foundation explorations, and a review of the Laird cost estimates is underway. Cost versus yield relationships for the Harvard site have been prepared, and project formulation studies have been initiated.

7. We have been advised by the Bureau of Reclamation that irrigation benefits would be realized from reservoir storage on the North Fork Palouse River. The unit value assigned to irrigation water will determine the optimum reservoir capacity.

8. Monetary benefits for water quality control, other than downstream fishing, have not been established.

9. The results of the studies during the past year (September 68-69) have not materially changed the concepts regarding municipal water supply. The findings of the groundwater investigation were inconclusive. The various agencies and geologists consulted have differing opinions on its feasibility; however, the consensus is that groundwater would only be a temporary solution. The Snake River is the least costly surface source that will assure a dependable, long-range supply. The benefits creditable to a reservoir on the North Fork Palouse River will be the difference in pumping and pipeline costs between the North Fork and the Snake Rivers.

Palouse Basin Ground Water Management: Pre-Management Plan

- 1969

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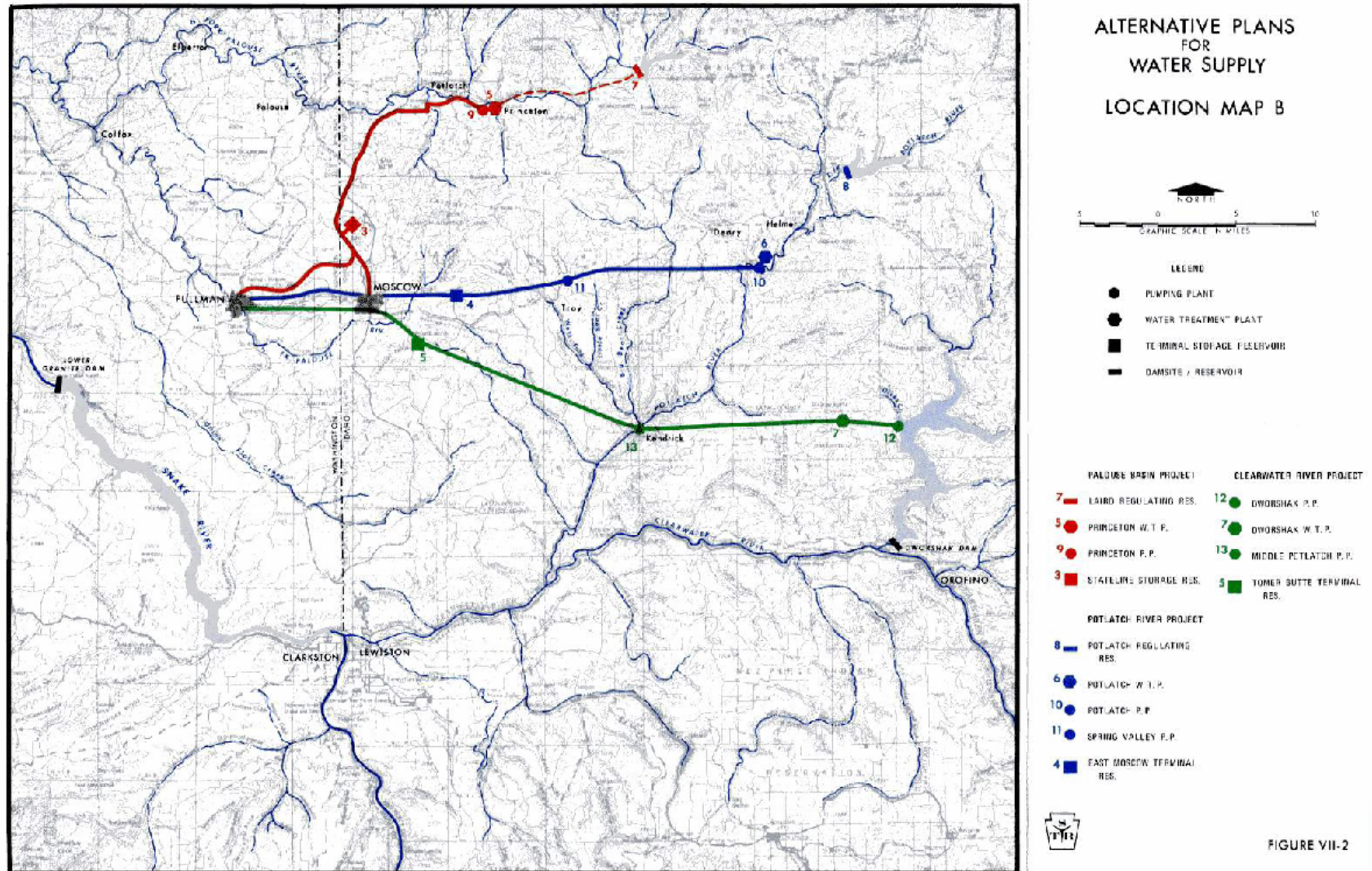
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Palouse Basin Ground Water Management: Pre-Management Plan

• 1970

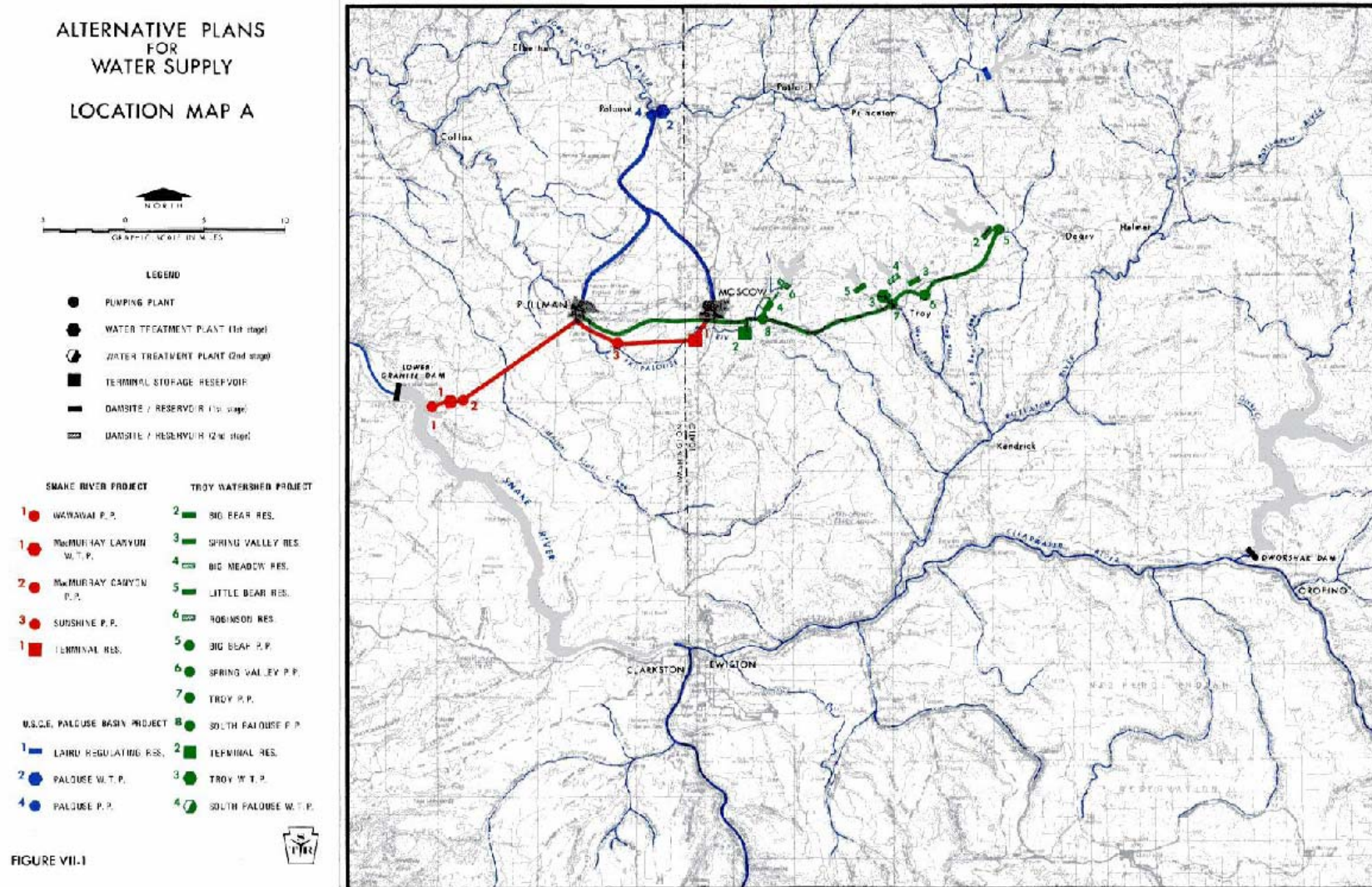
Water Supply Study (6 potential projects)



Palouse Basin Ground Water Management: Pre-Management Plan

• 1970

Water Supply Study (6 potential projects)



Palouse Basin Ground Water Management: Pre-Management Plan

- 1970

Water Supply Study (6 potential projects)

TABLE 7-8
SUMMARY OF MAJOR FACILITIES

<u>Facility and Construction Staging</u>	<u>Potlatch River</u>	<u>Clearwater River</u>	<u>USCE Palouse Basin</u>	<u>Snake River</u>	<u>Palouse River Basin</u>	<u>Troy Watershed</u>
Dam & Reservoir						
First Stage	22,000 AF (1)	None	70,000 AF (1)	None	15,000 AF (1)	22,700 AF (2)
Second Stage						13,260 AF (2)
Third Stage						4,250 AF (1)
Pipelines						
First Stage	20 miles	31.5 miles	24 miles	27.5 miles	31 miles	33 miles
Second Stage				19 miles		9.5 miles
Third Stage	20 miles	31.5 miles			9.5 miles	2 miles
Treatment Plants						
First Stage	15 mgd	15 mgd	15 mgd	15 mgd	15 mgd	18 mgd
Second Stage*						
Third Stage*	5 mgd	5 mgd	5 mgd	5 mgd	5 mgd	2 mgd
Pumping Plants						
First Stage	2	2	2	2	2	3
Second Stage*			1	2	1	3
Third Stage*	2	2	1			2
Terminal Storage						
First Stage	25 mg	25 mg	16 mg	16 mg	10 mg	16 mg
Second Stage	11 mg	11 mg		8 mg		
Third Stage	11 mg	11 mg	4 mg		20 mg	14 mg

Palouse Basin Ground Water Management: Pre-Management Plan

- 1970

Water Supply Study (6 potential projects)

TABLE 7-9
SUMMARY OF CAPITAL COSTS (\$1, 000)

<u>Alternative Project</u>	<u>First Stage</u>	<u>Second Stage</u>	<u>Third Stage</u>	<u>First Year Annual Costs</u>
Snake River	\$ 9, 014	\$ 4, 772	\$ 896	\$ 1, 143
Palouse River Basin	\$14, 600	\$ 345	\$ 4, 062	\$ 1, 457
Troy Watershed	\$14, 544	\$ 9, 149	\$ 5, 572	\$ 1, 435
Potlatch River	\$15, 555	\$ 683	\$ 8, 194	\$ 1, 516
Clearwater River	\$14, 498	\$ 683	\$ 9, 506	\$ 1, 556
USCE-Palouse Basin	\$12, 260	\$ 301	\$ 3, 068	\$ 907

Palouse Basin Ground Water Management: Pre-Management Plan

- 1970

Water Supply Study (6 potential projects)

TABLE 7-9
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\$14,682,000 in 1975 \Rightarrow \$58,208,000 in 2006

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Palouse Basin Ground Water Management: Pre-Management Plan

• 1971

PULLMAN, WASHINGTON 99163

COLLEGE OF ENGINEER
RESEARCH DIVISION
ALBROOK HYDRAULIC LABORATORY
(509) 335-4546

June 18, 1971

Dr. Calvin Warnick, Director
Water Resources Research Institute
University of Idaho
Moscow, Idaho 83843

Dr. A. F. Agnew, Director
Water Research Center
Washington State University
Pullman, Washington 99163

Dear Sirs:

As you are aware, the Pullman-Moscow Water Resources Committee has been studying future potential water supply sources for the two communities for several years. About two years ago, the Committee deliberated the feasibility of relying on the groundwater resources in this vicinity to supply future water demands. Because of the many "unknowns" of geologic characteristics and aquifer boundaries and because of the position of the Washington Department of Water Resources (Ecology) and the Idaho Reclamation Department relative to further groundwater withdrawals, the Committee set aside detailed groundwater studies at that time recognizing that they would have to be made at a later date. Reconnaissance studies of surface water sources have been made, and preliminary cost estimates have been prepared for several schemes by a consultant.

Recently, a paper was presented to the P-MWRC by members of WSU Department of Agricultural Economics illustrating the economics of continuing to rely on groundwater pumpage for the next 50 years. Based upon certain development and operating costs, this analysis indicates that it would be approximately half as costly to continue this pumpage as to import surface waters by the least expensive scheme identified even if groundwater level decline was as much as 40 feet per year. This conclusion is subject to some debate on the basis of capital costs, but cost comparison would still favor the pumping procedure. This comes as no surprise to P-MWRC but the analysis is premised on the availability of water in future years at more or less unlimited quantity. Projections of such availability cannot now be made accurately because of the unknowns mentioned above. Such projections have been made for the Moscow subbasin but the P-MWRC feels the procedures here are questionable so that reliability is extremely doubtful.

The present position of the P-MWRC is that the communities should not be placed in the rather untenable spot of deciding yes or no on a surface water alternative on the basis of current information. They must be advised on the reliability of continued groundwater draft so a decision can be made between this and surface water importation with conjunctive use. Prior to that, the P-MWRC must

Palouse Basin Ground Water Management: Pre-Management Plan

• 1971

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Recently, a paper was presented to the P-MWRC by members of WSU Department of Agricultural Economics illustrating the economics of continuing to rely on groundwater pumpage for the next 50 years. Based upon certain development and operating costs, this analysis indicates that it would be approximately half as costly to continue this pumpage as to import surface waters by the least expensive scheme identified even if groundwater level decline was as much as 40 feet per year. This conclusion is subject to some debate on the basis of capital costs, but cost comparison would still favor the pumping procedure. This comes as no surprise to P-MWRC but the analysis is premised on the availability of water in future years at more or less unlimited quantity. Projections of such availability cannot now be made accurately because of the unknowns mentioned above. Such projections have been made for the Moscow subbasin but the P-MWRC feels the procedures here are questionable so that reliability is extremely doubtful.

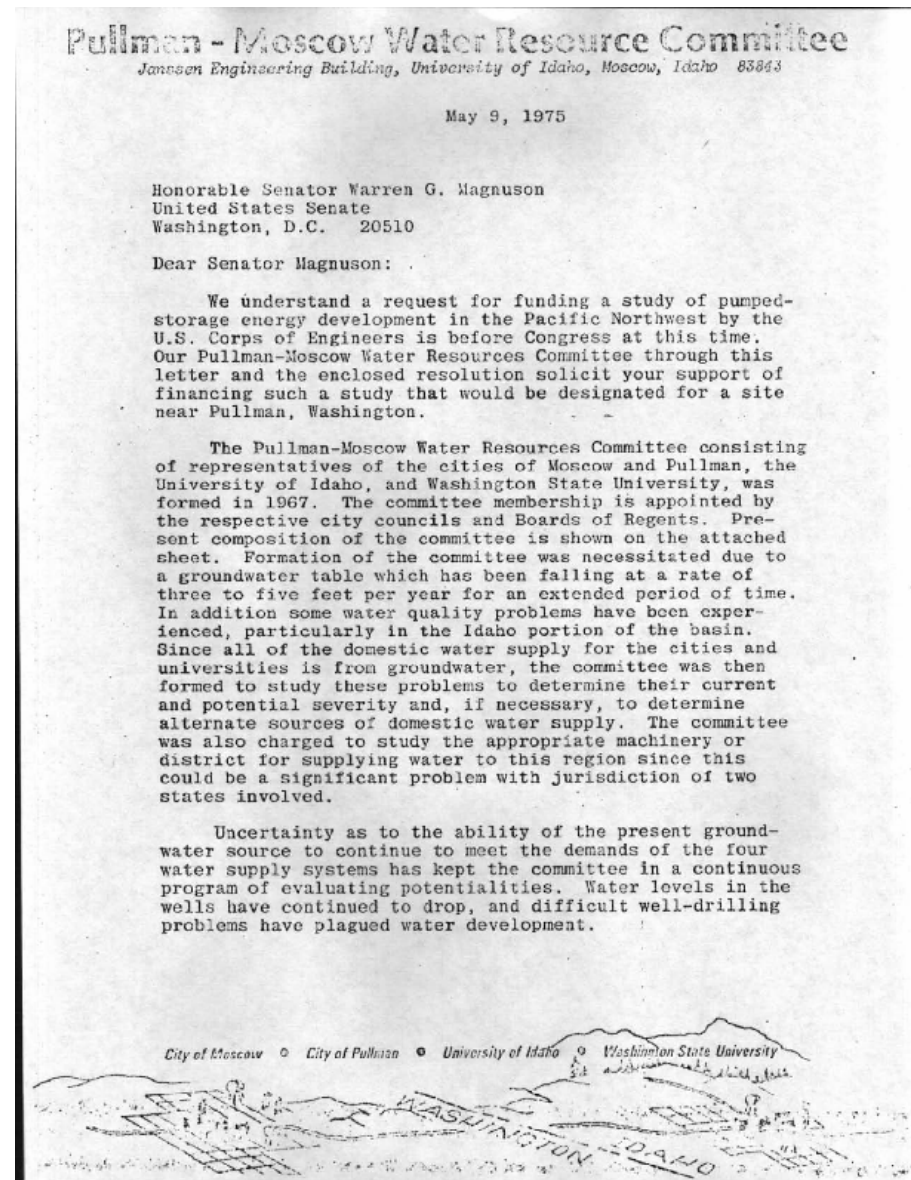
The present position of the P-MWRC is that the communities should not be placed in the rather untenable spot of deciding yes or no on a surface water alternative on the basis of current information. They must be advised on the reliability of continued groundwater draft as a decision can be made between this and surface water importation with conjunctive use. Prior to that, the P-MWRC must

Palouse Basin Ground Water Management: Pre-Management Plan

- 1975 - Pumped Storage Proposal

Identical letters were sent to:

- Rep. Steve Symms
- Rep. Thomas Foley
- Senator Frank Church
- Senator Henry Jackson
- Senator James McClure



Palouse Basin Ground Water Management: Pre-Management Plan

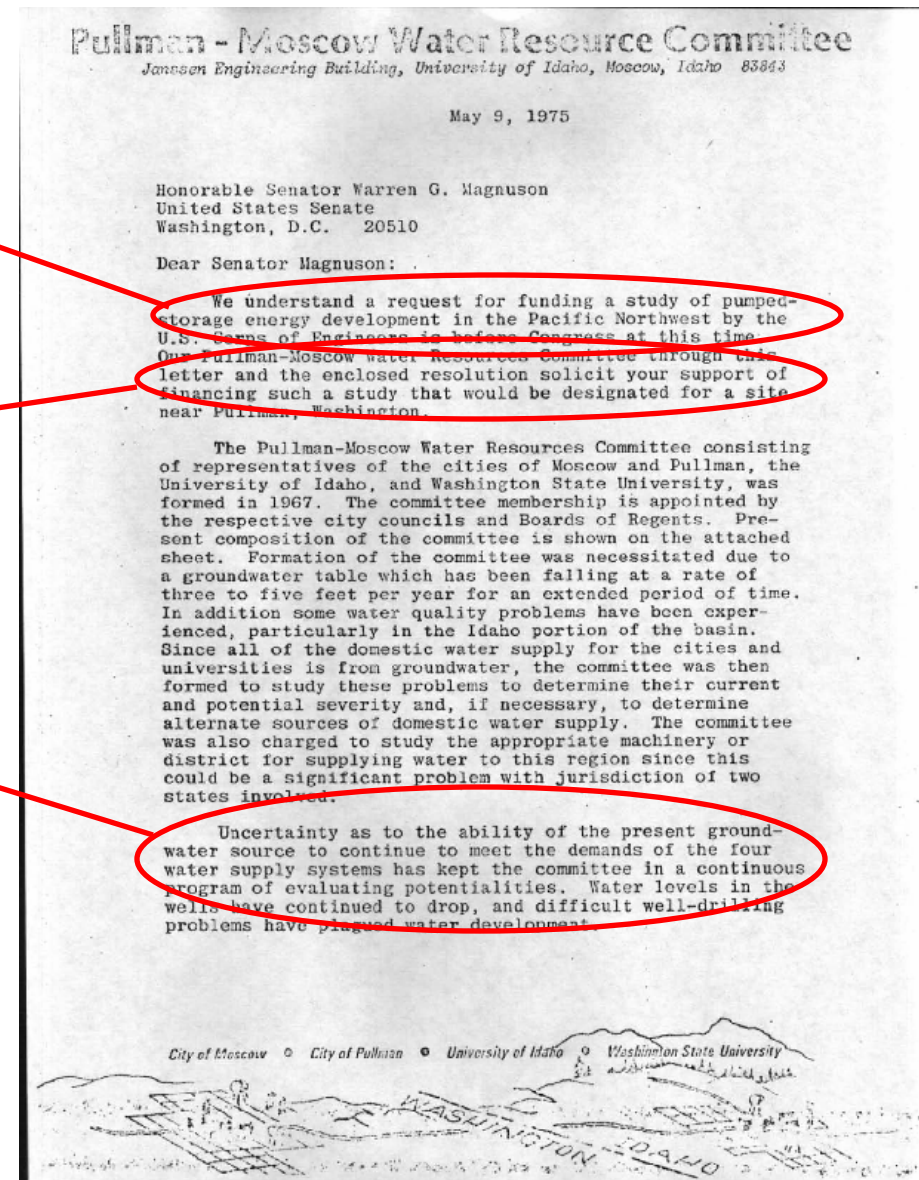
- 1975 - Pumped Storage Proposal

We understand a request for funding a study of pumped storage energy development . . . is before Congress

Our Committee . . . solicit[s] your support of financing such a study

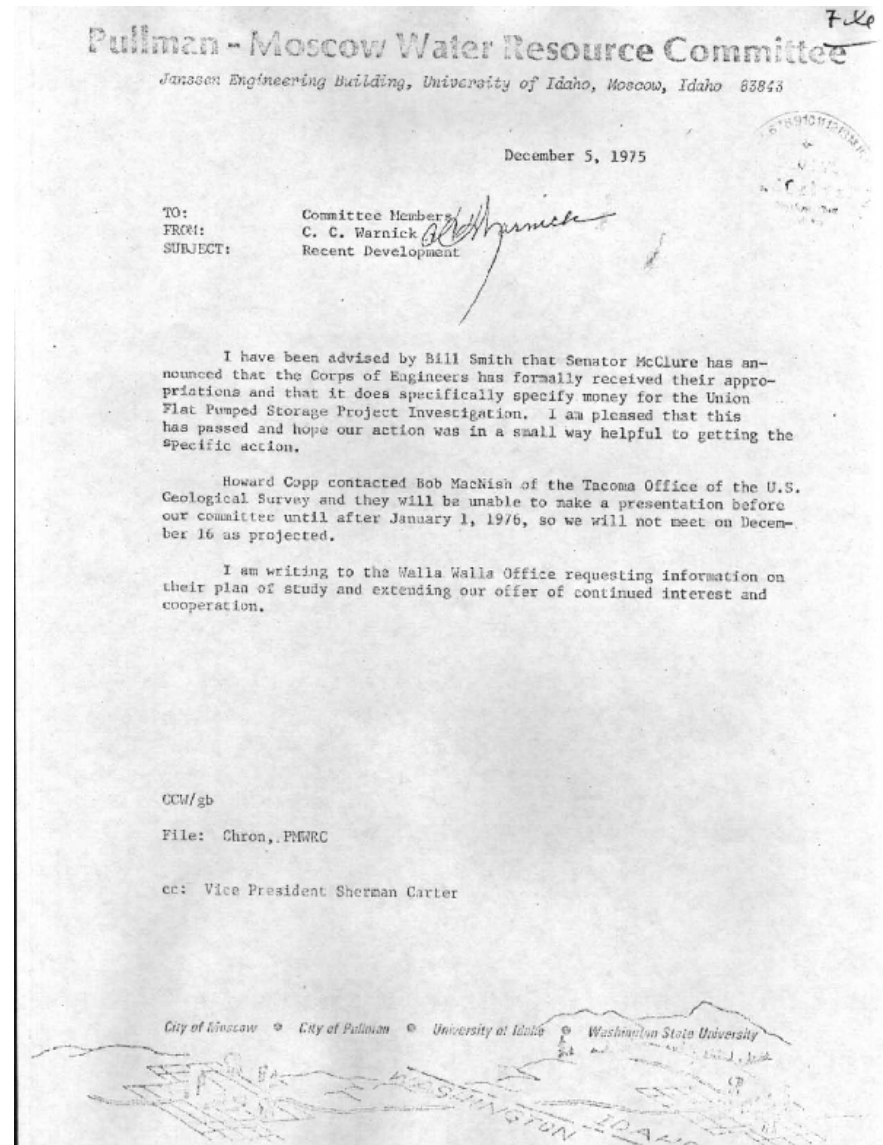
Uncertainty as to the ability of the present groundwater source . . . has kept the committee . . . evaluating potentialities

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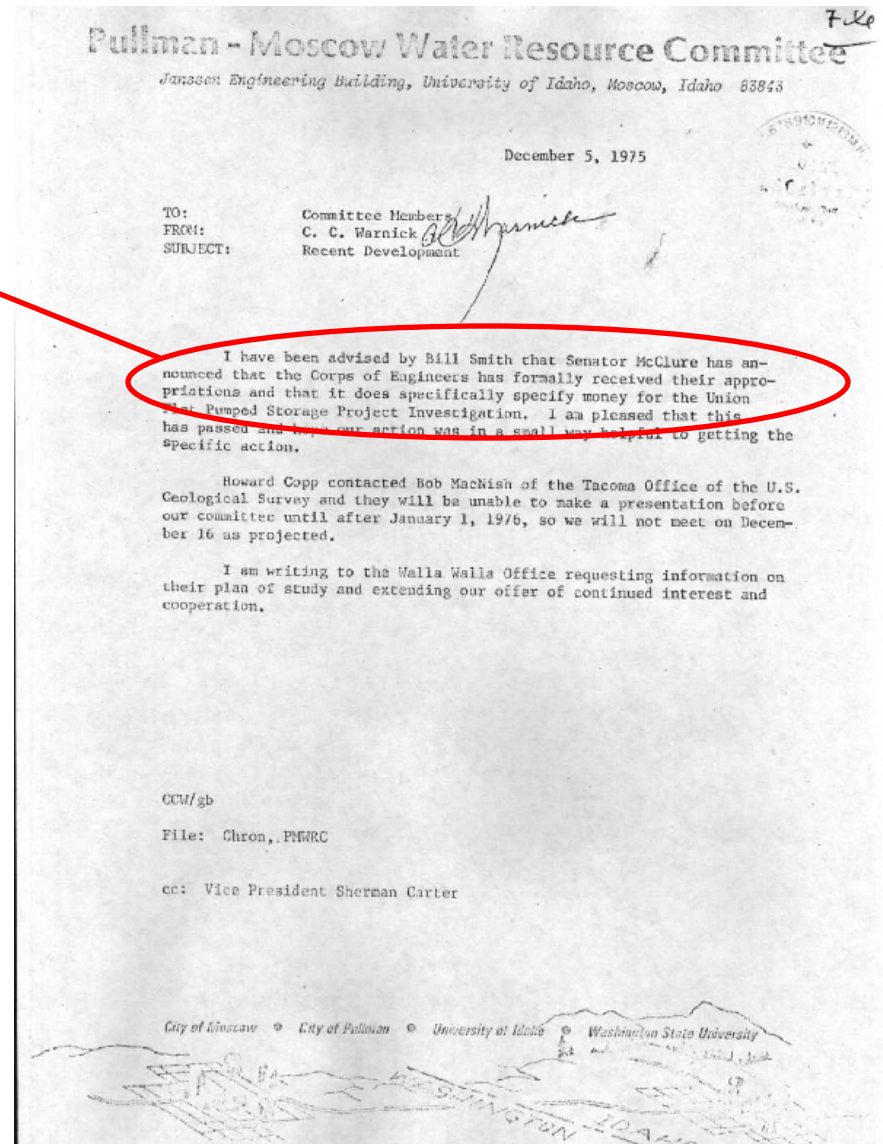
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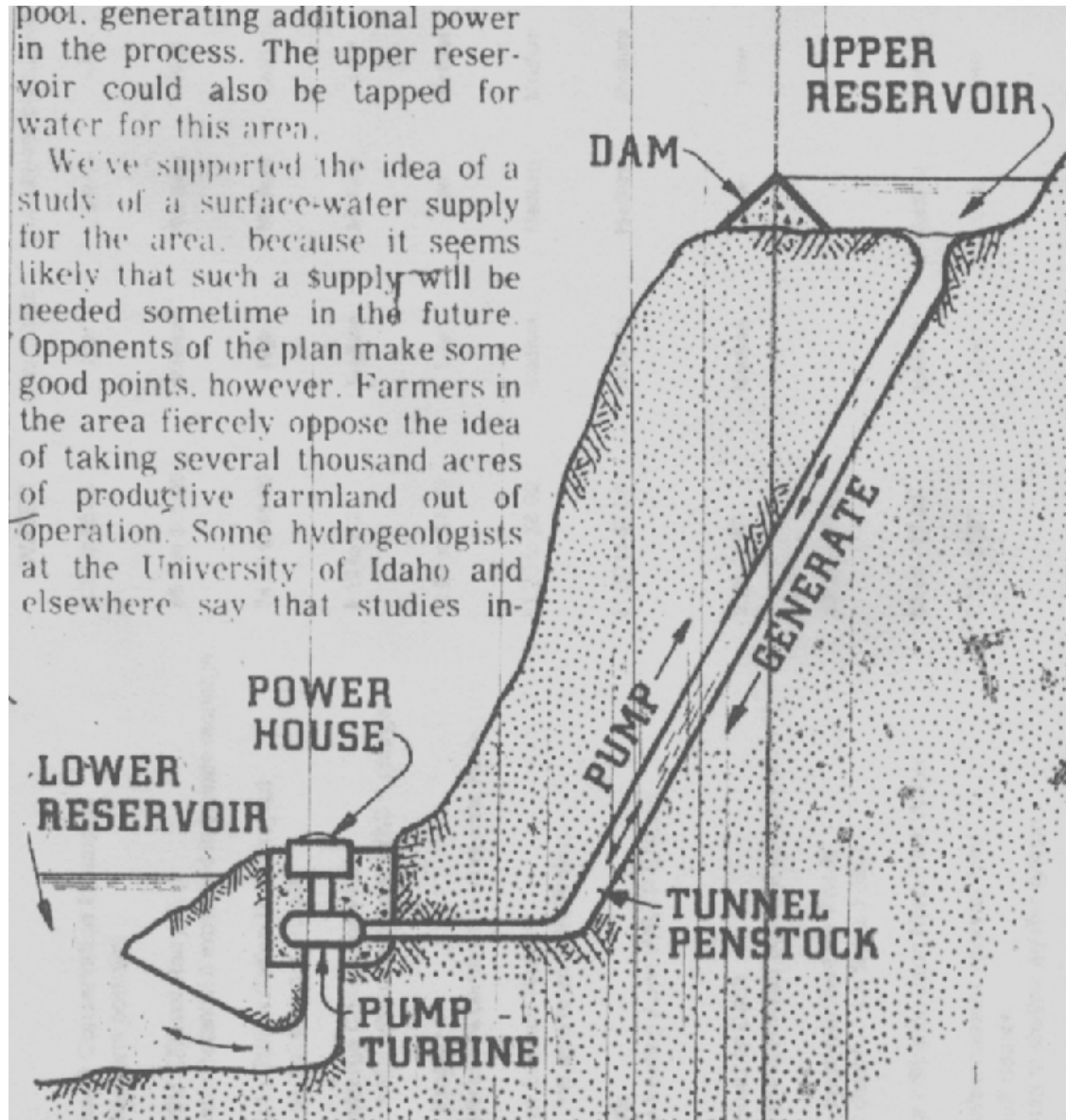
- 1975 - Pumped Storage Proposal

I have been advised . . . that Senator McClure has announced that . . . The Corps of Engineers . . . Appropriation does specifically specify money for the Union Flat Pumped Storage Investigation.



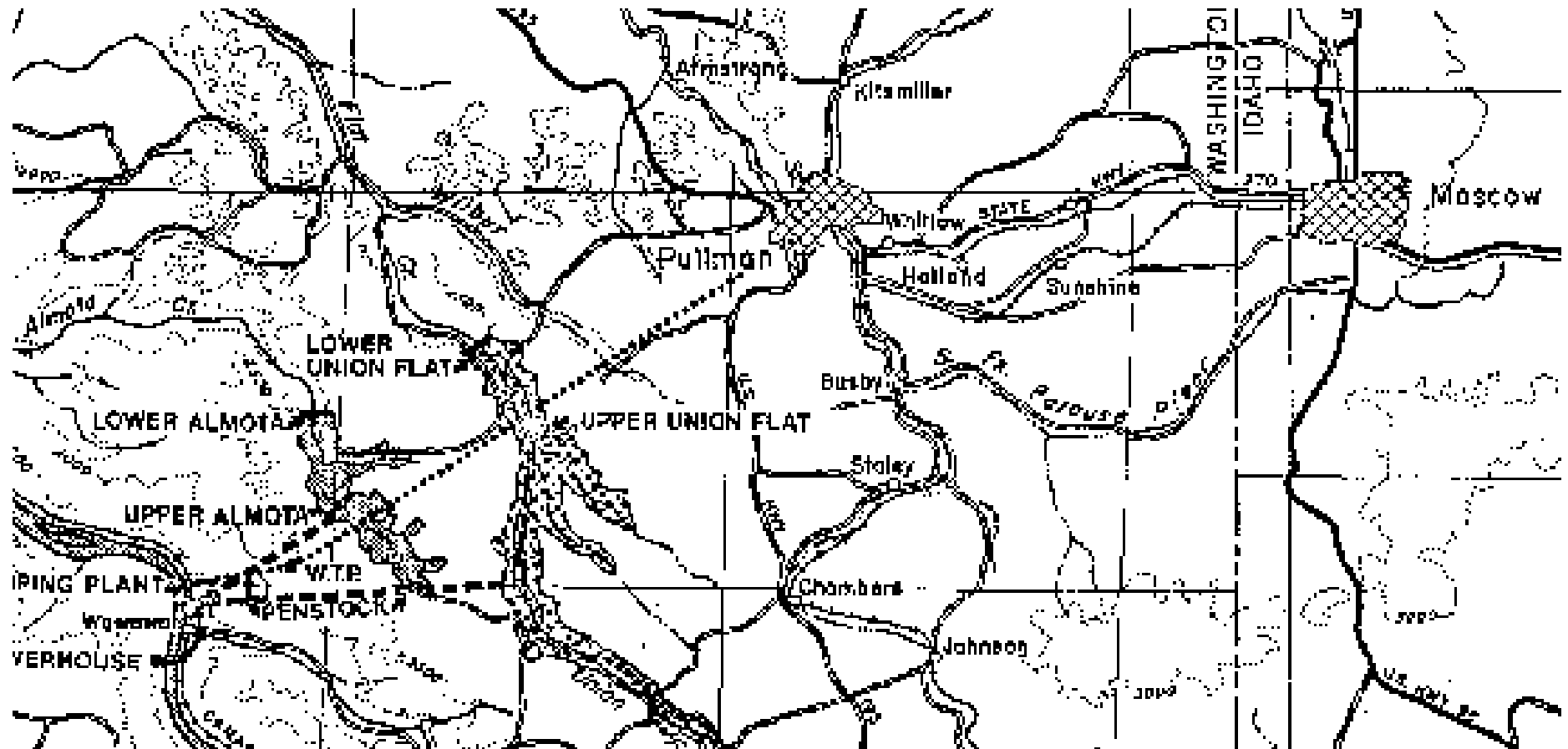
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3/8/76
According to a newspaper clipping provided in January to the Idahoian

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Pumped-Storage Hearing Set Tomorrow

A fiery confrontation appears brewing between farmers in an area southwest of Pullman and the U.S. Army Corps of Engineers when the two meet face-to-face in Pullman tomorrow night at a public meeting on a study of a proposed pumped-storage reservoir in the Union Flat Creek area.

The meeting, scheduled to start at 7:30 p.m. at the Gladish Middle School auditorium, NW 115 State St., is being sponsored by the Moscow-Pullman Water Resources Committee, which may find itself caught in the middle of the battlefield.

The purpose of the meeting will be to determine if the people in the Moscow-Pullman area feel there is a need for a pumped-storage reservoir and to assess local support as well as local opposition to the plan, explained Hoyt, coordinator of the study for the Walla Walla district, Corps of Engineers. The Corps is studying the feasibility

of pumping water from behind Lower Granite Dam on the Snake River to a reservoir at a higher elevation. The water could then be released as needed for hydroelectric power generation, irrigation and municipal and industrial power supply.

The study is expected to last for about three years and its estimated cost is \$290,000, Hoyt said.

Since the study and tomorrow's public hearing were announced, a group of farmers in the area being studied for possible reservoir sites have formed OPAL, Organization for the Preservation of Agricultural Land. OPAL opposes the proposal because of the loss of farmland that would be lost if the reservoir were built, the group's president, Norman Hatley, says.

Not only is it against the construction of the reservoir, Hatley's organization is seeking to stop the study before it starts. He told the

Idahoian the group has enlisted the support of several Granges and the Pullman Sierra Club and plans to be out in force for the public meeting.

The Moscow-Pullman Water Resources Committee is supporting the study of the pumped-storage reservoir because of the possible additional water supply to the cities of Moscow and Pullman, explains that panel's chairman, Calvin Warnick of Moscow.

The committee is also involved with several groundwater studies, sponsoring one by the U.S. Geological Survey on the aquifer of the Moscow-Pullman basin, Warnick said. Other sources of supplementary water must be investigated in the meantime, he said. "We can't wait until the wells run dry to start considering other sources."

The Corps is studying a large area in the Union Flat Creek and Almoa Creek areas southwest of Pullman but

only a small portion of that area would actually be used for the pumped-storage reservoir if one were built, Hoyt explained. A map of the study area being circulated (and accompanying this article) does not represent an area that would be flooded by such a reservoir, he said.

Col. Nelson Conover, district engineer for the Corps, will preside at the meeting and will make a brief introductory presentation, Hoyt said. U.S. Senators and Representatives or their field agents will be allowed to speak first if present, Hoyt said.

Persons wishing to testify will be asked to sign up as they enter the meeting and speakers will be selected at random from the list, he said. There is no time limit for testimony, Hoyt said, but persons with lengthy statements are asked to summarize their remarks orally and then submit written comments for inclusion in the report of the meeting.

Palouse Basin Ground Water Management: Pre-Management Plan

- 1976 - Pumped Storage Proposal

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Idaho Star

Wednesday

Mar. 10, 1976

VOL. 83 NO. 83 MOSCOW, IDAHO 10 Cents

Citizens, Officials Rap Corps, Reservoir Plan

By KENTON BIRD

PULLMAN — Col. Nelson Conover of the U.S. Army Corps of Engineers may have felt a little like General Robert E. Lee at Appomattox. And Moscow Mayor Paul Mann said he didn't realize how appropriate his grey coat would be.

It was, though, because with the exception of some muted defense of the Corps by Mann in his "Confederate" role, the evening belonged to what the mayor called "the Union Army," a delegation of more than 600 opponents of a pumped-storage reservoir proposed for the Union Flat Creek area southwest of Pullman.

A four-hour parade of public officials and private citizens told Conover that not only are they against building such a reservoir, there's no

need to even study the proposal. And several suggested a better study would be to determine if there is still a need for the Corps of Engineers.

Before the barrage of testimony, Conover, the district engineer for the Walla Walla District of the Corps, gave a brief summary of the plans for of the study, expected to be completed in July, 1978, at a cost of nearly \$300,000.

The study's purpose is not to pick a site for construction of a pumped-storage reservoir, Conover emphasized, but rather to determine if such a facility is economically feasible.

In a pumped-storage system, he explained, water is pumped from a lower reservoir, such as the pool behind Lower Granite Dam, to an up-

per reservoir and then released when needed for power generating and other purposes.

A pumped-storage system makes economic sense when the upper and lower reservoirs are close together horizontally but far apart vertically, Conover said. Because of the difference in elevation between the Palouse and the Snake River, the Union Flat Creek area is ideally suited for such a reservoir system, he said.

Preliminary studies showed the area to be a prime candidate for a pumped-storage reservoir because of the possible use of water for irrigation in the Lacrosse area and for a supplemental water supply for Moscow and Pullman, he said.

Because of the widely fluctuating water levels in the upper reservoir, however, there would be little or no use of it for recreation or fish and wildlife, Conover stated. Earlier literature from the Corps listed recreation, fish and wildlife enhancement as possible benefits from such a project.

The study will address the economic benefits and the environmental impact of building such a reservoir, including the possible

flooding of farmland, he said. After the study is completed, it would be up to Congress to authorize the project and appropriate money for it. Actual construction wouldn't start before 1985 and probably not until after 1990, Conover said.

The project must be economically and socially feasible before we would recommend that it be built," he said.

His words fell on deaf ears for most of the crowd, 91 of which expressed a desire to make a statement. By the time 11:30 p.m. rolled around and the last name was called, more than 50 had spoken in opposition; the rest had grown weary and left.

Mayor Mann was the only speaker not to criticize the Corps plan and he drew scattered boos for his defense of the feasibility study as necessary to "provide us with some answers."

Mann said the Moscow City Council didn't feel it knew enough about the plan to take a position prior to the hearing but said the council in the past has been interested in the possible use of a pumped-storage reservoir to provide domestic water supply.

Speaking on his own, however, Mann a professor of electrical engineering at the University of Idaho, said he was convinced there

was going to be a need for additional electrical generating power in the future. "I hope when the alternatives show up you will be willing to come down in favor of something," he said, rather than always being "alternative pleaders."

One of those alternatives may be the type of reservoir tied to the Lower Granite pool, Mann said. "But we won't know unless the Corps is permitted to make the study." That study may turn up a location that would have a minimal impact on farmland, he added.

At the conclusion of Mann's remarks, Moscow businessman Art Heibling strode to the podium, grabbed the microphone from Conover and exclaimed, "There are more of us from Moscow than he."

Mann's comments came amid a steady stream of citizens against the plan, who rapped the loss of fertile farmland, harmful effects on fish and wildlife and the displacement of families in the area and the increased tax burden on Whitman County.

James Henning of St. John, chairman of the Whitman County commissioners, urged the Corps to drop the reservoir study and "use the money and efforts to complete pro-

jects that will help people not displace them."

Norman Hatley of Pullman, president of an anti-reservoir group called OPAL, the Organization for the Preservation of Agricultural Land, drew the biggest cheers for his attacks on the reservoir plan, the study and the Corps in general.

Although several other members of the Hatley family spoke in opposition, Hatley didn't want the crowd to think "this was a Hatley vendetta." There used to be a story in Whitman County, he said, that the squirrels, the Hatleys and the Druffels (another family in the area) would some day take over the county. "That was before the Army Corps of Engineers came along," he quipped.

Hatley called for an immediate halt to the study and suggested instead a feasibility study "on whether it's feasible to have an Army Corps of Engineers."

He said there are only three things the Corps understands: hydroelectric power, political power and people power. "Let's stand up and show the colonel some of that last kind of power," whereby all but 100 of the crowd stood up and applauded.

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• 1976 - Pumped Storage Proposal



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3/16/76 cfdalabon Pump-Storage Study May Be Ended by Corps

The controversial pumped-storage study for the Union Flat area may be abandoned.

An official of the U.S. Army Corps of Engineers has recommended that a study of the feasibility of a pumped-storage reservoir southwest of Pullman be dropped.

Col. Nelson Conover, the Walla Walla District Engineer for the Corps, was meeting with his superior this morning in Portland, Ore., to recommend that the four-week-old Palouse Pumped Storage Study be discontinued and the funds appropriated for it be used to study other pumped-storage reservoir sites in the Pacific Northwest.

Conover, through a spokesman, said he was in favor of dropping the study because of opposition to the plan aired at a public meeting on the study last week in Pullman one week ago.

The study, expected to last 2 1/2 years and estimated to cost nearly \$300,000, was authorized by Congress as part of a \$1.1 million study of the Columbia River and its tributaries. In order for the study to be halted, Congress would have to rescind its authorization.

Conover's recommendation went to Maj. Gen. Wesley Peel of Portland, the North Pacific Division Engineer for the Corps. If Peel concurs, he will ask the House and Senate Public Works Committees to designate the money not yet spent for other projects. Conover's office gave no indication when Peel would rule on the recommendation and Peel couldn't be reached for comment.

Announcement of Conover's decision was made to the Idahoans this morning by the offices of Idaho Sens. Frank Church and James McClure.

Meanwhile, in separate decisions yesterday, the Moscow City Council, the Latah County Commissioners and the Moscow Chamber of Commerce Board of Directors voted their opposition to any pumped-storage reservoir that would flood any agricultural land.

The council's and commissioners' decision came on unanimous votes of those bodies. Barely a quorum was present for the chamber board meeting, with four directors voting against the project and four abstaining.

Although \$225,000 was set aside for the Palouse study, the only expenses so far have been for information brochures, public notices and other materials necessary to get the study under way in Pullman. Conover said that the Corps will not be making any more studies in the area.

were to be built, would involve pumping water from the pool behind Lower Granite Dam and storing it at a higher elevation. The water could be released as necessary to generate electricity and could possibly be used for irrigation and domestic water supply.

Opposition to the reservoir proposal came from all but one of about 60 speakers at the public hearing because depending on where it was built, the reservoir could flood up to 3,000 acres of farmland.

Leading that opposition was Norman Hatley of Pullman, president of a group called Organization for the Preservation of Agricultural Land. He said Conover's decision "restored my faith in the American system. It shows little people still have a voice in government."

Hatley said he was optimistic that the study could be stopped but didn't think action would come this quickly. "We had such a tremendous turnout at the meeting that both Gen. Conover and the Congressmen had to listen to us," he said.

Calvin Warnick of Moscow, chairman of the Moscow-Pullman Water Resources Committee, said he was both surprised and disappointed in Conover's decision. The water resources committee had supported the study because of the potential to provide water to the communities of Moscow and Pullman if such a reservoir were ever built.

"The study (should have) been done and that would have been no guarantee that the reservoir would have ever been built," Warnick said.

A three-month study was needed to learn if this was really a feasible alternative for a surface water supply.

Warnick said he appeared with Conover on a television program in Pullman Friday and that contact at that time gave no indication the study would never be carried to its finish.

"I conceived there is a lot of public opposition and there must have been some political pressure brought to bear. In a political world, that's the way things operate. I guess," said Warnick.

A United States Geological Survey study indicates groundwater in the Moscow-Pullman area isn't dropping as fast as had been previously believed. It will continue to drop, a preliminary report by the United States Geological Survey indicates. The report, which is preliminary, says that the water level in the area is dropping at a rate of about 1 foot per year. The report also says that the water level in the area is dropping at a rate of about 1 foot per year. The report also says that the water level in the area is dropping at a rate of about 1 foot per year.

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Palouse Basin Ground Water Management: Pre-Management Plan

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Organization for Preservation of Agricultural Land

President
Rt. 2, Box 402
Pullman, Wash. 99163



Secretary-Treasurer
Rt. 2, Box 404
Pullman, Wash. 99163

March 24, 1976

Mayor Karen Kieckling, Pullman
Mayor Paul Mann, Moscow
President Glenn Terrell, WSU
President Ernest Hartung, U of I
Latah County Commissioners, Moscow
Whitman County Commissioners, Colfax

Ladies and Gentlemen:

Our organization is greatly concerned about the future policy of your offices in your joint venture in regards to water research.

It is our suggestion, if the Moscow Pullman Water Research Committee is to still function, that authority to secure "study" projects be greatly curtailed.

We feel that all offices concerned should give formal authorization for each project and the public be notified before any study or project is authorized.

To further restrict their authority we would like to suggest you restructure your committee to include two members from both Latah County and Whitman County, and that both Whitman and Latah County Commissioners be made a part of the governing body.

It is our understanding the Water Research Committee meetings are open to the public. If this is the case we would like to be notified of each and every meeting and be sent minutes of these meetings.

We understand the need to have water research, and it is our desire that you have control and the public be kept informed.

We hope you understand our deep concern in this matter.

Respectfully,

Norman Hatley
President, OPAL

cc: C. C. Warnick, Pullman Moscow Water Resource Committee, Chairperson
Ralph Schardhorst, OPAL, Moscow Chairperson
Nora Mae Keifer, OPAL, Pullman Chairperson
Jim Hatley, OPAL, WSU and U of I Chairperson

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MAR 23 1976

WATER RESOURCES
RESEARCH INSTITUTE

Palouse Basin Ground Water Management: Pre-Management Plan

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To further restrict their authority we would like to suggest you restructure your committee to include two members from both Latah County and Whitman County, and that both Whitman and Latah County Commissioners be made a part of the governing body.

It is our understanding the Water Research Committee meetings are open to the public. If this is the case we would like to be notified of each and every meeting and be sent minutes of these meetings.

We understand the need to have water research, and it is our desire that you have control and the public be kept informed.

We hope you understand our deep concern in this matter.

Respectfully,

Norman Hatley
President, OPAL

cc: C. C. Warnick, Pullman Moscow Water Resource Committee, Chairperson
Ralph Scharnhorst, OPAL, Moscow Chairperson
Nora Mae Keifer, OPAL, Pullman Chairperson
Jim Hatley, OPAL, WSU and U of I Chairperson

RECEIVED

MAR 23 1976

WATER RESOURCES
RESEARCH INSTITUTE

Palouse Basin Ground Water Management: Pre-Management Plan

- 1976 - Pumped Storage Proposal

PMWRC Members:

Due to recent "controversy" and a letter dated 3/24/76 from OPAL, I suggest we better decide soon what the future of our Committee is to be. I further suggest that we assess what our Administrators' views are. If any agree in principle with the OPAL letter, I'm for abandoning further work. If a study Committee can't stick, to [redacted] with it all.

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Palouse Basin Ground Water Management: Pre-Management Plan

•1979

Barker Study (USGS)

Despite several water-resource studies in the area during the past 15 years, local concern over the possibility of ground-water depletion has remained largely unsettled. Because water levels have continued to decline, and because virtually all human activity in the area is dependent to some extent on the ground-water resource, questions raised by the local populace such as "How long will the water last?" (Jones and Ross, 1969), are certainly not without reason.

Future demands for water may be difficult to satisfy, especially without the support of artificial recharge to the ground-water reservoir or surface-water importation (Foxworthy and Washburn, 1963; Stevens, 1960). However, finding excess water that is chemically suitable for artificial recharge is a major problem, and the importation of water involves complexities in conveyance design and high costs. It has become critically important, then, to understand the local ground-water system, to properly assess its limitations as a future source of water, and to judiciously manage the available water resources.

Palouse Basin Ground Water Management: Pre-Management Plan

•1979

Barker Study (USGS)

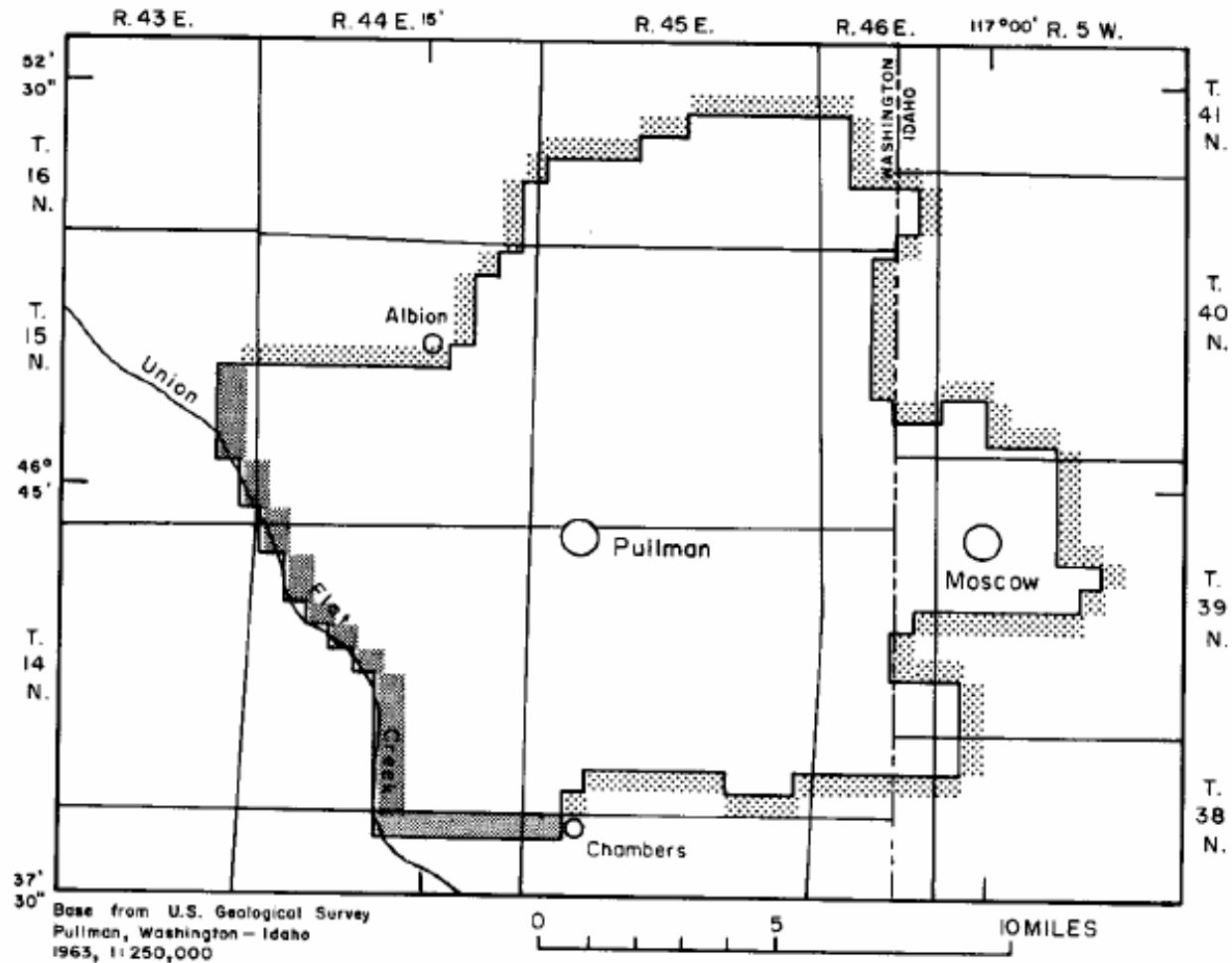
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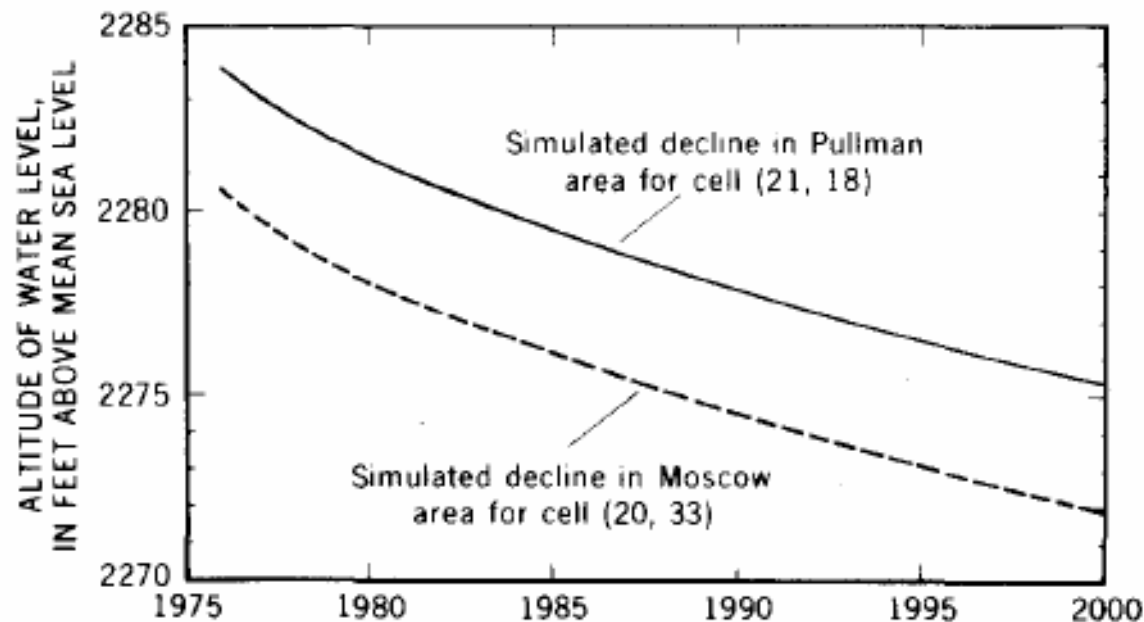


Palouse Basin Ground Water Management: Pre-Management Plan

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When the simulated pumping rate is held at a constant 6,600 acre-ft/yr, water levels in the primary aquifer system continue to decline through 1999. However, the total decline by 2000 is less than 10 feet below 1975 levels and the rate of decline decreases to about 0.2 ft/yr, as seen in figure 36. The resulting water-budget items are shown in table 3.

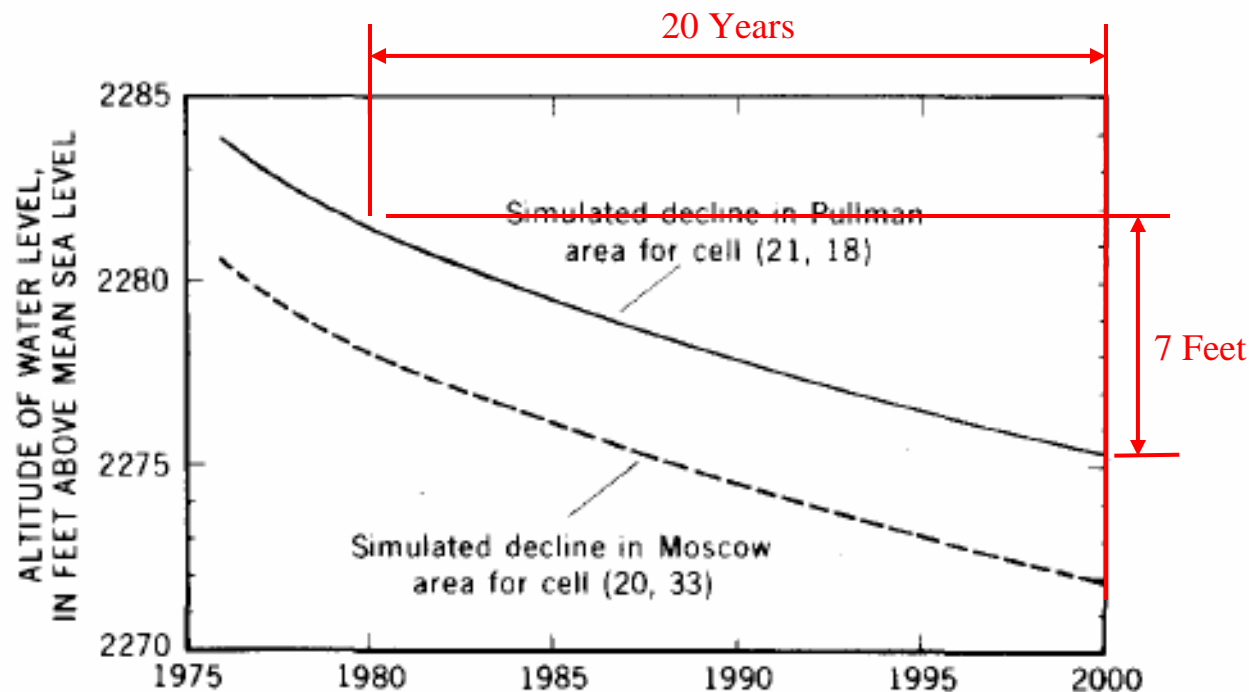


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Palouse Basin Ground Water Management: Pre-Management Plan

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Results of model analysis, in which different conditions of pumping were projected to 2000, indicate that water-level declines will continue if the present-day pumping rates are maintained or increased. A maximum additional decline of about 55 feet is indicated if pumping rates were nearly tripled during 1976-99. However, because of the strong correlation between the pumping stress and water-level decline, simulation indicates that the rate of decline would be reduced to less than 0.2 ft per year if pumping rates were to stabilize near the present-day average of 6,600 acre-ft/yr.

Palouse Basin Ground Water Management: Pre-Management Plan

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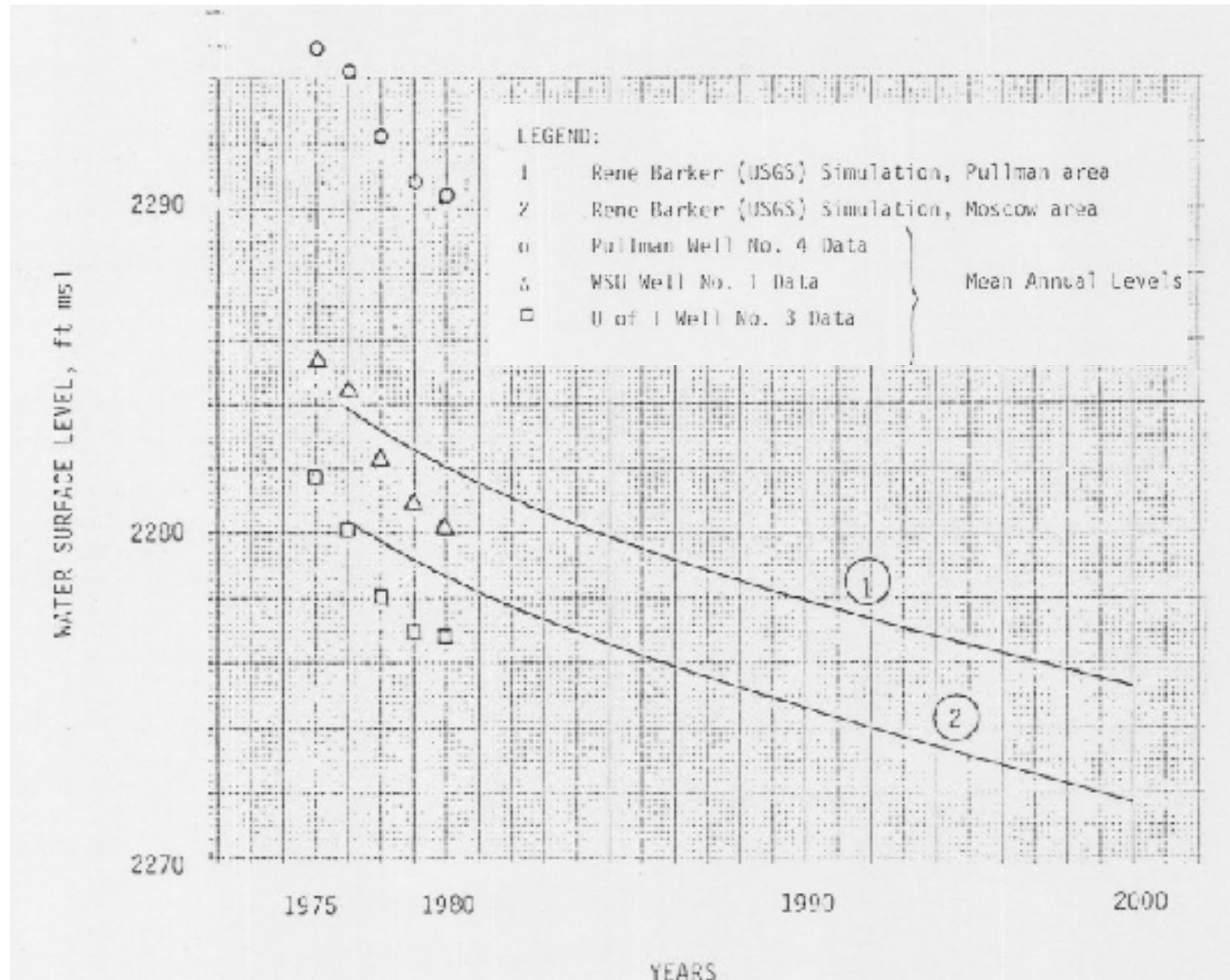
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2005 Pumping \approx 7500 acre-ft

Palouse Basin Ground Water Management: Pre-Management Plan

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Crosby (WSU) oral report projections vs. actual



Palouse Basin Ground Water Management: Pre-Management Plan

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Declining water supply called no cause for worry

By Diana Smith

The underground water supplies for Moscow and Pullman are declining slightly faster than a U.S. Geological Survey study a few years back predicted, but area officials say there's no cause for worry.

The USGS report, based on a computer simulation, predicted water supply problems for this area by about the year 2010. However, says Washington State University geological engineer James Crosby, those predictions were based on a doubling or tripling of pumpage rates from area wells.

Crosby presented his data at a meeting of an area water resources committee in Pullman Wednesday afternoon and spoke with this newspaper today. The committee is comprised of representatives from Moscow, Pullman, the

University of Idaho and WSU.

The pumpage rates from wells that supply most of the area's water have not risen as the USGS survey predicted they would, Crosby said. Instead, they have remained about the same.

Another report presented to the water resources committee by the Whitman County Regional Planning Council indicates that population, a factor in pumping rates, is not expected to surge upward dramatically in this area in the next few years. Studies by planners in Moscow, Pullman, and Whitman and Latah Counties indicate that the population should increase between 1980 and 2000 at about the same 1.5 percent per year as between 1970 and 1980.

"I think we're far from being in trouble," Crosby said. "It's just something we have to watch. It doesn't look like a particularly critical situation right now."

The water resources committee will meet one more time — in Moscow in April — and will then temporarily disband, said Moscow City Engineer Gary Presol. Each agency involved will continue to send pumpage and water level reports from its wells to Crosby who will compile a yearly report on the area water situation. Crosby said the first of those reports will be completed about a year from now, in April or May of 1983.

Between now and the next meeting, Presol said, the committee will compile a bibliography of all the water studies that have been done concerning this area. That will provide a resource for future studies to draw on, he said.

Presol said the committee will probably continue to meet on a yearly basis or could be re-activated if the water situation changes drastically.

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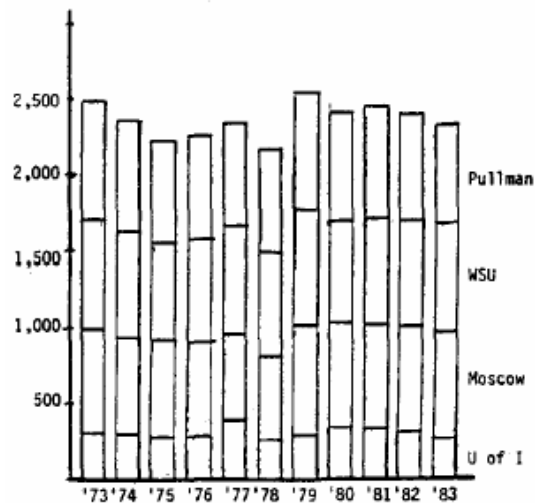
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Palouse Basin Ground Water Management: Pre-Management Plan

- 1984

Crosby death prompts reconvening of PMWRC



cow-Pullman Community Water Usage
Pumped from Ground Water

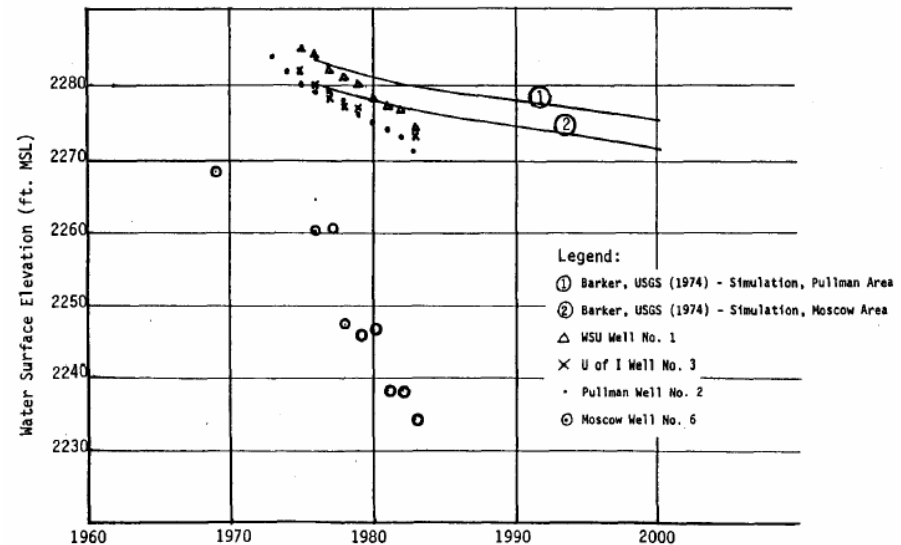


Figure 5. Comparison of Actual and Projected Decline of
Water Levels in Wells of Moscow-Pullman Basin.

- Recommend careful monitoring be continued
- Recommend update to Barker model (see Lum et al, 1990)

Palouse Basin Ground Water Management: Pre-Management Plan

•1987

IDWR concerned about possible “mining”

Idaho Statutes

TITLE 42 IRRIGATION AND DRAINAGE -- WATER RIGHTS AND RECLAMATION CHAPTER 2
APPROPRIATION OF WATER -- PERMITS, CERTIFICATES, AND LICENSES -- SURVEY 42-
237a. POWERS OF THE DIRECTOR OF THE DEPARTMENT OF WATER RESOURCES.

g. . . .Water in a well shall not be deemed available to fill a water right therein if withdrawal therefrom of the amount called for by such right would affect, contrary to the declared policy of this act, the present or future use of any prior surface or ground water right or result in the withdrawing of the ground water supply at a rate beyond the reasonably anticipated average rate of future natural recharge. . .

However, the director may allow withdrawal at a rate exceeding the reasonably anticipated rate of future natural recharge if the director finds it is in the public interest and if it satisfies the following criteria:

1. A program exists or likely will exist which will increase recharge or decrease withdrawals within a time period acceptable to the director to bring withdrawals into balance with recharge.

Palouse Basin Ground Water Management: Pre-Management Plan

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Palouse Basin Ground Water Management: Pre-Management Plan

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CECIL D. ANDRUS
Governor
A. KENNETH DUNN
Director

State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 450 W. State Street, Boise, Idaho

Mailing address:
Storehouse
Boise, Idaho 83720
(208) 334-4440

May 15, 1987

Andrea Beatty Riniker, Director
Department of Ecology
Olympia, WA 98504

Dear Ms. Riniker:

This is to advise you of the reason Idaho has protested Application No. G3-29278 filed by Washington State University for permit to appropriate 2500 gpm for continuous municipal supply.

The Notice of Application appears to propose an additional water use. However, in the February 17, 1987, memorandum from Mr. Dillingham of Washington State University to Mr. Earl Moore it is stated:

the proposed 2500 gpm well (well No. 7) is intended to replace three other wells as they become inoperable, and the well will not "go online" until it is required as a direct substitute for WSU wells that have either gone dry or become inoperable. The memorandum further states that WSU water consumption will not increase regardless of the availability of well No. 7. and Well No. 7, discounting a major failure in other WSU wells, may not be activated for 20 years.

The recently completed hydrogeology and mathematical model of the ground water flow in the Pullman/Moscow region, Washington and Idaho, prepared by Mr. Smoot in cooperation with the U.S. Geological Survey and the University of Idaho demonstrates the critical nature of the water resource balance in the basin. The model predicts that should withdrawals increase even at a rate as low as one percent per year the aquifer will not reach a recharge/discharge equilibrium and water level declines will continue. The Pullman/Moscow water supply problem has been subjected to numerous studies over the years and clearly it

Palouse Basin Ground Water Management: Pre-Management Plan

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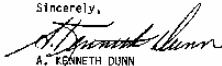
•1987

IDWR concerned about possible “mining”

State of Washington 2 May 15, 1987

is in the interest of both the state of Washington and Idaho to seek a solution to the problem.

I propose that the Washington State Department of Ecology and the Idaho Department of Water Resources meet to see if we can develop an action program to address this problem. A memorandum of understanding between the two agencies could be developed which would clearly identify the conditions under which additional water use development would be allowed, outline conservation programs which would be enforced, and support the development of a long term management plan for the region. I would be most happy to meet with you and members of your staff to discuss this in more detail at your convenience.

Sincerely,

A. KENNETH DUNN
Director

AKD:alw
cc: Water Board Members
Governor's Office
Clearwater RC&D
U.S.G.S
City of Moscow
City of Pullman
University of Idaho
Washington State University

•1987

PMWRC reactivated

Palouse Basin Ground Water Management: Pre-Management Plan

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- 1987

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Palouse Basin Ground Water Management: Pre-Management Plan

- 1988

Membership extended to Latah and Whitman Counties

- 1989

Corps of Engineers Reconnaissance Report

	NORTH PALOUSE	LATRO RESERVOIR			ROBINSON LAKE	PARADISE CREEK	SNAKE RIVER	DWORSHAK	PULLMAN CHANNEL
	WATER SUPPLY	50,000	60,000	70,000	4,000	RESERVOIR			6075 CFS
	LINE	ACRE-FEET	ACRE-FEET	ACRE-FEET	ACRE-FEET	1,500 ACRE-FEET			CAPACITY
AVERAGE ANNUAL DAMAGE REDUCTION BENEFIT		\$75.0	\$75.0	\$75.0	\$131.2	\$156.1			\$41.4 *
MUNICIPAL & INDUSTRIAL WATER SUPPLY		\$8,946.0	\$8,946.0	\$8,946.0					
AVERAGE ANNUAL HYDROPOWER BENEFIT		\$233.0	\$245.0	\$261.0					
TOTAL AVERAGE ANNUAL BENEFIT		\$9,254.0	\$9,266.0	\$9,282.0	\$131.2	\$156.1			\$41.4
PROJECT COST (\$1000)									
LANDS, EASEMENTS, RIGHTS-OF-WAY	\$270.0	\$1,225.0	\$1,225.0	\$1,225.0	\$1,419.0	\$1,188.0	\$247.0	\$500.0	\$120.0
CONSTRUCTION COST	\$24,381.0	\$20,895.0	\$24,095.0	\$28,695.0	\$6,452.0	\$6,757.0	\$27,180.0	\$44,106.0	\$701.0
CONTINGENCIES	\$6,095.0	\$3,000.0	\$3,000.0	\$3,179.0	\$1,504.0	\$1,449.0	\$6,773.0	\$10,994.0	\$165.0
SUBTOTAL	\$30,746.0	\$25,120.0	\$28,320.0	\$33,099.0	\$9,375.0	\$9,394.0	\$34,200.0	\$55,600.0	\$986.0
E & D	\$3,000.0	\$3,280.0	\$3,280.0	\$3,280.0	\$903.0	\$892.0	\$3,300.0	\$5,100.0	\$159.0
S & A	\$2,300.0	\$2,600.0	\$2,600.0	\$2,623.0	\$722.0	\$714.0	\$2,500.0	\$4,300.0	\$66.0
INTEREST DURING CONSTRUCTION	\$6,900.0	\$5,913.0	\$6,523.0	\$7,439.0	\$1,527.0	\$1,527.0	\$7,600.0	\$12,400.0	\$106.0
INVESTMENT COST	\$42,946.0	\$36,913.0	\$40,723.0	\$46,441.0	\$12,527.0	\$12,527.0	\$47,600.0	\$77,400.0	\$1,317.0
AVERAGE ANNUAL COST									
INTEREST & AMORT. (8 7/8 %, 100Y .088768)	\$3,812.2	\$3,276.7	\$3,614.9	\$4,122.5	\$1,112.0	\$1,112.0	\$4,225.4	\$5,870.6	\$116.9
OPERATION & MAINTENANCE	\$2,987.0	\$160.0	\$160.0	\$160.0	\$47.0	\$32.0	\$4,721.0	\$5,562.0	\$5.8
TOTAL ANNUAL COST	\$6,799.2	\$3,436.7	\$3,774.9	\$4,282.5	\$1,159.0	\$1,144.0	\$8,946.4	\$12,432.6	\$122.8
TOTAL ANNUAL COST INCLUDING NORTH PALOUSE WATER SUPPLY LINE		\$10,235.9	\$10,574.1	\$11,081.7					

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OPERATION & MAINTENANCE	\$2,987.0	\$160.0	\$160.0	\$160.0	\$47.0	\$32.0	\$4,721.0	\$5,562.0	\$5.8
TOTAL ANNUAL COST	\$6,799.2	\$3,436.7	\$3,774.9	\$4,282.5	\$1,159.0	\$1,144.0	\$8,946.4	\$12,432.6	\$122.8
TOTAL ANNUAL COST INCLUDING NORTH PALOUSE WATER SUPPLY LINE		\$10,235.9	\$10,574.1	\$11,081.7					

(Snake River) \$47,600,000 in 1989 ⇒ \$77,350,000 in 2006

Palouse Basin Ground Water Management: Pre-Management Plan

- 1988

Membership extended to Latah and Whitman Counties

- 1989

Corps of Engineers Reconnaissance Report

	NORTH PALOUSE	LATRO RESERVOIR			ROBINSON LAKE	PARADISE CREEK	SNAKE RIVER	DWORSHAK	PULLMAN CHANNEL
	WATER SUPPLY	50,000	60,000	70,000	4,000	RESERVOIR			6075 CFS
	LINE	ACRE-FEET	ACRE-FEET	ACRE-FEET	ACRE-FEET	1,500 ACRE-FEET			CAPACITY
AVERAGE ANNUAL DAMAGE REDUCTION BENEFIT		\$75.0	\$75.0	\$75.0	\$131.2	\$156.1			\$41.4 *
MUNICIPAL & INDUSTRIAL WATER SUPPLY		\$8,946.0	\$8,946.0	\$8,946.0					
AVERAGE ANNUAL HYDROPOWER BENEFIT		\$233.0	\$245.0	\$261.0					
TOTAL AVERAGE ANNUAL BENEFIT		\$9,254.0	\$9,266.0	\$9,282.0	\$131.2	\$156.1			\$41.4
PROJECT COST (\$1000)									
LANDS, EASEMENTS, RIGHTS-OF-WAY	\$270.0	\$1,225.0	\$1,225.0	\$1,225.0	\$1,419.0	\$1,188.0	\$247.0	\$500.0	\$120.0
CONSTRUCTION COST	\$24,381.0	\$20,895.0	\$24,095.0	\$28,695.0	\$6,452.0	\$6,757.0	\$27,180.0	\$44,106.0	\$701.0
CONTINGENCIES	\$6,095.0	\$3,000.0	\$3,000.0	\$3,179.0	\$1,504.0	\$1,449.0	\$6,773.0	\$10,994.0	\$165.0
SUBTOTAL	\$30,746.0	\$25,120.0	\$28,320.0	\$33,099.0	\$9,375.0	\$9,394.0	\$34,200.0	\$55,600.0	\$986.0
E & D	\$3,000.0	\$3,280.0	\$3,280.0	\$3,280.0	\$903.0	\$892.0	\$3,300.0	\$5,100.0	\$159.0
S & A	\$2,300.0	\$2,600.0	\$2,600.0	\$2,623.0	\$722.0	\$714.0	\$2,500.0	\$4,300.0	\$66.0
INTEREST DURING CONSTRUCTION	\$6,900.0	\$5,913.0	\$6,523.0	\$7,439.0	\$1,527.0	\$1,527.0	\$7,600.0	\$12,400.0	\$106.0
INVESTMENT COST	\$42,946.0	\$36,913.0	\$40,723.0	\$46,441.0	\$12,527.0	\$12,527.0	\$47,600.0	\$77,400.0	\$1,317.0
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Palouse Basin Ground Water Management: Pre-Management Plan

- 1988

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	WATER SUPPLY	50,000	60,000	70,000	4,000	RESERVOIR			6075 CFS
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(Laird – const) \$79,860,000 in 1989 ⇒ \$81/mo/connection in 2006

Palouse Basin Ground Water Management: Pre-Management Plan

1989

Resolution of Understanding (PMWRC, IDWR, WDE)

NOW, THEREFORE BE IT RESOLVED that the parties to this Resolution do agree to the following:

The Idaho Department of Water Resources (IDWR) and Washington Department of Ecology (WDE) agree to commit sufficient staff time to assist in the completion of such tasks as may be appropriate. IDWR and WDE further agree to pursue the implementation of a coordinated Washington-Idaho ground water management plan for the Pullman-Moscow basin in accordance with their respective state law policies.

The Pullman-Moscow Water Resources Committee (PMWRC) agrees to work with the state agencies and to serve as the forum for input from local governments, interest groups and private citizens.

Specific obligations of the Committee are as follows:

Palouse Basin Ground Water Management: Pre-Management Plan

1989

Resolution of Understanding (PMWRC, IDWR, WDE)

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Palouse Basin Ground Water Management: Pre-Management Plan

•1989

Resolution of Understanding (PMWRC, IDWR, WDE)

Specific obligations of the Committee are as follows:

1. PMWRC will pursue and administer funding to conduct and promote studies and research relative to improving knowledge of the water resources of the basin.
2. PMWRC will prepare a management plan for the basin in cooperation with the two state agency parties (IDWR and WDE), which will address both water quantity and water quality concerns.
3. PMWRC will prepare as an initial step in the development of the management plan a principal work plan and time schedule which will outline the concerns and issues to be studied. This work plan shall indicate the party or parties with responsibilities for each task and an estimated schedule for completion of each task.
4. PMWRC will encourage public involvement in the development of the water management plan through public hearings and education programs.
5. PMWRC will facilitate the implementation of the ground water management plan in concert with the member entities of the Committee.

Palouse Basin Ground Water Management: Pre-Management Plan

•1989

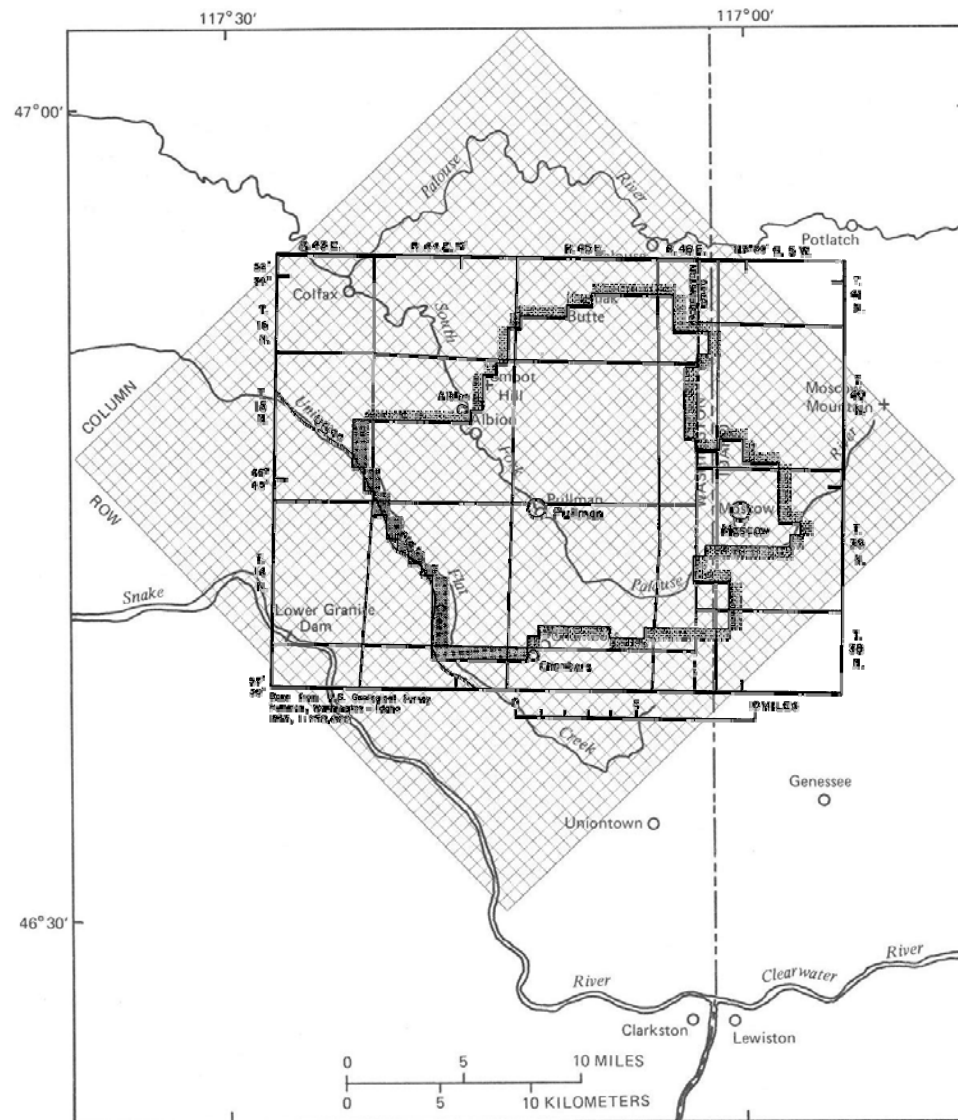
Resolution of Understanding (PMWRC, IDWR, WDE)

Specific obligations of the Committee are as follows:

1. PMWRC will . . . promote studies and research . . .
2. PMWRC will prepare a management plan . . .
3. PMWRC will prepare as an initial step in the development of the management plan a principal work plan and time schedule which will outline the concerns and issues to be studied. This work plan shall indicate the party or parties with responsibilities for each task and an estimated schedule for completion of each task.
4. PMWRC will encourage public involvement . . .
5. PMWRC will facilitate the implementation . . . in concert with the member entities . . .

Palouse Basin Ground Water Management: Pre-Management Plan

- 1990 Lum, Smoot & Ralston Model



Palouse Basin Ground Water Management: Pre-Management Plan

- 1990 Lum, Smoot & Ralston Model - Assumptions

The Snake River appears to be a ground-water-discharge area for the Moscow-Pullman area. Water levels in shallow wells in the Grande Ronde Basalt

. . .

flow paths between the basalt flows is horizontal; for these reasons, a significant part of the discharge from the basin may be through the sides of the canyon and may represent discharge from the regional ground-water-flow system.

Basin	Recharge, in inches per year	
	Predevelopment land use	Current farming practice
South Fork Palouse River	4.13	2.79
Union Flat Creek	2.98	3.65

Palouse Basin Ground Water Management: Pre-Management Plan

- 1990 Lum, Smoot & Ralston Model - Assumptions

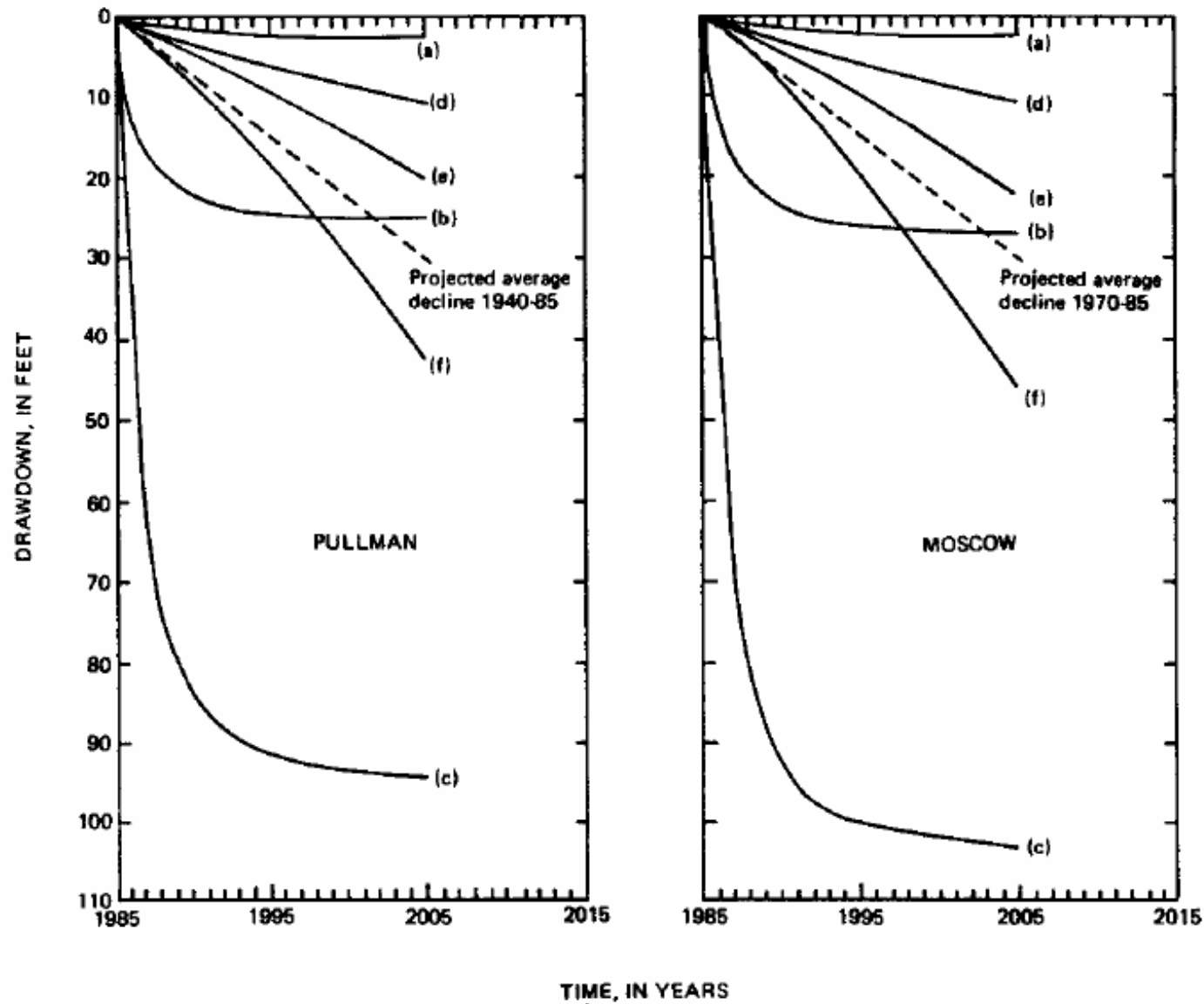
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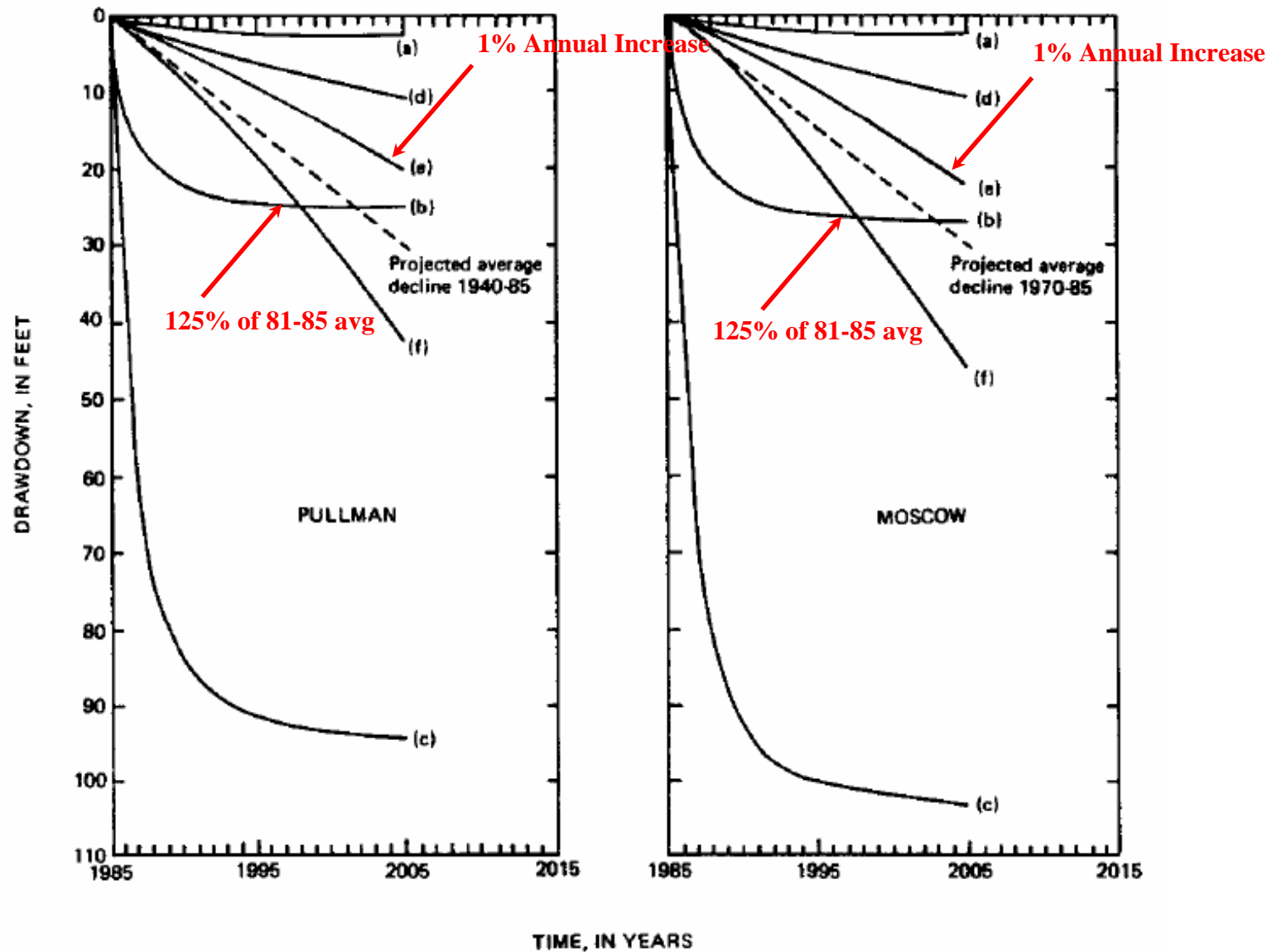
Palouse Basin Ground Water Management: Pre-Management Plan

- 1990 Lum, Smoot & Ralston Model - Results



Palouse Basin Ground Water Management: Pre-Management Plan

- 1990 Lum, Smoot & Ralston Model - Results

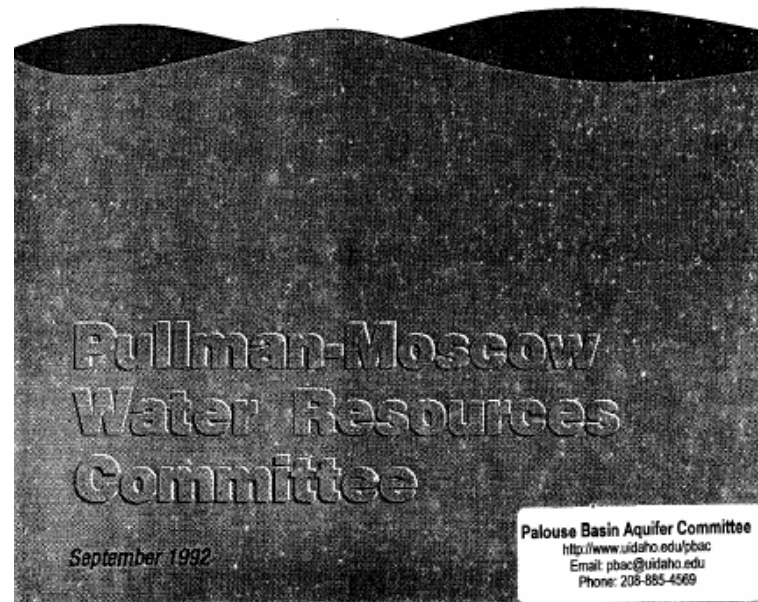


Palouse Basin Ground Water Management: The Management Plan

- 1992

Ground Water Management Plan

Ground Water Management Plan



Palouse Basin Ground Water Management: The Management Plan

- 1992

Ground Water Management Plan

6.2 Role of the Committee

The role of the COMMITTEE is to encourage ENTITIES to implement the PLAN. The COMMITTEE will also monitor the success of the ENTITIES in carrying out their action plans and achieving the goals of the PLAN. Each ENTITY will be expected to adopt an action plan, interfacing with the stated goals of the PLAN. The COMMITTEE will provide guidance related to water-use plans, conservation strategies relative to water use, implementation policies, and the preparation of local ordinances or zoning regulations.

6.2.1 Education and Information Exchange

One of the key functions of the COMMITTEE will be to provide a forum for the exchange of successful and effective management policies, strategies, and techniques among the ENTITIES and other interested groups and governing bodies. Public involvement and education in BASIN water management issues are extremely important. The success of public education and the level of participation in conservation and other water resource issues will be assessed annually. It will be incumbent upon the members of the COMMITTEE to keep abreast of effective water resource management practices and articulate these concepts to the ENTITIES and their constituents. Action plans will be revised as new techniques for managing the ground water and better understanding of the basin ground water system become available.

6.2.2 Data Base

It shall be the responsibility of the COMMITTEE to continue to gather, maintain, and evaluate a data base of well locations, water consumption, and water levels for the BASIN. The COMMITTEE will

6.2.3 Research

Many research projects have been completed over the past decade in the hopes of better understanding the BASIN configuration. From this research has evolved a conceptual view of the aquifers system with the acceptance of the USGS MODEL. To further refine the MODEL, the COMMITTEE will continue to acquire, maintain, and upgrade information as it relates to the ground water system.

This research will need to continue to be a cooperative effort with state, federal, local, and private sources. Over the course of the next several years, the COMMITTEE will establish research priorities essential to furthering the understanding of the BASIN.

Palouse Basin Ground Water Management: The Management Plan

- 1992

Ground Water Management Plan

6.2 Role of the Committee

The role of the COMMITTEE is to encourage entities to implement the PLAN

6.2.1 Education and Information Exchange

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To further refine the MODEL, the COMMITTEE will continue to acquire, maintain, and upgrade information as it relates to the ground water system.

Palouse Basin Ground Water Management: The Management Plan

- 1992

Ground Water Management Plan

The following goals and their expanded definitions form the foundation of the PLAN.

- To provide for future beneficial use of the basin ground water without depleting the basin aquifers while protecting the quality of the water.
- To promote a program of public education and awareness regarding basin ground water management issues.
- To promote careful monitoring and analysis of the ground water level and usage data for the basin.
- To continue to explore possible supplemental water sources for anticipated and potential future water use in the basin.
- To review and make recommendations on all water use or land use applications whose anticipated impact on the ground water system potentially lies outside the stated goals of the plan or policies adopted by the member entities.
- To review and make recommendations relative to the development of an agreement for water transfers across the state line.

Palouse Basin Ground Water Management: The Management Plan

- 1992

Ground Water Management Plan

- TO PROVIDE FOR FUTURE BENEFICIAL USE OF THE BASIN GROUND WATER WITHOUT DEPLETING THE BASIN AQUIFERS WHILE PROTECTING THE QUALITY OF THE WATER.

The primary goal is to insure that a stable ground water level is maintained in the BASIN aquifers. The COMMITTEE adopts the standard that the two universities and the two cities shall attempt to limit their annual aquifer pumping increases to one percent (1.0%) of their pumping volume based on a five (5) year moving average starting with 1986. At no time shall the accumulated total pumping exceed 125% of the 1981-1985 average for the two universities and the two cities. These initial limits on pumping rates are based upon historical data and water levels predicted by the MODEL. An estimate of the dispersed county pumping will be made based on an average per capita use for all county residences within the BASIN boundaries. Latah and Whitman counties will attempt to limit pumping increases from the BASIN aquifers to 125% of the estimated 1990 pumping levels. Further refinement of the MODEL will be necessary to establish acceptable limits on long term pumping rates which will confirm a stable water level for future users. The COMMITTEE will update the MODEL periodically and

Palouse Basin Ground Water Management: The Management Plan

- 1992

Ground Water Management Plan

- TO PROVIDE FOR FUTURE BENEFICIAL USE OF THE BASIN GROUND WATER WITHOUT DEPLETING THE BASIN AQUIFERS WHILE PROTECTING THE QUALITY OF THE WATER.

. . . The two universities and the two cities shall attempt to limit their annual aquifer pumping increases to one 1% of their pumping volume based on a five year moving average starting with 1986.

At no time shall the accumulated total pumping exceed 125% of the 1981-1985 average . . .

Latah and Whitman counties will attempt to limit pumping increases from BASIN aquifers to 125% of the estimated 1990 pumping levels.

The COMMITTEE will update the MODEL periodically and acceptable pumping levels may be modified upward or downward upon agreement by the entities.

Palouse Basin Ground Water Management: The Management Plan

- 1992

Interagency Agreement (WDOE, IDWR)

NOW, THEREFORE, IT IS HEREBY AGREED THAT administration of the ground water resources of the Pullman-Moscow aquifer will be in accordance with the adopted "Groundwater Management Plan" of the PMWRC to the extent that such plan can be implemented and administered under the laws of each state. The following specific actions will be taken by the administrative agency of each state to implement the plan:

1. Issuance of new permits to appropriate ground water and approval of applications to change existing ground water rights will be guided by the withdrawal limitations in the PMWRC plan. The state administrative agencies will provide copies of all such applications to the PMWRC for review and evaluation relative to compliance with the PMWRC plan. The decision-making authority rests with the state agency, but the recommendations of the PMWRC will be made part of the official record for each application.
2. Applicants proposing significant (as determined by the director of the state within which the application is filed) increases in withdrawal of ground water from the Pullman-Moscow aquifer will be required to provide information on alternative sources of water, conservation practices to be implemented to reduce the quantity of water withdrawn, and similar information needed to demonstrate compliance with the PMWRC plan.
3. Applications for transfer of ground water rights across the state line will be considered in accordance with the applicable laws of each state and will be guided by the PMWRC plan.
4. The administrative agency of each state will, within the funding available and the priorities set by the director of each state, endeavor to enforce the applicable laws of each state relative to supervision of construction and maintenance of wells, unauthorized diversion and use of water, and conservation of water to achieve the goals of the PMWRC plan.
5. Within funding specifically available for such purposes, the administrative agency of each state will cooperate in studies necessary to evaluate the ground water resource and improve management of it.
6. A representative of each agency will be designated by the director of each agency as responsible for coordination of the agency's activities with the PMWRC.

Palouse Basin Ground Water Management: The Management Plan

- 1992

Interagency Agreement (WDOE, IDWR)

IT IS HEREBY AGREED that administration of the ground water resources . . .
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5. Within funding specifically available for such purposes, the administrative agency of each state will cooperate in studies necessary to evaluate the ground water resource and improve management of it.

6. A representative of each agency will be designated by the director of each agency as responsible for coordination of the agency's activities with the PMWRC.

Palouse Basin Ground Water Management: Post-Management Plan

- 1993
Tiered Rates / Land Use Discussions; Sole Source Aquifer (SSA) Petition
- 1994
Project/Development Evaluation Role; Conservation Plan
- 1995
Water Summit; Incremental Pricing Study Discussed
- 1996
Conservation Coordinator; Dam discussion; SSA Decision
- 1997
WSU Golf Course; Get Wise / Conservation
- 1998
Watershed Management Act; Name Changed to PBAC
- 1999
OK Project; Growth discussions
- 2000
20 Year GR Stabilization Goal; Conservation Coordinator
- 2002
WRIA 34 Planning Unit; Naylor Application
- 2003
Petition for CGMA/GWMA
- 2005
Naylor; CAG; Interim Committee; Water Summit
- 2006
Naylor, Hawkins, WSU, Water Summit

Thank You!