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INITIAL WATERSHED ASSESSMENT

WATER RESOURCES INVENTORY AREA 55

LITTLE SPOKANE RIVER WATERSHED

Open-File Technical Report 95-15

Prepared by

Dames & Moore, Inc.

and

Cosmopolitan Engineering Group

in Cooperation with

Washington State Department of Ecology

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF MAPS

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

Washington Department of Ecology's (Ecology) Shorelands and Water Resources Program is charged with managing the state's water resources to ensure that the waters of the state are protected and used for the greatest benefit. An important component of water management relies on permitting and enforcement of water rights. The State's authority on these issues, and that of Ecology, is outlined in Chapters 90.03 and 90.44 of the Revised Code of Washington (RCW). In order to make water management decisions, particularly when considering whether to grant a permit for water use, Ecology must determine that the proposed water use passes the following four statutory tests (Chapter 90.03.290 RCW):

- The use will be beneficial;
- The use will be in the public interest;
- The water is available;
- The use will not impair senior water users.

In addition to these statutory tests, when Ecology makes a water use decision it must also consider other water management issues and concerns mandated by State and Federal Laws including non-degradation of water quality (Washington Administrative Code (WAC) 173-200 and 201A), preservation of instream flows to maintain aquatic habitat and other beneficial uses especially where specified by statute (WAC 173-500), and preservation of aquatic habitat for endangered fish stocks and other species.

The goal of this report is to document the status of surface and ground water resources in the Little Spokane River watershed in Washington State (Water Resources Inventory Area Number 55 (WRIA 55)), and to evaluate the information that is available for addressing regulatory concerns and for making appropriate water resource management decisions. To meet this goal, key water management issues in the WRIA which impact surface water and ground water appropriation decisions are identified and documented. For this initial survey, information on hydrologic conditions within the watershed as a whole was compiled to broadly indicate the "health" of the resource. These hydrologic conditions include water quantity, hydrogeology, water demand, water quality, and status of aquatic habitat and fish stocks.

Assessment of these conditions are based on readily available information about water rights and claims, streamflow, precipitation, hydrogeology and ground water levels, fish stocks and water quality. Watershed data and information was obtained from the geographic information system (GIS) which was supplied by Ecology, review of Ecology periodic stream flow databases, a limited review of literature for the geographic area, NOAA climatologic data bases, U.S. Geological Survey streamflow data (obtained from Hydrosphere Inc. CD-ROM compilation), the Storet water quality data base for the state (obtained from EarthInfo Inc. CD-ROM compilation), and a limited survey of tribes and local, state and federal agencies serving the watershed.

WATERSHED DESCRIPTION

GEOGRAPHY AND HYDROGRAPHY

The Spokane River watershed (WRIA 55) encompasses approximately 700 square miles along the eastern border of Washington. The area includes the northern one-third of Spokane County, the southern portion of Pend Oreille County, and a minor portion of eastern Stevens County (Map 1). The terrain in the WRIA includes hilly to mountainous terrain in the eastern and northern portions, and the broad relatively level Little Spokane River valley in the central portion. Elevations range from less than 1,700 feet above mean sea level where the Little Spokane River joins the Spokane River northwest of Spokane, to nearly 6,000 feet above mean sea level on top of Mt. Spokane along the east border of the WRIA.

All of the watershed drains directly into the Little Spokane River, which flows into the Spokane River (approximately 5 miles north of Spokane city limits). Major lakes in the WRIA include Eloika Lake, Diamond Lake, Sacheen Lake and Horseshoe Lake, all located in the northern portion of the watershed. The largest stream tributary to the Little Spokane River is Dragoon Creek, which drains a basin of approximately 177 square miles (Chung 1975). Other major streams in the WRIA include Deadman Creek, which drains a basin of approximately 165 square miles, Little Deep Creek, Deer Creek and the West Branch of the Little Spokane River.

The lower eight mile reach of the Little Spokane River was designated a State Scenic River corridor in 1991 by the State Legislature. A river management plan is being developed to preserve the unique qualities of this portion of the river which includes a diverse and biologically rich riparian wetland zone (EWU 1991).

LAND COVER AND LAND USE

This section is a summary of existing land use information available from several sources, including Spokane County, the City of Spokane, Pend Oreille County, and Stevens County. Existing land uses within WRIA 55 have not been characterized in detail at this time. However, Spokane County and Pend Oreille County are currently undergoing this task in their respective areas due to the implementation of the Growth Management Act (Moser 1995 and Kelley 1995).

Existing land uses within the watershed vary greatly from pristine, state-owned forests to intensely developed urban areas. The existing land cover within the watershed is primarily forest interspersed with areas of forest-rangeland, agriculture, and urban development. The agriculturally based areas within the watershed are composed of a variety of uses, including fruit orchards, cultivated crops, grazing, and animal husbandry. The major urban and developed areas in the watershed are the City of Deer Park, the Town of Mead, and the northern portion of the City of Spokane. Other developed areas are minimal and limited to several small towns (populations less than 1,000) located in the northern portion of the watershed.

Over the last decade, land use changes within the watershed have been extensive, especially in the vicinity of Spokane. Economic growth has changed much of the area from predominantly rural lands to an urban environment. This land use change went virtually unchecked until 1981 when Spokane County adopted its current *Comprehensive Plan*.

The *1981 Comprehensive Plan* for Spokane County dictates the overall development scheme for the county areas outside the City of Spokane. This area encompasses approximately 60 percent of WRIA 55. Proposed land uses for the County portion of the watershed is predominantly classified as rural, with an average density of one unit for every 10 acres or more. The proposed land uses immediately adjacent to the City of Spokane reflect a suburban environment, including residential and neighborhood commercial areas.

CLIMATE AND PRECIPITATION TRENDS

The climate of WRIA 55 combines characteristics of a typical mountain/continental climate and a semi-arid climate. In the low lying central and southwestern portion of the WRIA, precipitation is relatively low compared to the northern and eastern upper elevation areas. Average annual precipitation for the area ranges from 17 inches at Spokane (Figure 1) to greater than 35 inches annually in the northern and eastern mountains (Map 2). Over the entire WRIA, precipitation averages approximately 25 inches annually.

Monthly precipitation patterns for the region (Figure 1) show that the period November through January experiences the highest amounts (approximately 38 percent of the annual total), and the lowest amount falls in July, August and September (approximately 12 percent of the annual total). Total annual snowfall averages 45 inches annually at Spokane and 60 inches annually at Newport and can be much higher in the mountains. Snow generally occurs from November to March. Mid-winter thaws are frequent, such that the snowfall does not accumulate all winter, particularly in the lower lying areas. Total annual snowfall represents approximately 30 to 40 percent of the average annual precipitation (assuming a water equivalent of 10 inches of fresh snow to one inch of rain).

Long term regional trends in precipitation indicate that recently, total annual precipitation has been slightly above normal compared to long term records beginning in the early 1900's for northeastern Washington (Colville and Spokane - Appendix A.1). Inspection of precipitation trends for Spokane and Newport (Figure 1) show similar trends since the 1930's. The long term precipitation record at Spokane (1889 to 1992) indicates that total annual precipitation declined between 1889 and 1930, increased between 1930 and 1950, and has since shown a slight downward trend. Since 1930, Newport has shown similar trends and Wellpinit has also shown a similar trend since 1950. Statistical straight line trend analysis of annual precipitation totals for Spokane over the entire period of record shows a slight overall increase in annual total precipitation (Appendix A.2). However, since 1948 the record indicates a downward trend.

Evaporation and transpiration (evapotranspiration) from plants (water lost through plant uptake and release to the atmosphere) is highest during the summer months. Potential evapotranspiration (the amount that would occur if water were always available) is estimated to range from 20 to 25 inches at lower elevations (PNRBC 1970). Actual evapotranspiration has been estimated to range between 10 and 12 inches annually (PNRBC 1970) over much of the area. Estimates developed for Deer Park (elevation 2,214 feet above mean sea level) indicate potential evapotranspiration of 23 inches annually and actual evapotranspiration of 14 inches annually (Chung 1975). Evapotranspiration may occur year round from plants (especially evergreens) and via sublimation even during periods when the air temperature is below freezing. However, the majority of the total annual evapotranspiration (80 percent or more) occurs during the months of May through September during periods of greater sunshine and higher temperatures.

HYDROGEOLOGY

HYDROLOGY OF THE WATERSHED

Water availability and distribution in WRIA 55 is determined by the components of the hydrologic cycle as it occurs throughout the basin (Figure 2). The hydrologic cycle can be viewed as an overall water balance, which enables an assessment of the component inflows and outflows in the watershed. The water balance begins with the total quantity of water input to the watershed. As can be seen in Figure 2, water originates as precipitation which replenishes surface water and ground water reservoirs. Precipitation provides the only inflow to streams, lakes and ground waters whose catchment areas are completely contained in the watershed. In some watersheds which do not encompasses the entire drainage area of the main water courses, large rivers and regional aquifers (ground water reservoirs) receive inflow from upstream catchment areas outside of the watershed. All WRIA 55 surface water drainages are contained within the watershed; however, ground water may be recharged from other watersheds.

Outflows from the watershed include water lost to the atmosphere from evapotranspiration (direct evaporation from water bodies and transpiration via plant uptake of water from the soil), flow out of the watershed from rivers and aquifers, and consumptive human use. A balance exists between the inflows and outflows within the watershed. Outflow cannot exceed inflow unless water stored within the watershed (in lakes, rivers and ground water reservoirs) is depleted. When inflow exceeds outflow, stored water increases in the watershed. Over the long term, gains and losses from storage tend to equalize, and outflow equals inflow. Thus, the total amount of water potentially available for maintaining streamflow, habitat and consumptive use is limited by the total inflow to the watershed.

The general hydrologic cycle or water balance for the Little Spokane watershed is described by the following equation:

$$P + IF = OF + Q + ET + \Delta S \qquad (1)$$

where

- P = total precipitation;
- IF = inflow from upstream ground water sources;
- OF = outflow from the watershed via rivers, streams and natural ground water discharge;
- Q = consumptive water withdrawal and water diverted out of the watershed from ground water and surface water sources for human uses;
- ET = evapotranspiration;
- ΔS = change in water stored within surface and ground water reservoirs in the watershed.

Applying the above equation and using general climatic data for the WRIA, approximately 500,000 acre-feet of water replenishes streams and ground water reservoirs each year on average.

The above analyses do not differentiate between surface water and ground water runoff. Outflow is derived from precipitation which is not lost to evapotranspiration. This water, called runoff, can either infiltrate into the ground recharging ground water, or it can flow to a stream over the ground surface. Runoff which recharges ground water causes ground water levels to rise (increasing storage). Ground water levels can also rise from water inputs originating outside of the watershed. For example, flood waters brought into a watershed from upstream can flow overland and seep into the ground (recharging ground water) or can seep into the ground from the river banks. Water recharging ground water in this way will also eventually flow back to surface water when the flood waters recede. When the ground water levels are higher than water levels in streams, ground water drainage occurs through openings in sediments and rock formations, slowly returning the infiltrated water to streams resulting in increased outflow. Hence there is hydraulic continuity between surface water and ground water which is a function of flow velocities through the ground. Ground water contained in rock fractures and pore spaces in sediments provides storage similar to a large lake or surface water reservoir.

The surface water and ground water runoff components of the water balance as they relate to watershed outflow are expressed as follows:

$$OF = IF + SR + GB - \Delta S \qquad (2)$$

where

OF =	outflow from the watershed via rivers, streams, and natural ground water discharge;
IF =	inflow from upstream ground water sources;
SR =	runoff to surface water via overland flow and direct precipitation;
GB =	infiltrating runoff, ground water recharge and subsequent discharge as baseflow to streams.
ΔS =	change in water stored within surface and ground water reservoirs in the watershed.

Consideration of the water balance equations show that increased consumptive uses and/or reduction in surface or ground water storage via consumptive use will reduce outflow from streams and rivers. This will reduce the amount of water available in the watershed for instream uses, either in the form of storage or streamflow.

As discussed above, the components of the annual water balance equation would be expected to be in balance with precipitation and inflow over the long term, with storage changes being minimized (Gray 1973). However, seasonal variability occurs in response to differences in precipitation and evapotranspiration patterns, as well as the affects of water storage in the snowpack.

The seasonal variability in the water balance results in seasonal variability in streamflow. Figures 3 and 4 shows long term annual and average monthly hydrographs for the Little Spokane River at Dartford, and for the period of record at Elk. The hydrographs exhibit similar characteristics including a strong seasonal peak in early to late spring (March and April), followed by the lowest flows during late summer (July and August). This pattern reflects winter snow accumulation (reducing streamflow) and subsequent snowmelt in the spring (increasing streamflow).

The lowest flows occurring in the summer coincide with the lowest precipitation and the highest evapotranspiration and irrigation use. Precipitation levels in the lowest flow months of July, August and September (less than 2 inches) is less than the expected total evapotranspiration. Without the effects of natural storage of water in the watershed, streamflows would be expected to be very low or near zero during these periods. Since the average monthly flows in July, August and September are not extremely low (maintained at 30 to 50 percent of the peak flows, and 70 percent or more of the average annual flow) the effects of watershed storage and gradual release through the summer are evident. Snowpack water storage is depleted in the spring and lake storage in the watershed is not large, therefore the storage is most likely ground water reservoirs which discharge to the Little Spokane River as baseflow.

The climatic variables of the water balance equation (P and ET) have been previously estimated for the WRIA; however, they tend to have less accuracy than streamflow because they require extrapolation over the entire area from few data points. Consumptive use (Q) is also relatively inaccurate because actual water use is not documented by the water users (except for the commercial or municipal users), and is not tracked by Ecology; also, undocumented or illegal water uses occur within the WRIA. Outflow from the Little Spokane River is probably also the most accurately measured variable, generally being reported to within 5 percent of the actual values (USGS 1984). Although changes in water storage within the WRIA could be tracked for both surface water and ground water reservoirs (e.g., ponds, lakes and aquifers), comprehensive monitoring of water levels in ground water and surface water is not being conducted and would be impractical.

GEOLOGY

The Little Spokane River Watershed lies at the transition between two of the major landform, or physiographic, provinces of North America: the Columbia Plateau Province, and the Northern Rocky Mountains Province (Fenneman 1931). The Columbia Plateau physiographic province is distinguished by broad and relatively flat topographic surfaces with deeply incised river drainages. These characteristics give rise to the Columbia Plateau's unique mesa-like landforms and steep-sided river canyons.

The Rocky Mountains rise steeply to the east from the lower and more subdued topography of the Columbia Plateau. The Mountains are characterized by long, somewhat linear belts of mountain ranges oriented north to south, separated by similarly oriented valleys. The lower ranges are rounded in appearance, while the higher ranges, having been affected by alpine-type glaciers in the past, are sharp crested. Where the major rivers of the region, such as the Clark Fork, cut across the ranges they form moderately steep-sided canyons with more or less straight river courses.

Because of its transitional location, the physiography of the Little Spokane River Watershed displays both types of landforms. The highlands to the east, north and west, such as Mount Spokane, the Selkirk Range, and the Huckleberry Mountains are typical of the Northern Rockies with their rounded lower summits and craggy high-peaks. The flat topped mesas of Green Bluff, Orchard Bluff, and Five Mile Prairies, on the other hand, are good examples of Columbia Plateau physiography. In the center of the watershed lies the Deer Park Basin, an area of subdued topography overlain by glacial and glacial outwash deposits and underlain by both basement and volcanic rocks (Map 1).

The rocks and soils of the watershed can be divided into three main stratigraphic units. These are from oldest to youngest: basement rock, basalt flows, and unconsolidated deposits (Cline 1969). These stratigraphic relationships and units are depicted in Table T1 and in Figure P1, Generalized Geologic Map. The geologic basement, or those rocks upon which all others rest, are in this area composed of metamorphic and igneous rocks of various ages. These rocks, for the purposes of a hydrogeological assessment, can be considered a single unit. Resting unconformably on the basement is the Columbia River Basalt Group which was formed as vast quantities of basaltic lava erupted from a series of volcanic vents situated in southeastern Washington and flowed across the ancient Miocene earth surface. At some locations beneath the basalts and at others interbedded with them are silts and sands of the Latah Formation which is the result of deposition in the ponds and lakes which resulted from damming of rivers by the lava flows.

The most recent deposits in the watershed are the result of deposition by the direct and indirect effects of the glacial advances into the region. These deposits include glacial till, glacial lake deposits, and flood deposits and the lithology is summarized in Table 1.

During a period of glacial advance in this region, an ice lobe crossed the course of the Clark Fork River near the present site of Lake Pend Oreille. The resulting ice dam caused water to back-up into the valleys of Montana forming what has been termed Glacial Lake Missoula. As climatic conditions warmed, and the glaciers began to retreat, a point was reached when the ice dam at Pend Oreille was no longer capable of holding back the enormous volume of water behind it. In a catastrophic failure, the dam was washed away and the entire contents of Lake Missoula flowed out and across the plateau of eastern Washington. The force of the water was so strong that in places deep channels were ripped into the basalt bedrock. In other places, such as the Spokane River Valley, thick deposits of gravel and sand were deposited, forming what is now the reservoir for the major aquifer in the area, the Spokane-Rathdrum aquifer.

The Palouse Formation silt, and other windblown deposits of sand resulted as the glacial deposits dried following the last glacial retreat. Along the present river and stream drainages are local accumulations of sand and gravel known generally as alluvium.

Table 1. Stratigraphy, Lithology and Water-Yield Characteristics for Units in the Little Spokane Watershed (WRIA 55)

Period	Rock Unit	Thickness (feet)	Lithology	Water-yield (gpm)
Quaternary	Alluvium	0-40	Silt sand and gravel along stream courses.	5-600
	Dune Sand	0-50	Sand	Non-saturated
	Glacial Flood Deposits	0-700	Boulders, cobbles, gravel, sand with varying amounts of silt.	600-20,000
	Glacial Lake Deposits	0-300	Silt, sand, and some clay.	5-600
	Glacial Till	0-40	Unsorted, boulders, cobbles, sand, silt and clay.	< 5
	Palouse Formation	0-75	Brown to tan silt and fine sand.	5-35
Tertiary	Columbia River Basalt and Latah Formation	0-2,000	Basaltic lava flows with silt and/or sand interbeds.	0-35
Pre-Tertiary	Basement	Unknown	Metamorphic and granitic rocks.	Mostly impermeable but with small, variable yield from fractured and weathered zones.

Information from Cline (1969)

GROUND WATER

Within the watershed six units provide ground water resources, these are: basement rocks, Tertiary volcanics (Columbia River Basalts) and Latah interbeds, Palouse Formation, glacial lake deposits, glacial flood deposits, and recent alluvium. Table 1 lists these units and includes typical yields for wells in them from data by Cline (1969).

The highest yielding aquifer in the region is the Spokane-Rathdrum aquifer (Molenaar 1988). This unconfined aquifer is present in the glacial-flood derived gravels deposited in the pre-glacial course of the ancient Spokane River where saturated. This aquifer is extremely important to the region in that it provides virtually all the potable water for the Spokane Metropolitan area. The Spokane/Rathdrum aquifer is present only in the southern portion of the Little Spokane Watershed. Wells within the Spokane-Rathdrum aquifer can be expected to yield in the hundreds to thousands of gallons per minute (gpm). This can also be seen in Map 3, in which ground water production by section is portrayed on a geologic map. The most production occurs in the southern end of the watershed.

Wells penetrating the glacial lake units can yield significant ground water resources. Some of the private and municipal wells in the Deer Park Basin which tap coarser sand and gravel beds within the generally fine grained sediments produce yields from 200 gpm to 600 gpm. Yields from wells drilled into recent alluvium in the river valleys of the Little Spokane Watershed vary greatly from 5 to 100 gpm. These alluvial deposits tend to be thin, and except in the lower Little Spokane are less than 40 feet thick. The coarser sediments return the best yields in general.

The second most important regional aquifer is a series of aquifers developed in fractured and weathered zones within the individual flows of the Columbia River Basalt. This aquifer system is the major source of water for domestic, agricultural, and industrial uses over a wide portion of central and southeastern Washington State. Included in this category are wells that develop aquifers in the Latah Formation sands and silts. Moderate yields up to 35 gpm can be expected from wells penetrating the broken and weathered flow interbeds. Latah Formation wells typically do not produce sustainable yields unless one of the rare, thin, gravel beds can be developed. In such cases yields of up to 35 gpm are also possible.

The basement rocks of the region provide locally important, but volumetrically insignificant sources of water primarily for domestic uses. These aquifers are present in fractured and weathered zones in the metamorphic and igneous rocks of the region. Typically of varied quality and low yield, these aquifers rarely produce enough water to sustain agricultural or industrial uses. As shown on Map 3, pre-basalt bedrock ground water sources are not extensively developed within the watershed. The best yielding wells of approximately 35 gpm tap the fractured and weathered pre-basalt surface. These wells are developed out of necessity. If other aquifers are available they are usually preferred.

The metamorphic and igneous basement rocks outcrop in the mountains where precipitation is greatest and are recharged directly from precipitation in the spring and fall and from snowmelt in the spring. Although total precipitation in the mountainous regions of the watershed is high, much of the precipitation occurs as snow and recharge to the aquifer from infiltration into the faults, fractured zones, and weathered zones within the metamorphic and igneous basement rocks is probably low due to steep slopes, high runoff rates and thin or absent soils. Small amounts of recharge water may also enter the bedrock aquifer from overlying aquifers where the hydraulic gradient is downward. However, this source is regulated by the thickness and permeability of intervening strata.

Recharge to the aquifer units within the watershed occurs from direct precipitation where the aquifer outcrops, from stream seepage where the aquifer unit intersects the base of the stream, and from bank storage or flood water infiltration. The rate at which infiltration occurs is based on the type and extent of vegetative cover, physical properties of the surficial and underlying soils, amount of available storage, temperature, rainfall intensity, and water quality. The alluvial and glacial aquifers outcrop in the stream and river valleys and hence, recharge primarily occurs across the areal extent of the outcrop. Recharge to the ground water in WRIA 55 occurring through downward percolation of precipitation and snowmelt during winter and early spring is estimated to amount to approximately 160,000 acre/feet or about one-fifth of the annual precipitation (Cline 1969). One third of the annual water available for surface and ground water runoff after evapotranspiration.

Recharge also occurs from seepage out of the Pend Oreille River and into the aquifers underlying the East Branch of the Little Spokane River (see next section). In the spring, high surface water flows are sustained by snow melt in the upper elevation headwaters. During high flows, some of the available water goes into stream bank storage and some of the water seeps into the aquifer. In addition, flooding of rivers causes subsequent recharge to the soils and aquifers underlying the flood plain. The alluvial aquifer is also recharged with surface water that is diverted for irrigation of lowland areas during the late spring and summer; however, the amount of recharge is unknown.

Seasonal variation in ground water level appears to be directly correlated to winter precipitation levels. In years with abnormally low winter precipitation, ground water levels will remain somewhat depressed. In years with higher precipitation rates, the recovery from low ground water levels is more drastic. These conditions are most pronounced in ground water systems with local or limited recharge area such as the basalt aquifers of the eastern mesas. In the case of the glacial flood aquifer (Spokane-Rathdrum aquifer), recharge is from a much larger watershed (most of which is outside of the Little Spokane WRIA) and so seasonal variation is much less pronounced.

GROUND WATER AND SURFACE WATER INTERACTION

Recharge to an aquifer from stream seepage will occur when the water level in the stream is higher than underlying ground water levels. The rate of seepage is dependent on the magnitude of the water level difference and the permeability of the stream bed materials. Alluvial aquifers in hydraulic continuity with a river or stream typically experience a high degree of water exchange with the associated surface water. These aquifers discharge to streams during low flow periods and receive recharge from the stream during high flow periods. This is due to the relatively high permeability of the alluvial materials and the close proximity of the aquifer with stream or river. Aquifers that are separated from surface water bodies by depth or distance, are confined and/or are composed of low permeability materials require greater periods of time for water exchange to occur resulting in attenuation or dampening of the seasonal variability in ground water and surface water interactions.

The source of the ground water is from direct infiltration of precipitation, especially through the permeable Quaternary deposits (Map 3), but may also be due in part from recharge out of the Pend Oreille River just north of the watershed boundary (Chung 1975). The permeable geologic materials located in the northeast corner of the watershed are continuous underneath the Pend Oreille River, allowing for hydraulic connection between the Pend Oreille and the aquifer within the Little Spokane watershed (Chung 1975).

Where the aquifer materials outcrop at the surface in the lower reaches of the streams and rivers, ground water generally discharges to streams. Streams that drain the mountains generally derive one-fifth to one-third of their average discharge from ground water (PNRBC, 1970). The ratio of ground water to surface water generally ranges from a few percent during periods of high flow to 100 percent during periods of low flow (PNRBC 1970).

The majority of natural ground water discharge in the watershed occurs as baseflow to the Little Spokane River. In low flow periods (August and September), flows at Dartford total approximately 150 cfs and consist primarily of ground water inflow (Chung 1975). During typical summer low flow periods, ground water baseflow (discharge to the Little Spokane River) represents nearly the entire discharge in the mainstem of the River (65 to 110 cfs) with the remaining flow originating in the headwaters of the Little Spokane River (Chung 1975). Ground water baseflows are also maintained at a relatively high level in the East Branch of the Little Spokane River upstream of the confluence with the West Branch as measured at the discontinued gaging station at Elk (Chung 1975).

Downstream of Dartford, it is estimated that 105,000 gpm (234 cfs) are added to the streamflow of the lower Little Spokane River in a four mile reach of the river up to the confluence with the Spokane River. Up to 20,000 gpm (45 cfs) of this increase occurs in just 5 springs (Cline 1969). It is believed that most of this baseflow is the result of discharge of the Spokane-Rathdrum Aquifer into the river along this stretch. However, up to one quarter of it may be the result of discharge from ground waters originating in the upper portion of the Little Spokane River Watershed (Cline 1969).

The USGS estimates flow in the Little Spokane at its confluence with the Spokane River by multiplying the flow at Dartford by 1.09 and adding a constant of 252 cfs (USGS Spokane Field Office, personal communication, 1995). This formula estimates the flow within ten percent. The constant in the equation (252 cfs) indicates a relatively large inflow that is independent of streamflow variability as gaged at Dartford. This constant is representative of a constant baseflow source, and corroborates the large gain in baseflow for the reach (234 cfs) as identified by Cline (1969). The baseflow gain nearly doubles the average annual discharge in the Little Spokane River as gaged at Dartford of 300 cfs. Ground water inflow along this lower section of the river maintains wetlands and rich riparian vegetation (EWU 1991).

STATUS OF GROUND WATER RESOURCES

The densest concentration of wells and highest ground water use is in the Quaternary deposits in the central portion of the WRIA, and in the Columbia River basalt beds (Map 3). Generally, the south and east portions of these geologic units are the most heavily utilized. The aquifers located in the quaternary deposits are in direct hydraulic connection with surface waters, including tributary streams to the Little Spokane and the Little Spokane River itself. Limited ground water has been developed in the northern portion of the WRIA and in areas underlain by metamorphic bedrock.

Since the 1950s, ground water appropriations have increased steadily at a rate of approximately 3,000 gpm per year, until the 1980s when appropriations began to level off. The exact quantity of use is not determined, however, as wells are not metered and water right holders are not required to report actual use. In many years, the full appropriation may not be utilized.

To assess future ground water appropriations, the impact of the additional water withdrawal on availability of ground water for senior rights and for maintaining base flows to streams (including existing surface water rights) must be assessed to insure that the senior water rights or other beneficial water uses are not impaired. Additionally, the ground water source must be of sufficient quantity and quality for the intended use.

Ground water would be available for appropriation if a proposed ground water withdrawal (1) does not reduce surrounding water levels excessively such that surrounding wells can still obtain permitted quantities, (2) does not induce streamflow loss from streams, and (3) does not induce excessive streamflow loss from streams such that flows decrease below low flow criteria. Wells located too close to each other or too close to a stream (well interference), can cause excessive water level declines resulting from the cone of depression even though recharge to the aquifer is adequate to maintain year round supplies. In some cases, however, ground water withdrawals can exceed recharge rates and cause long-term water level declines as well. Ground water appropriations that result in long-term declines would gradually impact adjacent ground water rights and possibly surface water rights.

Ground water level trends are not well documented in the WRIA. Since the 1980's, Ecology has monitored water levels in several wells in the Green Bluff area (northeast of Spokane in Township 27N Range 44E, Map 3). Ground waters in this area discharge to Deadman Creek and Little Deep Creek. The ground water level monitoring data from this area generally indicates declining water levels (Appendix A.3); however, the total extent of decline is unknown since data prior to 1980 is not available for comparison. Ground water levels in other areas of WRIA 55 have not been monitored, hence, water level decreases over time have not been identified. Without more complete data on ground water level trends in other areas, it is difficult to develop appropriate ground water management strategies that would avert further declines and focus efforts to maintain instream baseflows in the Little Spokane River.

Ground water use in WRIA 55 exceeds surface water use (see water demand section), drawing heavily from aquifers which are hydraulically connected with the Little Spokane River and its tributaries. These withdrawals affect ground water discharge to streams, and would be expected to reduce baseflows (because of increase in consumptive uses) which are dependent on ground water discharge. This is especially the case in the western and southern portions of the watershed where ground water use is the greatest. However, as previously mentioned, the exact locations and amounts of ground water use that are having the largest impact on streamflows cannot be determined without additional ground water monitoring data.

WATER USE AND DEMAND

Records for water use in WRIA 55, the Little Spokane River Watershed, date back to the early 1900s. Water use is not metered at the present time and therefore, actual water use is not known. Numerous recorded or claimed rights may no longer be in use and it is also possible that illegal water users may be using water for irrigation and other purposes. Additionally, the number and quantity of exempt water uses, including single domestic use (less than 5,000 gallons per day) and some stock water uses are not documented and may be cumulatively significant.

Since water law requires Ecology to protect existing rights and claims, it is assumed that all recorded water rights and claims are fully in use today and represent consumptive water use. The location and quantity of ground water and surface water claims and rights that are registered with Ecology are presented on Maps 3 and 4 respectively. Water demand for ground water and surface water use in WRIA 55, the Little Spokane River Watershed, are summarized from available information from Ecology including:

- Watershed Assessment Water Rights and Claims Database for consumptive uses only (Ecology 1994); and
- Primary Water Rights Report from Water Right Information System (WRIS) (Ecology 1995a).

A summary of claims, water rights and applications is presented in the following paragraphs including:

- number of claims, water rights and applications for ground water and surface water use;
- quantity of use;
- primary uses of ground water and surface water; and
- locations of water rights.

CLAIMS

The Claims Registration Act (Chapter 90.14 RCW) was enacted to document those uses of surface water in existence prior to the adoption of the State Surface Water Code (Chapter 90.03 RCW), which was adopted in 1917, and those uses of ground water in existence prior to the adoption of the State Ground Water Code (Chapter 90.44 RCW), which was adopted in 1945. The Claims Registration Act established a period to register claims for ground water and surface water use. Documentation was submitted to Ecology on either a long form to claim detailed uses for domestic and irrigation uses or on a short form for a single domestic use with up to one-half acre non-commercial lawn and garden. Claims registries (i.e., long and short forms) as of July 1, 1994 were included in the Watershed Assessment Water Rights and Claims Database (Ecology 1994).

Short claim forms did not specify the quantity of water usage. For WRIA 55, Ecology assigned a quantity for ground water and surface water use for each claim. For ground water claims, quantities, Q_i [gallons per minute (gpm)] and Q_a (acre-feet per year), were assigned by Ecology as follows:

- If irrigated acreage is greater than 0 acres: Q_i = [# of acres claimed] * 9 gpm and Q_a= [# of acres claimed] * 4 acre-feet per year; and
- If irrigated acreage is 0 acres: Q_i = 9 gpm and Q_a = 2.0 acre-feet per year.

For surface water claims, quantities, Q_i [cubic feet per second (cfs)] and Q_a (acre-feet per year), were assigned by Ecology as follows:

- If irrigated acreage is greater than 0 acres: Q_i = [# of acres claimed] * 0.02 cfs and Q_a= [# of acres claimed] * 4 acre-feet per year; and
- If irrigated acreage is 0 acres: Q_i = 0.02 cfs and Q_a = 2.0 acre-feet per year.

A total of 4,612 claims were filed including 3,621 ground water claims for a total of 18,654 acre-feet per year and 56,781 gpm (126.5 cfs); and 991 surface water claims for a total of 25,158 acre-feet per year and 133.54 cfs.

WATER RIGHTS - PERMITS AND CERTIFICATES

Since the adoption of the state surface water and ground water codes, the only means of acquiring a water right within the state is by making an application for and receiving, a Permit and or subsequent Certificate from Ecology or its predecessors. An applicant must file a Water Right Application with Ecology when a water user or future water user (applicant) expects to:

- use any amount of surface water for any purpose;
- use more than 5,000 gallons per day of ground water (well) for any and all purposes including domestic, commercial, industrial, and/or irrigation; or
- use ground water to irrigate more than one-half acre.

A Water Right Permit is issued to the applicant if Ecology determines that:

- The use will be beneficial;
- The use will be in the public interest;
- The water is available;
- The use will not impair senior water users.

The Water Right Permit allows the applicant to proceed with the development of the water use. Upon approved appropriation, a Certificate documenting the authorized water use is issued.

As shown in Figures 8 and 9, ground water and surface water use has increased steadily throughout the years. A total of 1,237 permits and certificates were filed including 496 ground water permits/certificates for a total of 106,585.94 acre-feet per year and 141,065.3 gpm (314.3 cfs); and 741 surface water permits/certificates for a total of 67.63 cfs. The total quantity of surface water allocated per year is not provided for all permits and certificates. However, the reported quantity allocated for surface water is 7,812.43 acre-feet/year.

The primary uses for the ground water and surface water permits and certificates are illustrated on Figures 10 and 11. The principal ground water use is municipal domestic, specifically, 39 percent of the quantity allocated of ground water in the watershed. The principal surface water use is irrigation, specifically, 75 percent of the quantity allocated to surface water in the watershed. The total quantities per use, including the total number of rights, are shown in Table 2.

Ten percent of the ground water rights account for 69 percent of the allocated ground water use volume. The largest ground water user is City of Spokane, which has 4 ground water permits totaling 29,520 acre-feet/year and 29,700 gpm (66.2 cfs). The four permits accounts for 28 percent of the total permitted ground water quantity and 21 percent of the total permitted instantaneous withdrawal in the watershed.

Eight percent of the surface water rights account for 50 percent of the allocated surface water use volume. However, the surface water permits are comprised of many small quantity permits. The largest surface water user accounts for only 3 percent of the total allocated in the watershed.

APPLICATIONS

Issuance of a permit after an application has been filed may take one to three years (Ecology 1995b). The Water Right Applications used to prepare this portion of the report are assumed not to have been issued a Permit. The requested quantities shown on the applications and as presented in the WRIS report were used in the preparation of the report.

There are 43 applications divided into 31 ground water applications for 14,370 gpm (32 cfs); and 12 surface water applications for 2 cfs. The total yearly quantity of Q_a (acre-feet/year) was not reported in applications filed. The location of the applications is presented on Map 5. The requests for water by purpose of use can be seen in Figures 6 and 7. Ground water use was requested for domestic multiple, domestic municipal, irrigation, fire protection and domestic single. Domestic multiple and domestic municipal were the largest ground water use requested at 39 percent and 38 percent, respectively. Surface water use was requested for stock watering, wildlife propagation and domestic single. Stock Watering was the largest surface water use requested at 51 percent.

Table 2. Quantities for Purpose of Use for WRIA 55

Purpose	Total Q_i (cfs)	Total Q_i (gpm)	Total Q_a (acre-feet/year) (a)	Total Irrigation (acres)	Number of Rights
Surface Water Rights					
Domestic General	0.02	9	2	0	2
Domestic Multiple	3.288	1,476	459.9	0	46
Domestic Single	12.334	5,535	736.6	0.75	393
Fire Protection	0.318	143	27.65	0	8
Fish Propagation	0.10	45	4	0	1
Irrigation	50.29	22,750	6,469.38	4,443.02	256
Stock Watering	1.25	561	109	0	34
Wildlife Propagation	0.03	13	3.9	0	1
Claims (specific use unknown)	133.54	59,933	25,158	NA	991
TOTAL SURFACE WATER RIGHTS	201.17	90,285	32,970	4,443.77	1,732
Ground Water Rights					
Domestic General	1.30	585	76.6	0	3
Domestic Multiple	78.22	35,103.3	22,930.3	0	121
Domestic Single	22.52	10,106	575.5	1	167
Fish Propagation	0.14	65	1	0	2
Irrigation	71.95	32,293	17,602.51	5,788	140
Stock Watering	4.69	2,103	414	0	21
Commercial & Industrial Manufacturing	29.59	13,280	20,701.43	0	12
Heat Exchange	1.11	500	800	0	2
Mining	1.89	850	108	0	4
Domestic Municipal	100.81	45,245	42,151.6	0	22
Railway	2.08	935	1,225	0	2
Claims (specific use unknown)	126.52	56,781	18654	NA	3,621
TOTAL GROUND WATER RIGHTS	440.83	197,846	125,240	5,789	4,117
Combined Surface and Ground Water Rights					
TOTAL SURFACE WATER AND GROUND WATER RIGHTS	642	288,131	158,210	10,233	5,849

(a) - only Total of Q_a reported

SUMMARY

The total quantity of ground water allocated by both rights and claims is 125,240 acre-feet/year and 197,846 gpm (440.8 cfs). Including applications, the total quantity allocated for possible future use is 212,206 gpm (472.8 cfs). An estimate for total quantity Q_a (acre-feet/year) for ground water is not available. The total quantity of surface water allocated by both rights and claims is 201 cfs and including applications, total quantity is 203 cfs. An estimate for total quantity, Q_a, was provided only for surface water use claims, and is 25,158 acre-feet/year. The numbers represent reported quantities only. Actual usage may be less or more (i.e., due to unutilized claims/permits or illegal uses) than the quantities stated above.

MINIMUM BASE FLOWS

Minimum baseflows were established in 1976 for the mainstem of the Little Spokane River from the headwaters to the confluence with the Spokane River (WAC 173-555). The baseflows are specified for each month of the year (Figure 3) at four locations or compliance points including the reach from the headwaters to the abandoned Elk gaging station, Elk to Chattaroy, Chattaroy to Dartford and Dartford to the confluence (Appendix A.4). Continuous flows are gaged currently only at Dartford. Ecology collected discrete stream flow measurements generally between June and September at the Elk gaging station between 1986 and 1990 (Appendix A.5). Since continuous streamflow records are only available at Dartford, complete compliance with instream flows along the other reaches of the river cannot be evaluated.

From Figure 3, average monthly flows generally meet the required baseflows throughout the year at both the Dartford and Elk gaging stations (recent trends at Elk cannot be assessed). However, flows at Dartford indicate that over the period of record (1929-1931 and 1948-1991; 47 years of record) required baseflows are not met on average 46 days a year, distributed through the summer months (Appendix A.4). Usually, flows below the minimum baseflows are concentrated in low flow years during which baseflows are below required levels for much of the summer and occasionally during the winter and spring as well. The number of days that baseflows are not met were very high during the years of 1929 to 1931, and where generally met during all years between 1948 and 1970. Since 1970, however, baseflows below minimums have increased significantly. Between the years 1948 and 1978, baseflows were below minimums on average 8 days per year. Since 1970, the number of days has increased to 53. Discrete flow measurements at Elk indicated minimum baseflows were not met in 1987, 1988, and 1989. Two of the seven flows measured in 1990 were less than the required baseflows.

WAC 173-555 also specifies seasonal stream closures to further consumptive appropriation in WRIA 55 except domestic and normal stock watering purposes. The seasonal stream closures (June 1 through October 31) are for the headwaters to the mouth (including all tributaries) for Dry Creek, Otter Creek, Bear Creek, Deer Creek, Dragoon Creek, Deadman Creek and Little Creek. The West Branch of the Little Spokane River is also closed for the reach downstream of Eloika Lake, and all natural lakes in the basin are closed. The stream and lake closures prevent any new water appropriations for the period June 1 to October 31.

WAC 173-555-040 specifies future (post-1976) water allocation limits (in cfs) during specific time periods in the East Branch of the Little Spokane River, and in the mainstem of the Little Spokane River. During typical low flow periods (August and September), a total of 5 cfs was available for allocation in the East Branch of the Little Spokane River and 11 cfs was available for consumptive allocation in the Little Spokane River as gaged at Dartford. Since 1976, approximately 5 cfs of surface water and 30,000 gpm (67 cfs) of ground water have been allocated in WRIA 55 for consumptive uses (Figures 8 and 9). Due to the hydraulic connection between ground water and surface water in the watershed, a large portion (if not most) of the ground water allocated since 1975 would directly impact surface water flow. Based on this, it is very likely that reductions in low flows (as indicated by increasing number of days that regulated minimum flows are not met) in recent years results in large part to the allocation of more than the 11 cfs specified as available in the WAC.

As previously mentioned, flow limitations and closures on the mainstem of the Little Spokane River and its tributaries cannot be monitored directly because stream gages are not maintained at specified compliance points except Dartford. Because of this limitation in streamflow data, areal differences in baseflow upstream of Dartford cannot be distinguished, and therefore specific compliance with WAC 173-555 cannot be adequately assessed. The gage at Dartford is generally used by Ecology to determine when regulation may be required. As previously discussed, the flows at the confluence with the Spokane River are estimated based on a USGS formula (flow at the confluence = 1.09 x flow at Dartford + 254 cfs). Hence, the gage at Dartford is used to monitor general compliance of all upstream and downstream flow; however, flow limitations in specific tributaries or reaches of the Little Spokane River cannot be identified.

Surface water source limitations and the basis for each limitation are documented and summarized in Table 3. As seen in this table, the limitations are generally based on fisheries concerns, but are also limited in order to meet baseflow requirements in the Little Spokane River mainstem.

Table 3. A Summary of Surface Water Limitations for the Little Spokane River Basin.

Stream	Tributary To	Status*	Documentary Basis	Remarks
All Natural Lakes in WRIA		Closed 6/1 -10/31		Closed except to domestic and stock water
Bear Creek	Little Spokane River	Closure (6/1 - 10/31)	Letter, Fisheries: 4/13/53	Closed except to domestic and stock water
Dartford Creek (Little / Sheep Creek)	Little Spokane River	Closure (6/1 - 10/31)	Letters, Game: 7/8/48, Fisheries: 6/6/50	Closed except to domestic and stock water
Deadman Creek (Peone Creek)	Little Spokane River	Closure (6/1 - 10/31)	Letters, Fisheries 4/10/53, 12/3/74, Games: 3/14/68, 3/21/69, 10/20/72, 11/28/61	Closed except to domestic and stock water
Deep Creek (Little Deep Creek)	Deadman Creek	Closure (6/1 - 10/31)	Letter, Fisheries: 4/13/53	Closed except to domestic and stock water
Deer Creek	Little Spokane River	Closure (6/1 - 10/31)	Letter, Game: 2/29/68	Closed except to domestic and stock water
Dragoon Creek	Little Spokane River	Closure (6/1 - 10/31)	Letters, Fisheries 8/29/47, 6/6/50, 1/21/54, 5/25/56, 3/10/52, Game: 10/9/53, 4/12/51, 7/2/51, 9/21/64, 12/5/47, 3/2/61, 8/9/68, 11/23/73	Closed except to domestic and stock water
Dry Creek	Little Spokane River	Closure (6/1 - 10/31)	Letters, Fisheries: 5/26/52, 5/23/52	Closed except to domestic and stock water
Little Spokane River	Spokane River	Base Flow		
Moon Creek	Sacheen Lake	Closure	Letter, Game: 7/2/51, 8/1/67, 10/26/67, 4/10/68	Closed except to domestic and stock water
Otter Creek	Little Spokane River	Closure (6/1 - 10/31)	Letters, Fisheries: 4/14/54, 6/17/52, Game: 2/23/71, 9/20/74	Closed except to domestic and stock water
Unnamed Stream	Little Spokane River	Closure (6/1 - 10/31)		Irrigation denied
Bigelow Gulch Creek		Adjucated	Spokane Superior Court: 7/9/28	
Ice House Creek	Chain Lake	Low Flow	Letters, Fisheries: 8/1/52, Game 12/13/66	
Unnamed Spring/Stream	Little Spokane River	Closure		Irrigation denied
Unnamed Spring/Stream	Cottonwood Creek	Low Flow	Letter, Game: 5/11/73	Closed except to domestic and stock water
West Branch Little Spokane River	Little Spokane River	Low Flow	Letter, Fisheries: 6/17/52	Closed except to domestic and stock water
Unnamed Stream	Little Spokane River	Adjudication		Petitioned 7/11/71
Unnamed Stream	Little Spokane River	Low Flow		
Unnamed Spring/Stream	Eloika Lake & West Branch Little Spokane River	Low Flow	Letter, Fisheries: 6/17/52	Closed except to domestic and stock water

* This WRIA now under Basin Management program (WAC 173-555)

WATER QUALITY

This section includes compilation of historical water quality indicator data for surface water, and any available ground water quality indicator data for specific aquifers. These data are obtained from pertinent reports, the EPA STORET data base and the USGS.

There are no permitted point sources (discharges from a specific location or outfall with technology based controls) within the Little Spokane River basin that are known to contribute to water quality standard violations (Ecology 1992). Non-point sources (those with no specific discharge point or outfall) of pollutants in the Little Spokane River basin that potentially affect the river are principally agriculture and natural sources with other contributions from on-site sewage disposal, stormwater and highway runoff, forest practices, land development, landfills, and mining.

The Federal Clean Water Act (Section 303 [d]) and federal regulations (40 CFR Part 130.7) require Washington State to develop a 303 (d) list every two years. The list is compiled and submitted by Washington State Department of Ecology to the United States Environmental Protection Agency for approval. The list describes the health of Washington's rivers, coastal waters, estuaries, and lakes. The listing of "troubled waters" is used by the state to set environmental priorities for action and to chart water quality trends. Water bodies must meet two criteria to be placed on the list including: 1) water quality does not meet state water quality standards, and 2) technology-based controls are not sufficient to achieve water quality standards. Waters on the list exceed standards for bacteria, temperature, siltation, oxygen levels, nutrients, and toxic compounds or heavy metals. The list helps Ecology determine if there are human health concerns, dangers to fish and wildlife, and what kinds of uses the waterbody will support or impair.

In 1992, a statewide water quality assessment indicated that waterbodies in the Little Spokane River basin were not water quality limited and therefore had no section 303(d) categories, although several waterbodies were exceeding state standards (Ecology 1992). These waterbodies and potential limiting factors are summarized below.

- The Little Spokane River (48.6 miles) was not meeting swimmable and fishable goals of the Federal Clean Water Act and water quality standards for priority pollutants. Causes included metals (cyanide and mercury), inorganics, and pathogen indicators such as fecal coliform. Sources included agriculture, landfills, hazardous waste sites, and in-place contaminants.

- Diamond Lake (800 acres) was considered threatened for supporting uses due to nutrient levels. Causes included land development, sludge, removal of riparian vegetation, and natural sources.

- Eloika Lake (622 acres) was considered as having impaired aesthetic enjoyment due to nutrients, siltation, and taste and odor. The sources were unknown. Presently an on-going water quality improvement project is in place to reform water quality in this lake.

- Sacheen Lake (317 acres) was considered impaired for aesthetic enjoyment due to eutrophication. No causes or sources were identified.

The 303(d) list released for 1994 included the Little Spokane River from the confluence with the Spokane River to river mile (RM) 48.6 and Deadman Creek from the confluence with the Little Spokane River (RM 13.1) to the head waters at big springs (Map 6). The Little Spokane River was listed because fecal coliform, temperature, and pH exceeded water quality standards. Deadman Creek exceeded water quality standards for temperature and pH (Ecology 1994). Both of these are considered class A (excellent) waterbodies (Chapter 173-201A WAC). This classification is used to provide general guidelines for water use and water quality criteria as described in the Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A WAC). In general class A waters should meet or exceed the requirements for all or substantially all uses. Examples of these uses include all types of water supply (i.e., domestic and cattle watering), successful migration and propagation of fish and wildlife, and recreational activities.

Figure 12 provides a data summary of water temperatures in the Little Spokane River during the years 1960 through 1966. This data is the most recent long-term series of data found that can provide seasonal trends. This data is taken from a station near Dartford at the confluence of the Little Spokane River with the Spokane River. This data provides a general idea of the seasonal variation within the Little Spokane River. Temperature fluctuates considerably on an annual basis. The summer temperatures are highest June through August with temperatures exceeding 22°C (71°F) at times in July and August.

These high summer temperatures are not compatible with cold water species such as trout and exceed the state standards. In general, the guidelines established by the Water Quality Standards for Surface Waters of the State of Washington provide that temperatures shall not exceed 16°C (60.8°F) and that temperature increase resulting from non-point source activities shall not exceed 2.8°C and the maximum water temperature shall not exceed 16.3°C. The withdrawal of water from surface or ground water can have a significant effect on water quantity and thus temperature of the remaining water; however, it is probable that water temperatures under natural conditions would also exceed 16°C. During the winter months, temperatures reach near freezing, especially during the months of December through February.

Dissolved oxygen values show an inverse (opposite) trend to that of temperature with higher values during the winter months and lower values for the summer months (Figure 13). This is expected since cold water is capable of having a higher concentration of oxygen than warmer water. For the years recorded in the time series, every year had dissolved oxygen concentrations below the state standard. The state standard provides that dissolved oxygen shall exceed 9.5 mg/L (Chapter 173-201 WAC). The low oxygen levels normally occur during the months of July and August.

Map 5 provides a summary of areas where water quality is known to impose a limit on a fish populations ability to annually perpetuate. In the Little Spokane watershed, there are about 51 percent (over 400 miles) where limiting water quality factors are present throughout the entire year. Eight percent (61 miles) of the watershed streams are known to be limiting during only part of the year or are only mildly limiting in nature and in 16 percent (126 miles) there are no known limiting factors.

Approximately 26 percent of the watershed streams (205 miles) have no data to make a determination (WARIS 1994).

Ground water is generally of good to excellent quality throughout the watershed. Dissolved solids commonly are less than 200 mg/l in water from the alluvial deposits, 250 mg/l in water from the basalt of the Columbia River Basalts Group, and 500 in water from the sedimentary basement rocks. The water ranges from soft to hard and hardness generally ranges from 50 to 150 mg/l. Most of the water utilized from the metamorphic and igneous basement rocks is obtained from springs or from wells at shallow depths. Water from deeper wells or from springs with deep sources may be more highly mineralized and high in calcium, magnesium and bicarbonate.

FISHERIES AND AQUATIC RESOURCES

This section provides a compilation of fisheries habitat and fish presence information from available databases and communications with entities collecting such information. At present, existing fisheries information available for the basin is limited and much of the information is not complete and/or not analyzed. Washington Water Power has collected some fisheries information on the Little Spokane River and its tributaries. WDFW has a GIS data base (WARIS) that appears preliminary in nature and is still being developed. WDNR and USFWS have not conducted fisheries work in the basin.

Table 4 provides a list of species known to inhabit the Little Spokane watershed. Also included in the table are the linear miles of stream and percentage of stream miles where they are documented as being present (WARIS 1994). This table is provided to give the reader a general idea of the fisheries resources that exist in the basin. For example, approximately 84 percent (675 miles) of the watershed streams either have a no fisheries data designation or no fish species are present. The WARIS data base does not distinguish between the two designations.

The fisheries resources of the Little Spokane River in the state of Washington has been changed extensively by downstream dams. There are no anadromous fish found in the basin most likely due to conditions that prevent migration of these species. Anadromous species are those that ascend rivers from the ocean to spawn, with some species rearing 1 to 3 years, and then return the ocean where they grow to adults.

Historically, it is unknown if anadromous fish species of salmon and steelhead utilized this portion of the basin for migration, spawning, and rearing. Although, due to its location, it is probable. Salmon are formerly known to ascend the Spokane River to an impassable falls near Spokane. In 1883, the estimated indian catch in this area was approximately 2,000 fish. Below the falls, fish were present prior to 1882 but declined until 1894 when numbers were considered few, although steelhead still occurred in considerable numbers. The Nine Mile Falls Dam was completed on the Spokane River in 1908, and the Little Falls Dam in 1910. By 1918 chinook salmon, coho salmon, and steelhead runs had practically disappeared from the Spokane River (NWPPC 1986).

The two most common sport fish in the basin at present are resident rainbow trout and Eastern brook trout (Table 4). There also appears to be significant populations of sculpin species (WARIS 1994). In 1990, Washington Water Power conducted fish sampling (electrofishing) in the lower reach of the Little Spokane River (Johnson 1995). They found that mountain whitefish made up approximately 56 percent of the relative catch, largescale and longnose suckers were 29 percent and rainbow trout 9 percent. Fish species captured by Washington Water Power that are not listed in Table 4 include chiselmouth and longnose suckers.

Approximately 4 percent (31 miles) of the watershed streams provide known key reaches (areas) of spawning habitat which are critical to perpetuation of a fish population. About 73 percent (580 miles) are considered as not having critical spawning habitat or the absence of spawning habitat. Twenty three percent (180 miles) have no data to make a determination on critical spawning habitat.

Table 4. Fish species list and relative distribution data within the Little Spokane River Watershed (WARIS 1994).

Common Name	Species Name	Miles	Total Percent of Miles
*	No species associated with these segments.	675	84%
Resident Rainbow Trout	*Salmo gairdneri*	117	15%
Sculpin (General)	*Cottidae spp.*	116	15%
Eastern Brook Trout	*Salvelinus fontinalis*	54	7%
Northern Squawfish	*Ptychocheilus oregonensis*	39	5%
Kokanee Salmon	*Oncorhynchus nerka*	32	4%
Mountain Whitefish	*Prosopium williamsoni*	23	3%
Brown Trout	*Salmo trutta*	19	2%
Largescale Sucker	*Catostomus macrocheilus*	15	2%
Carp	*Cyprinus carpio*	12	1%
Speckled Dace	*Rhinichthys osculus*	9	1%
Redside Shiner	*Richardsonius balteatus*	9	1%
Westslope Cutthroat Trout	*Salmo clarki*	6	1%
Yellow Perch	*Perca flavescens*	3	< 1%
Largemouth Bass	*Micropterus salmoides*	3	< 1%
Grass Pickerel	*Esox americanus vermiculatus*	3	< 1%
Brown Bullhead	*Ictalurus nebulosus*	3	< 1%
Black Crappie	*Pomoxis nigromaculatus*	3	< 1%

STATUS OF STREAMFLOW

All surface water withdrawals within WRIA 55 directly affect streamflow in the Little Spokane River as all streams feed the Little Spokane. Similarly, ground water withdrawals also affect flow in the River, particularly ground water in the alluvial and glacial aquifers which are in direct hydraulic connection with the Little Spokane River and its tributaries. The total water withdrawals in the WRIA, as indicated by permitted water rights, are approximately 642 cfs instantaneous (31 percent surface water and 69 percent ground water) and 218 cfs on an annual average (158,210 acre-feet per year) of which 80 percent is from ground water withdrawals. The majority of ground water withdrawals occur from the alluvial and glacial aquifers which are directly connected to streams.

Although Little Spokane River flows are currently gaged only at Dartford, minimum flows are also established at the confluence with the Spokane River, at Elk, and at Chattaroy. Low flows within the upstream tributaries to the Little Spokane River and in the Little Spokane River directly impact flows measured in the Little Spokane River at Dartford. Therefore, when the minimum flows as stipulated in WAC 173-555 for Dartford are not met, upstream flows at Elk and Chattaroy are probably not being met either. However, specific tributaries or areas that may be exhibiting lower flows cannot be isolated without more upstream gages and minimum flows on the Little Spokane River at Elk and Chattaroy cannot be presently assessed.

Since water use in the WRIA has steadily increased since the 1950s, it is expected that subsequent declines in streamflows would have occurred. Total allocated water use (158,210 acre-feet per year) is on the order of 30 to 35 percent of the water available for runoff (both surface and ground water) according to the general water balance for the watershed. This indicates that a large percentage of the water available for appropriation is already allocated on a watershed basis. Surface water and ground water applications for instantaneous water use total 34 cfs which accounts for an additional 5 percent of the water available for runoff. Some of the water developed for consumptive uses will eventually return to the river via subsurface flow from septic tanks, runoff and infiltration from irrigated fields, and as direct discharges; however, the quantity of this return flow is unknown and is probably considerably less than the amount that is consumptively used. A large percentage will also be evapotranspired such that actual evapotranspiration will more closely approximate potential evapotranspiration. Increased evapotranspiration will effectively remove this water from streamflows particularly during the summer low flow periods.

Statistical trend analysis of annual average streamflows in the Little Spokane River at Dartford shows declining streamflows since 1948 (Appendix A.2). Inspection of the hydrographs (Figures 3 and 4) indicates that the declines occurred in the river as gaged at Elk between 1948 and 1971 as well as at Dartford, and have continued up to the present. The streamflow declines are coincident with declines in precipitation as observed at Spokane since 1948 (Appendix A.2). However, the trend slopes of the precipitation and flow data, compared from 1948 to the present after normalizing the data bases (divided by the mean to make them dimensionless and therefore directly comparable statistically), indicates that the streamflow declines have been more rapid than the precipitation declines indicating the effect of consumptive water withdrawals.

Low flows in the Little Spokane River and its tributaries vary aerially across the WRIA in response to precipitation, geologic and hydrogeologic factors and water withdrawals. Estimated 10-year 7-day low flows for the Little Spokane River at Elk are 0.3 cfs per square mile of watershed (35 cfs) and at Dartford 0.14 cfs per square miles of watershed (92 cfs) (USGS 1984). Ten-year 7-day low flow estimates for the West Branch of the Little Spokane River are much less, at 0.05 cfs per square mile (2.8 cfs)(Chung 1975). These differences reflect ground water conditions which provide baseflows to the streams. The West Branch of the Little Spokane is underlain in large part by metamorphic bedrock with low ground water storage and discharge capacity whereas the East Branch and the mainstem are underlain in large part by the alluvial and glacial aquifers which yield much larger ground water discharge. The difference between the East Branch and the mainstem at Dartford is due to increased ground water withdrawals, reduced average precipitation and increased evapotranspiration, as geologic conditions are similar on average for both.

Although the permitted annual withdrawals are small compared to the average annual flow in the Little Spokane River, withdrawals during low flow periods in the river can be critical. Low flow records (1-day, 7-day, 30-day, 60-day and 90-day) for 1930-1993 (period of record) and 1966 - 1993 (recent record, incorporating increased water use) were compared for the Little Spokane River streamflows at the Dartford station. For the less frequent low flow events (50-year and 100-year), the extremes in the recent period of record are higher than low flows for the full period of record. This is likely due to extreme low flows occurring in the early record (i.e., the 1930's) and is a function of the length of the record. More frequent events (5-year and 2-year) were lower in the recent record than in the full period of record suggesting increased recent (1966-1993) water usage may be impacting the average low flow.

The low flow variability is also indicated by LaFrance (1975), who estimated that for the upper reaches of the West Branch Little Spokane (underlain almost completely by metamorphic rock), the unit 10-year 7-day low flow is 0.003 cfs per mile square, Bear Creek is 0.04 cfs per mile square and Otter Creek is 0.21 cfs per mile square. These results further indicate the relationship between watershed location, water use and geology with low flows. Bear Creek and Otter Creek are both centrally located in the WRIA and underlain by alluvial and glacial aquifers. Precipitation and evapotranspiration would be expected to be similar for both drainages due to their proximity to each other. However, the Bear Creek drainage includes significant water withdrawals whereas Otter Creek has very few withdrawals. Periodic streamflow measurements compiled by Ecology (Appendix A.5) indicate the occurrence of extreme and zero low flows in several tributaries to Deadman Creek including 2 unnamed creeks and Peone Creek.

The availability of streamflow for additional appropriation can be evaluated via the following equation for both long and short term application (Chung 1975):

$$SA = ST - SI \qquad (3)$$

where

SA = Streamflow Available

ST = Total Streamflow reasonably available for use (assumed to be the average flow, i.e., the 50 percent probability that the flow level will be available)

SI = Minimum Instream Flow Requirement to assure senior water rights and habitat conditions

Applying the above equation to the Little Spokane River at Dartford, it is apparent that under current conditions over an annual period, there is inadequate water available for future appropriations many days each year (on average 53 days per year since 1970, see Appendix A.4) due to flows below the minimum instream flow requirement. As previously discussed, WAC 173-555-040 specifies 11 cfs was available for future (post-1976) allocation in the Little Spokane River; however, approximately 72 cfs of surface and ground water have been allocated in WRIA 55 since 1976. The seasonal use of allocated water is unknown; however, even if 16 percent of the water allocated since 1976 is used during low flow periods, the 11 cfs identified as available for use in the WAC would be exceeded. The current inadequate water availability is likely due also due in part to reduced precipitation since 1970. The instream flow requirement affects all reaches and tributaries upstream of Dartford, as flow data is not available to assess upstream compliance points for minimum flows.

DISCUSSION AND CONCLUSIONS

A decline in streamflow in the Little Spokane River at Dartford and an increase in the number of days per year that baseflows fall below instream flow requirements has been documented over recent years. The considerable quantity of additional water allocated since 1976 and this general decline in streamflow and increase in deviations for instream flow requirements suggests that the resource is over allocated in some areas of the watershed. However, the degree and the location of over allocation cannot be assessed without a more comprehensive streamflow network and better definition of the effect of natural variation in climatic variables on streamflow.

The current data base is insufficient to assess or distinguish the amount of streamflow decline that is related to increased consumptive water uses in the basin, natural variability and/or decline in precipitation. This is because actual water uses are not documented, and the relationship between declining streamflows and declining precipitation cannot be adequately defined. Understanding the natural variation in precipitation and streamflow and the variation attributable to human impacts is important in resolving water right conflicts, planning for future allocations, and developing an overall water resource management strategy.

The major conclusions regarding the state or "health" of water resources in the Little Spokane River watershed include:

- reductions in stream flows to levels that do not meet minimum instream flow requirements have increased over time;
- streamflow and ground water declines have been more rapid than the precipitation declines indicating the effect of consumptive water withdrawals in the basin; and
- increasing impact of non-point source pollution on instream water quality.

The key water management issues include:

- Declining baseflows and increasing violation of regulated minimum instream flows;
- Reliance of stream baseflow levels on ground water and high degree of ground water and surface water continuity and inter-dependence;
- Increasing amount of non-point source pollution in the watershed;
- Enhancement and preservation of the Little Spokane scenic river reach;
- Increasing limitations on the availability of water and future water allocations; and
- Inability to assess instream flow compliance upstream of Dartford.

It is interesting to note that since 1980 new water allocations have leveled off and so have declines in baseflow, indicating a reduction in cumulative impacts to water availability. Preparing appropriate strategies to manage and maintain all of the beneficial uses of the resource in the future will require more accurate understanding of ground water and surface water trends, refined and possibly more flexible instream flow requirements, and development concepts that conserve or allocate less water while preserving current uses. Additionally, future water allocation decisions will require development of innovative water use concepts and consideration of the tradeoffs necessary to prevent excessive streamflow declines.

RECOMMENDATIONS

Managing water resources in WRIA 55, and specifically evaluation of ground and surface water rights applications in the watershed, require consideration and assessment of water quantity, quality and use. Resolution and understanding of these issues will enable better management decisions designed to preserve senior water rights, aquatic habitat, water quality, and determine the best strategies for additional albeit limited water development in the WRIA. Lack of information concerning streamflows, particularly at instream flow compliance points, and ground water conditions in the watershed limit the ability to address these issues. Specific recommendations to provide information and strategies to address water management issues include:

- Establish/re-establish streamflow gages at minimum flow compliance points as specified in WAC 173-555.
- Re-establish select streamflow monitoring locations within the existing Ecology network for tributary streams in the WRIA as permanent gaging stations.
- Establish a ground water level and water quality monitoring network for the WRIA.
- Develop a methodology to track the quantity of water actually used in the watershed in order to distinguish natural fluctuations in flow with those effected by consumptive use.

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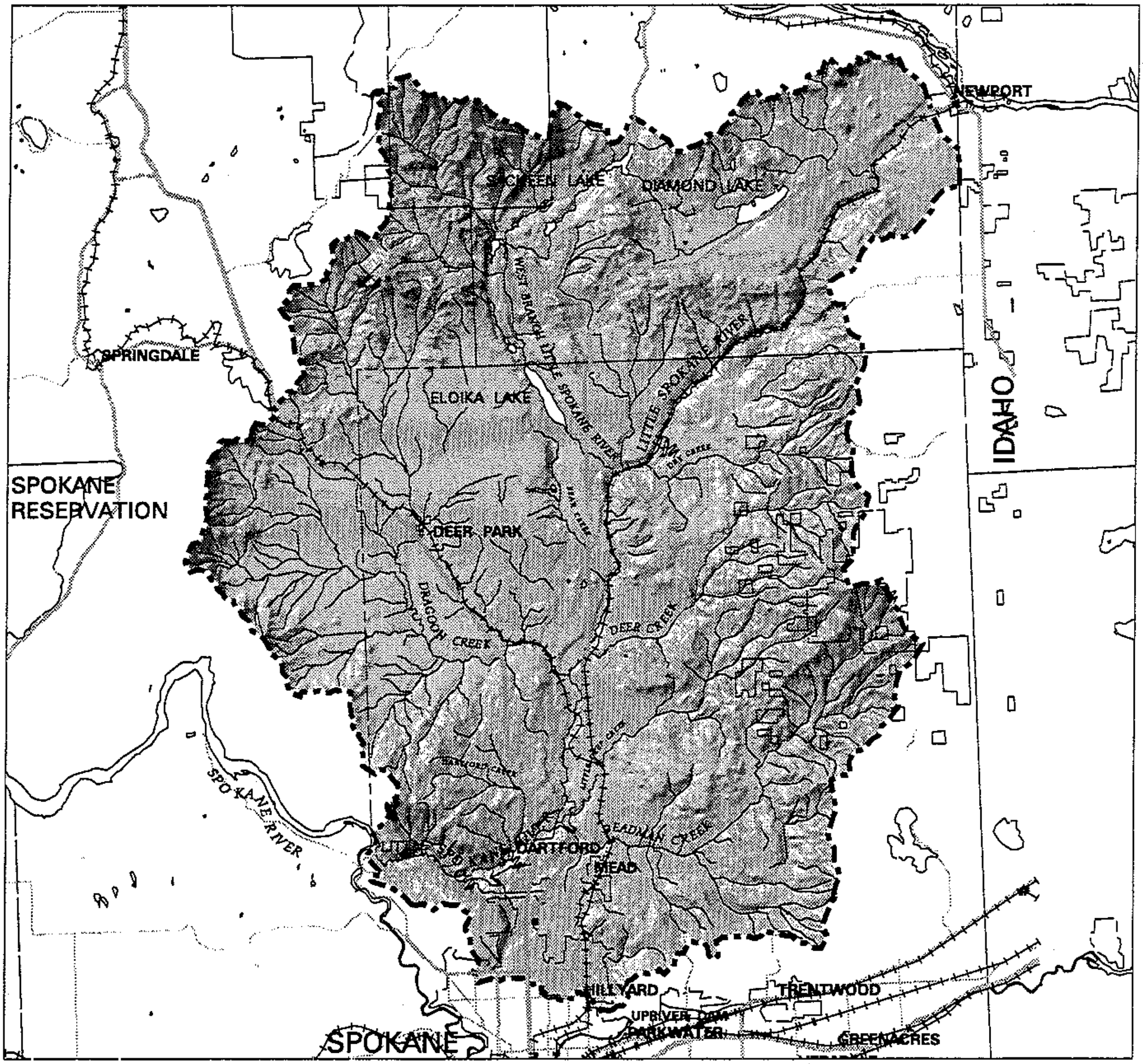
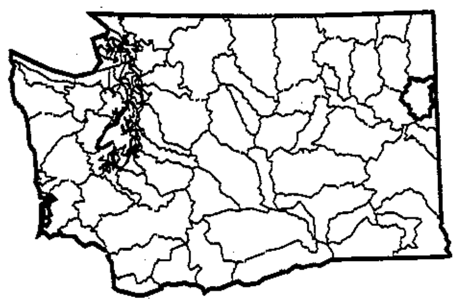
MAPS



BASE MAP

LEGEND

- Water Bodies
- Springs (GNIS)
- Mine (GNIS)
- Roads (DLG)
- Study Area Boundary (WRIA's)
- Streams & Rivers (WARIS, 1993)
- Railroads (DLG)



LITTLE SPOKANE (WRIA 55)

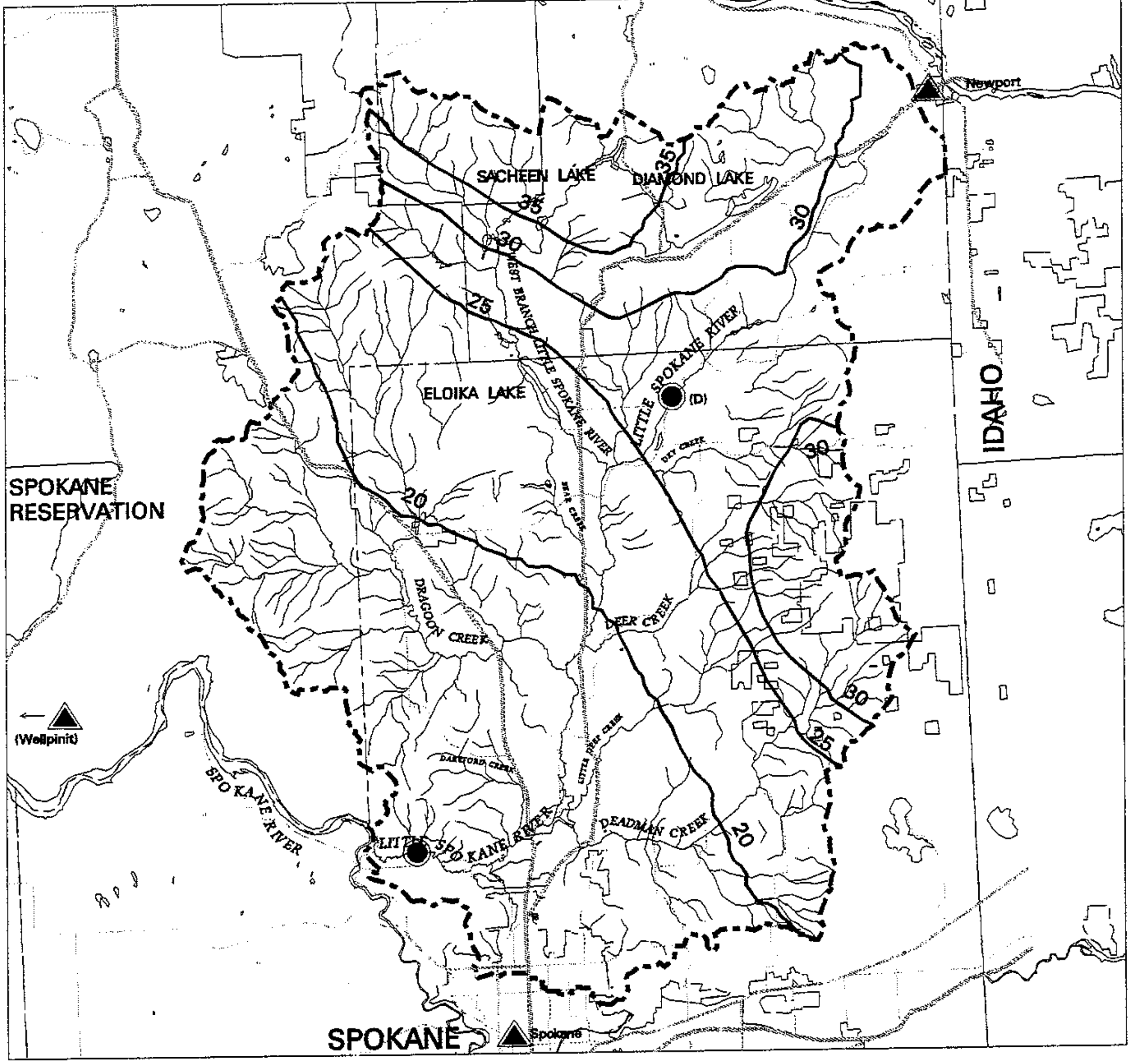
MAP 1

Washington Department of Ecology

Watershed Assessment

5 0 5 10 15

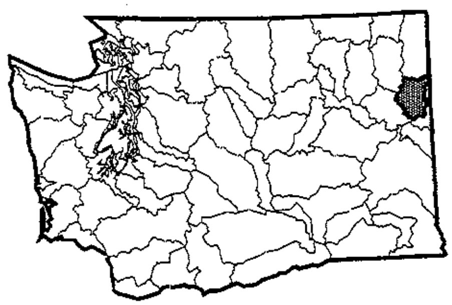
miles



ANNUAL PRECIPITATION

LEGEND

- ● Stream Gage (USGS) (D = Discontinued)
- ▲ Climate Station (NOAA)
- 5 Inch Precipitation Isohyets



LITTLE SPOKANE (WRIA 55)

MAP 2

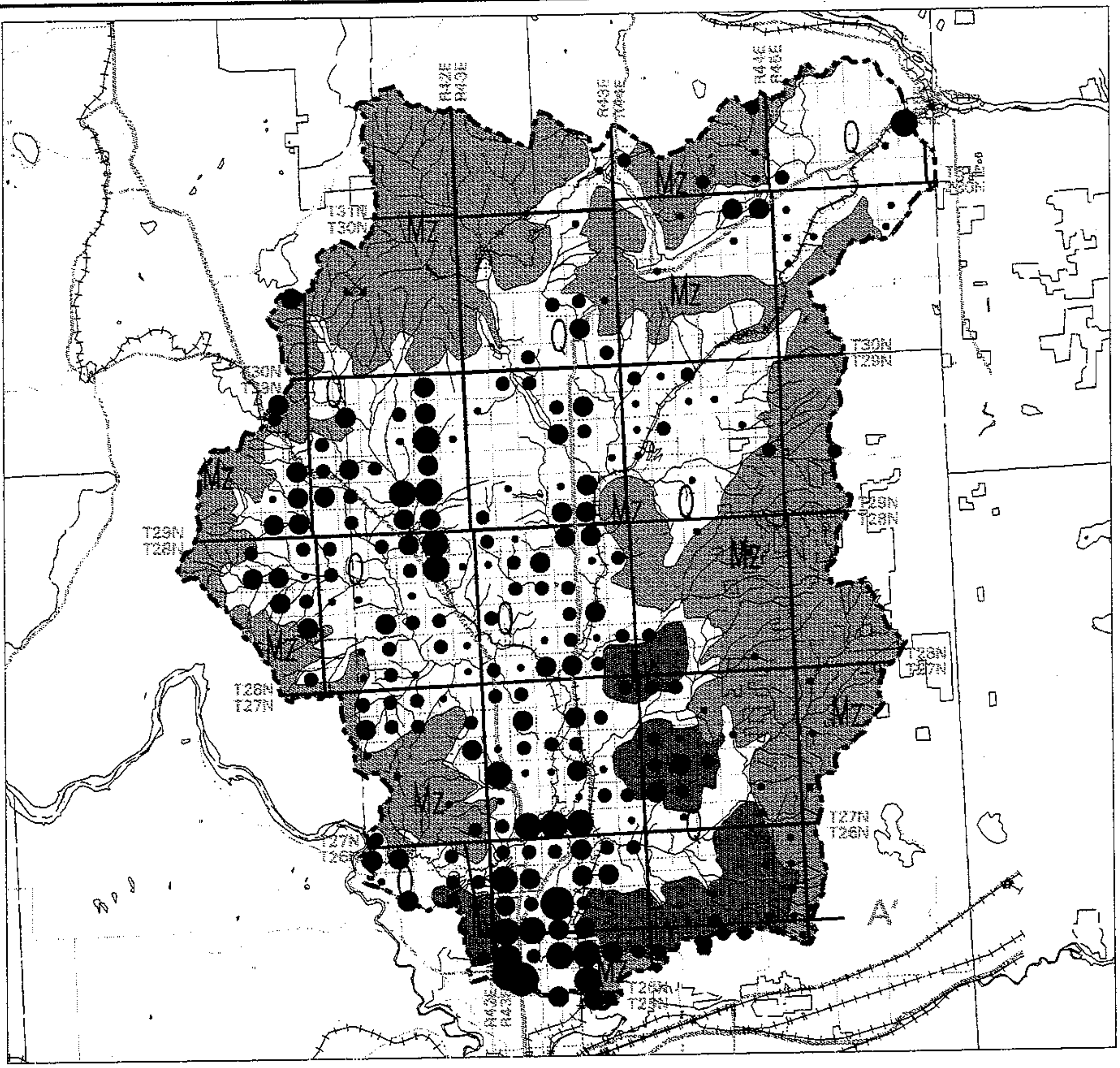
Washington Department of Ecology

Watershed Assessment

5 0 5 10 15

miles

May 10, 1995



GROUND WATER USE AND GENERALIZED GEOLOGY

LEGEND

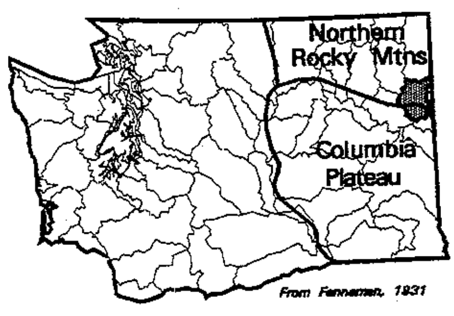
- > 10,000 Acre-Feet/Year
- 1,000-10,000 Acre-Feet/Year
- 100-1,000 Acre-Feet/Year
- 5-100 Acre-Feet/Year
- < 5 Acre-Feet/Year

Generalized Geologic Features
From Cline (1969), and Joseph (1990)

- Q — Quaternary overburden includes alluvium, glacial, glaciofluvial, loess, and wind blown deposits
- Miocene Columbia River Basalts, includes Latah Formation interbeds
- Mz — Mesozoic and older metamorphic rocks and intrusives

A ⎣____⎦ A'
Geologic cross-section location

Physiographic Provinces



From Fenneman, 1931

LITTLE SPOKANE (WRIA 55)

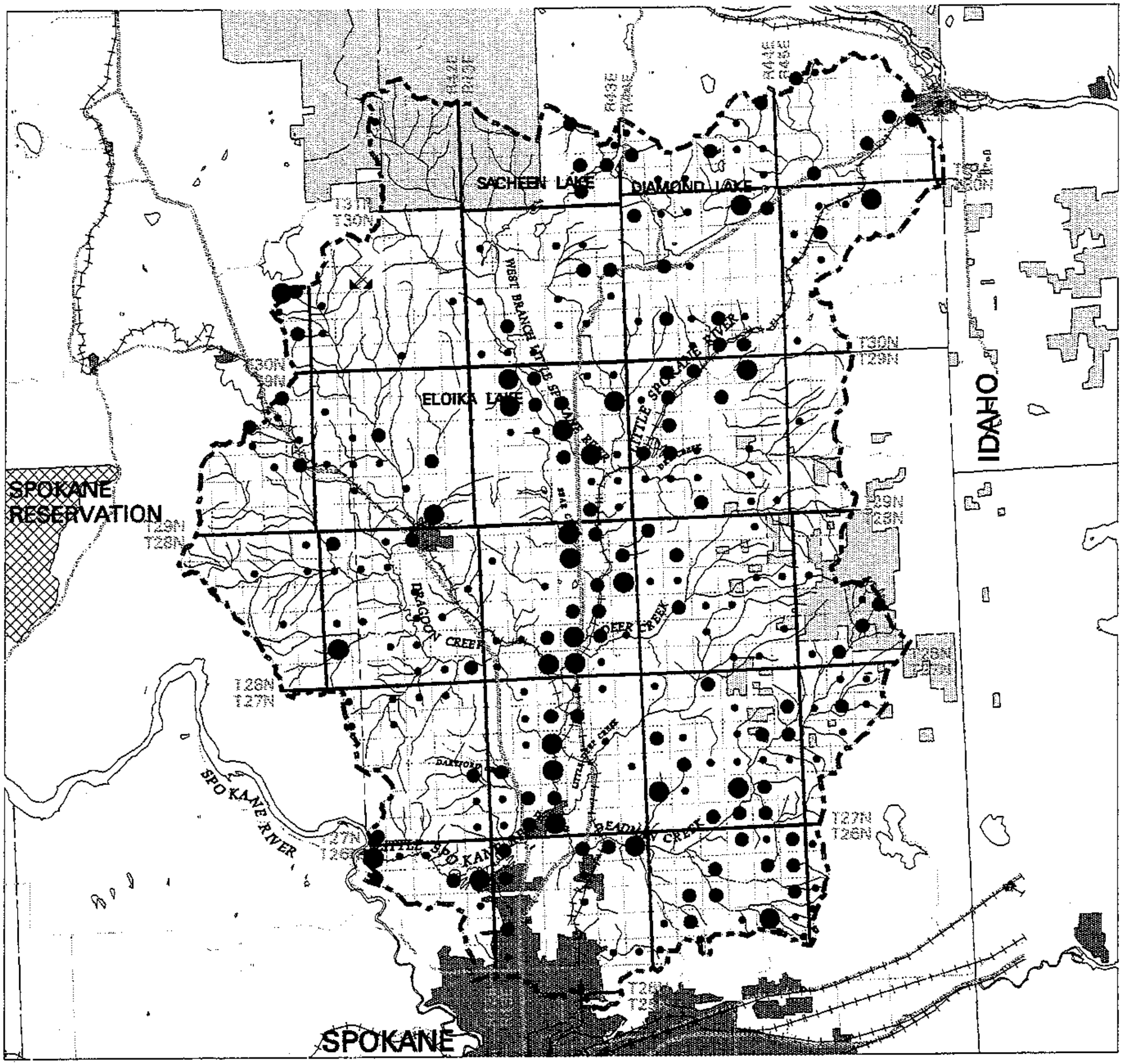
MAP 3

Washington Department of Ecology

Watershed Assessment

5 0 5 10 15
miles

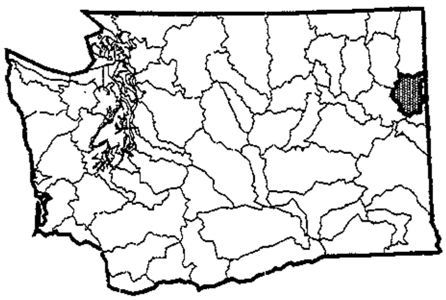
May 05, 1995



SURFACE WATER USE

LEGEND

- ● 100-1,000 Acre-Feet/Year
- ● 5-100 Acre-Feet/Year
- • < 5 Acre-Feet/Year
- Developed Areas (100k USGS Quad)
- National Forest/ Misc. Public Land (100k USGS Quad)
- Indian Reservation (100k USGS Quad)
- Study Area Boundary (WRIA)
- Township Boundaries



LITTLE SPOKANE (WRIA 55)

MAP 4

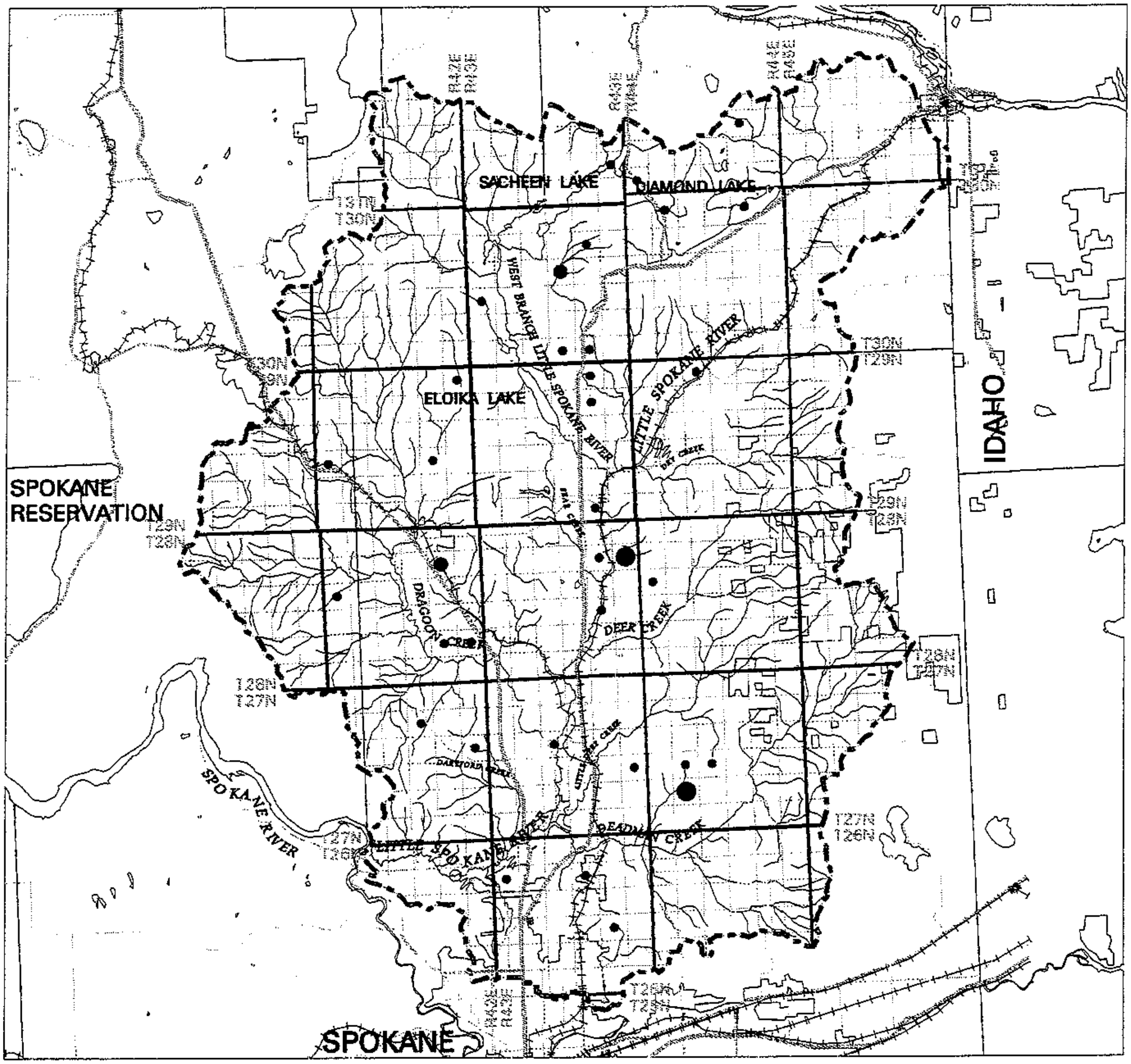
Washington Department of Ecology

Watershed Assessment

5 0 5 10 15

miles

May 04 1995



LOCATION OF WATER USE APPLICATIONS

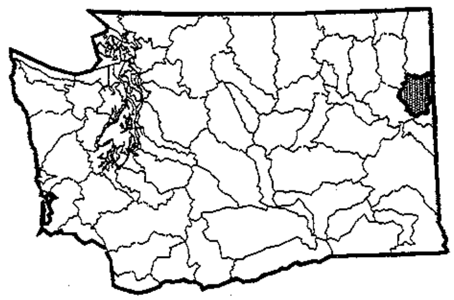
LEGEND

Number of Applications per Section
(Groundwater and Surfacewater)

- 1
- 2
- 3 or more

Study Area Boundary (WRIA)

Township Boundaries



LITTLE SPOKANE (WRIA 55)

MAP 5

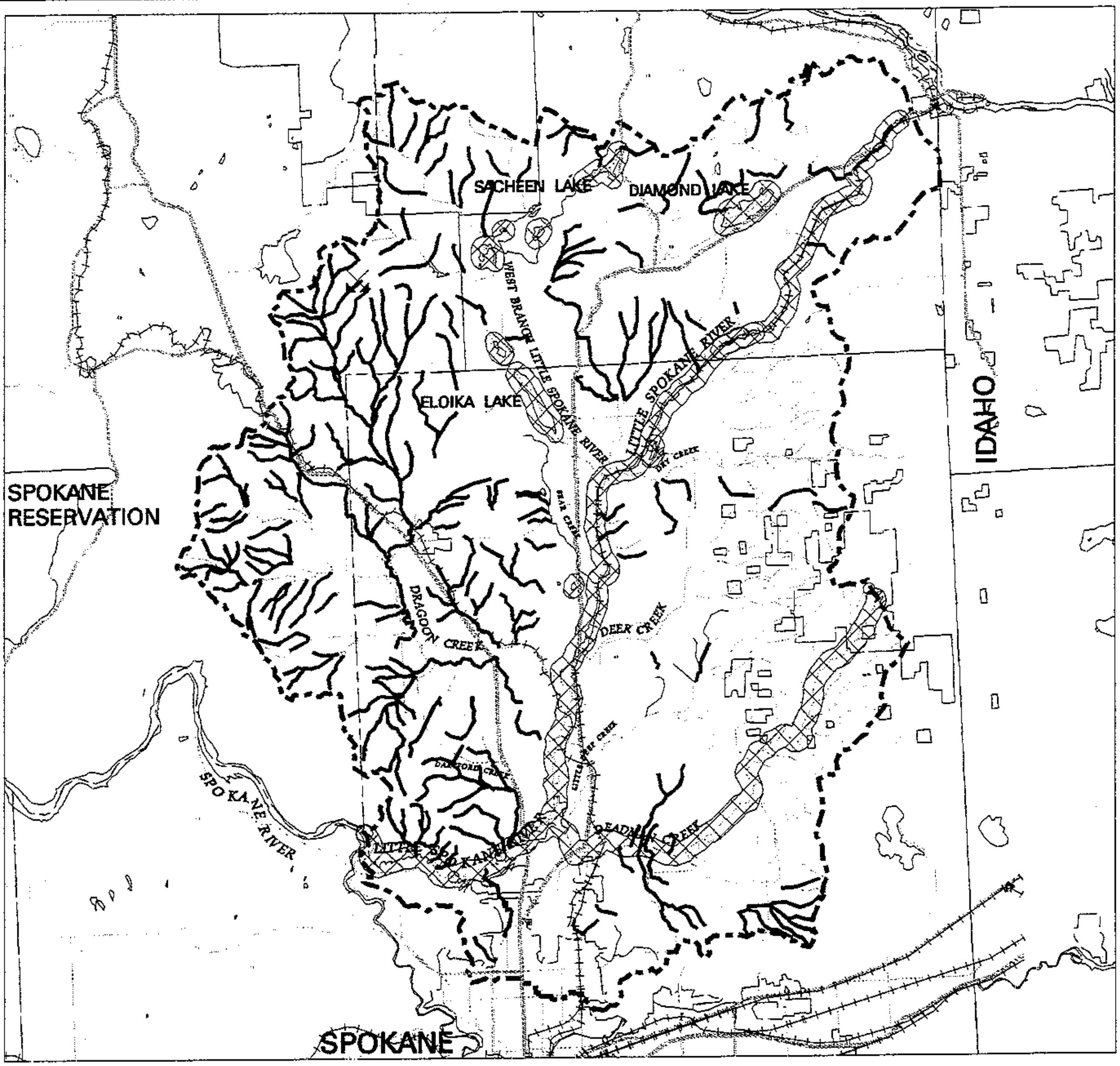
Washington Department of Ecology

Watershed Assessment

5 0 5 10 15

miles

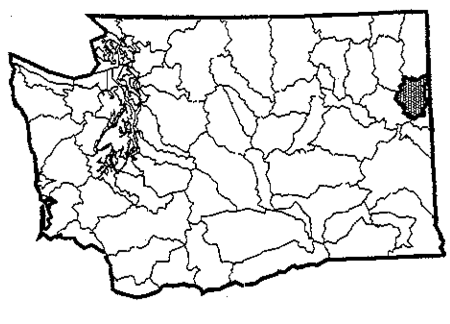
May 05, 1995



WATER QUALITY MAP

LEGEND

- 303d Water Bodies (WDOE)
- Springs (GNIS)
- Mine (GNIS)
- No Known Water Quality Limiting Factors to Fish Populations or No Data Available (WDFW, 1993)
- Water Quality Limiting Factors Not Annual in Occurrence or Only Mildly Limiting to Fish Populations (WDFW, 1993)
- Water Quality Limiting Factors Present and Annually Impact Fish Populations (WDFW, 1993)
- Study Area Boundary (WRIA)
- Roads (DLG)
- Railroads (DLG)



LITTLE SPOKANE (WRIA 55)

MAP 6

Washington Department of Ecology

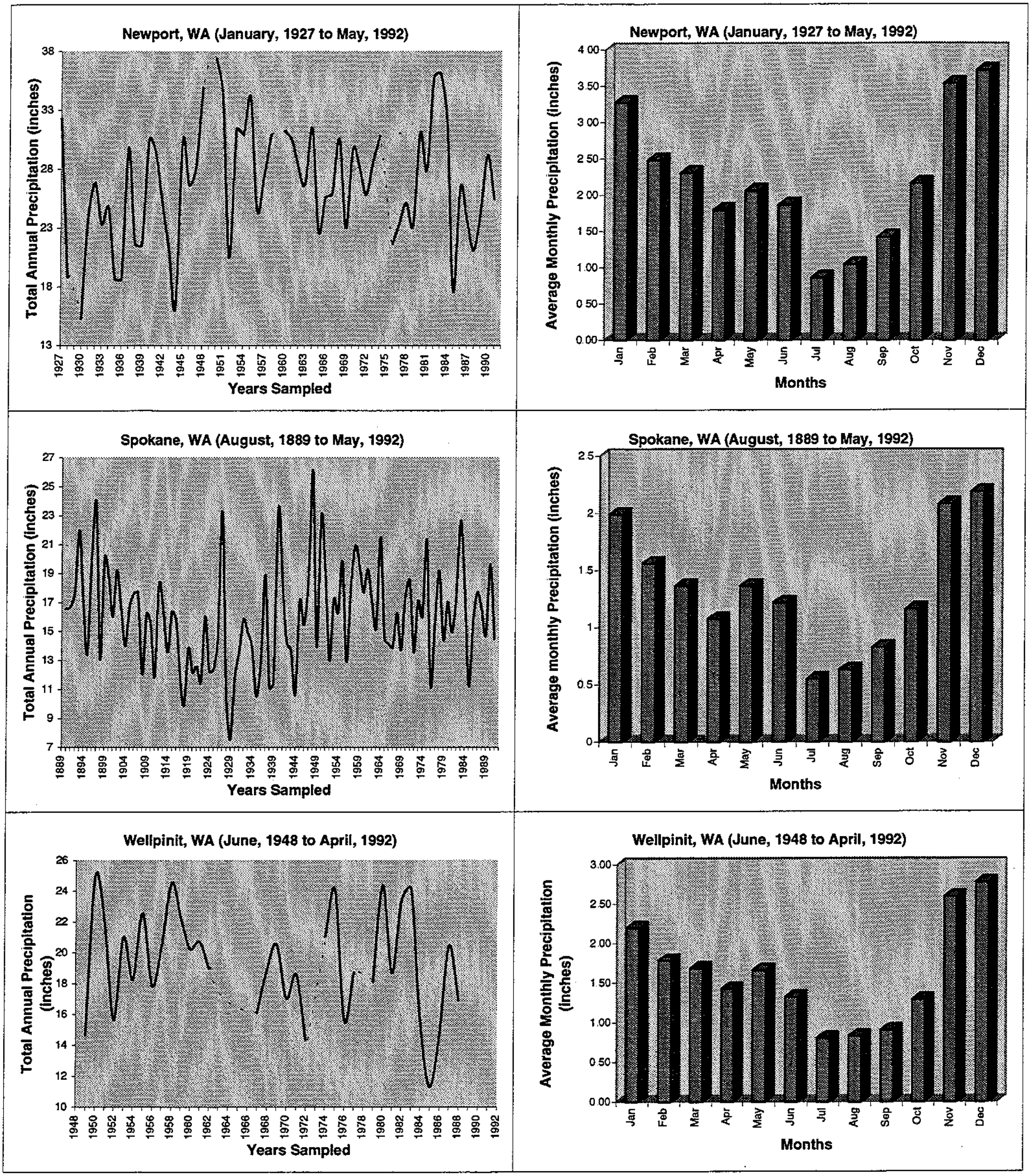
Watershed Assessment

5 0 5 10 15

miles

April 18, 1995

FIGURES

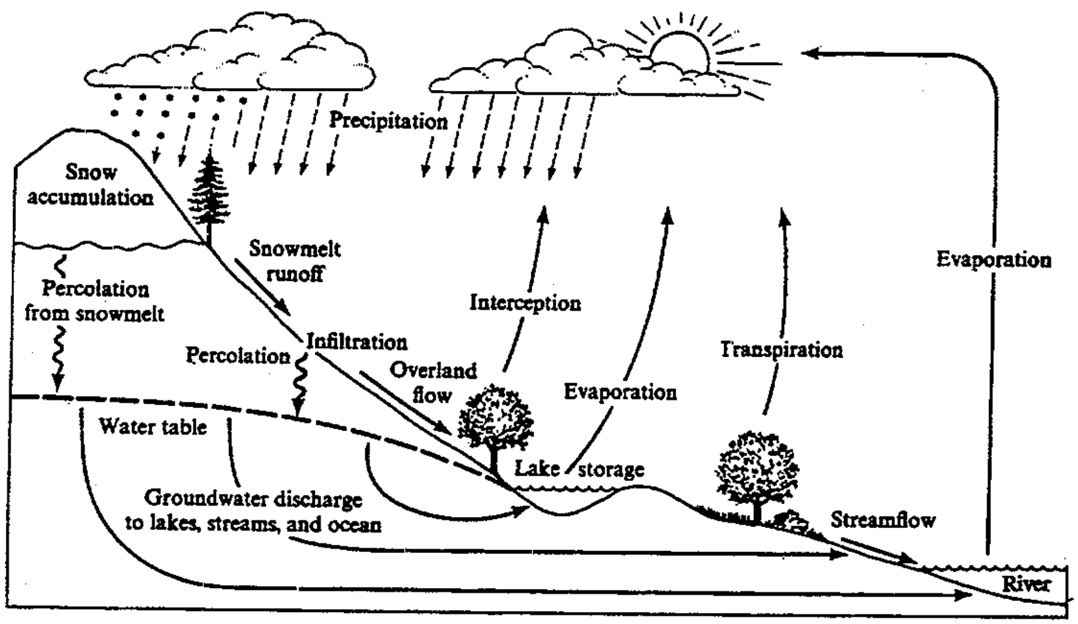


TOTAL ANNUAL PRECIPITATION (--- data not collected for that year) **AVERAGE MONTHLY PRECIPITATION**

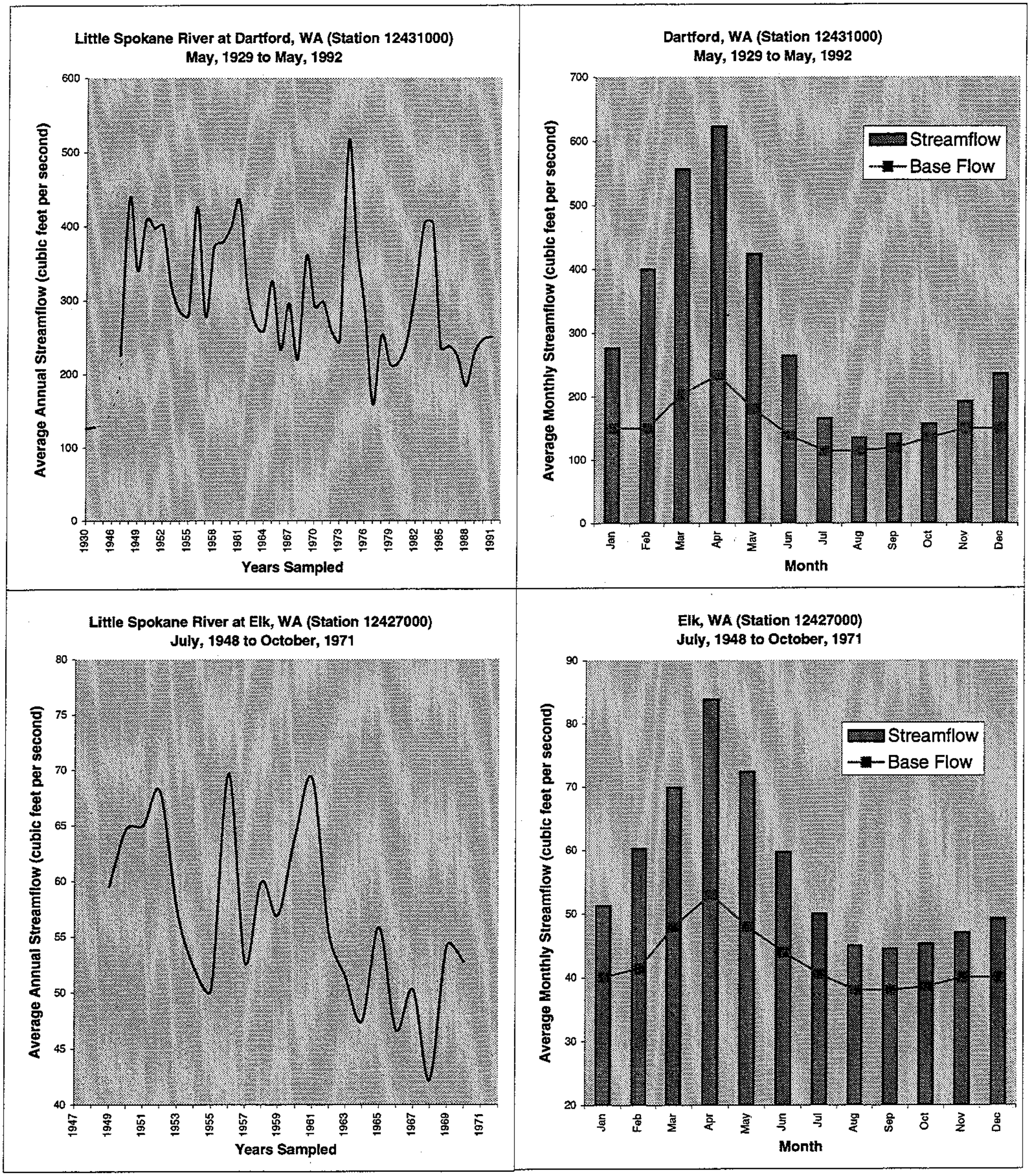
Figure 1. Total Annual and Average Monthly Precipitation at Three Stations Located in the Little Spokane River Watershed.

DAMES & MOORE

FINAL.XLS/Little Spokane
2/28/95 - 9:58 AM



SCHEMATIC DIAGRAM OF HYDROLOGIC CYCLE



Average Annual Streamflow (--- data not collected for that year)

Average Monthly Streamflow

Figure 3. Average Annual and Monthly Streamflow at Two Stations Located in the Little Spokane River Watershed.

DAMES & MOORE

FINAL XLS/Little Spokane
2/28/95 - 10:04 AM

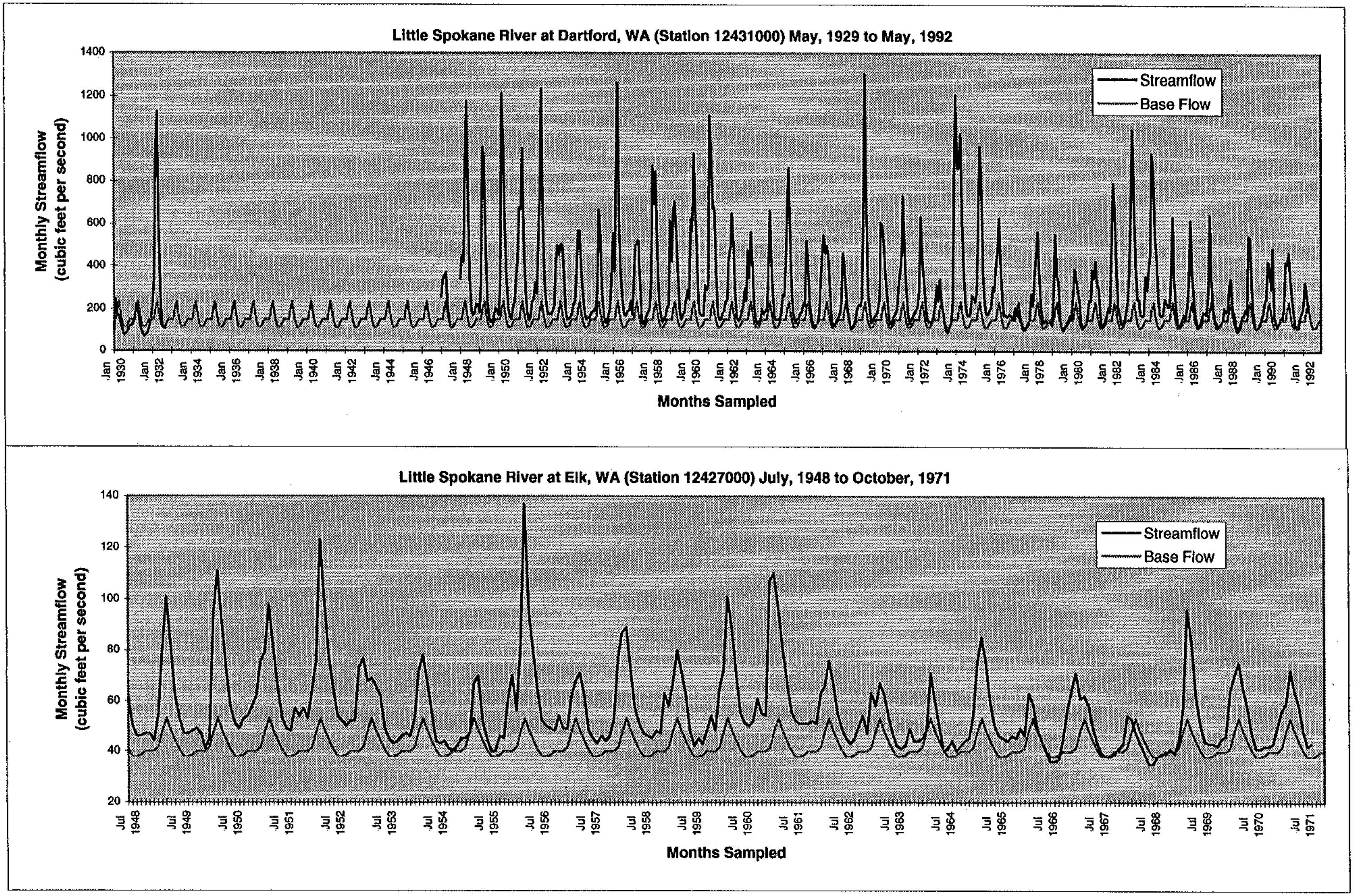


Figure 4. Streamflow, by Month, at Two Stations Located in the Little Spokane River Watershed.

DAMES & MOORE

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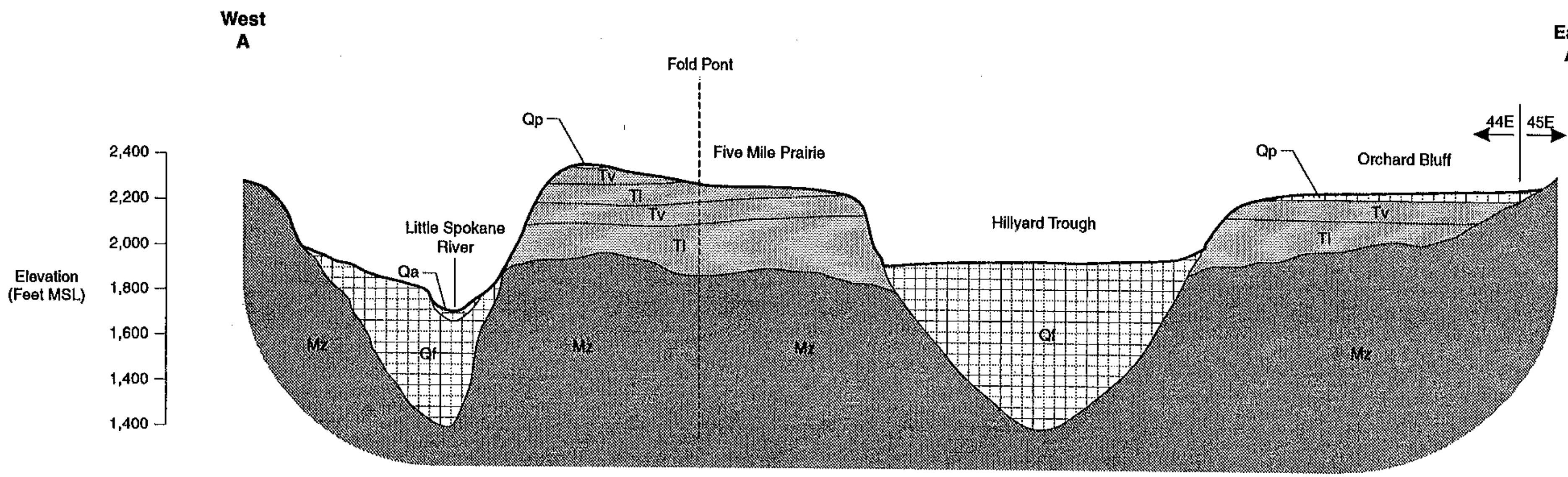
07927_05.CDR



LEGEND

Q		Quaternary overburden
	Qa	Alluvium
	Qf	Flood deposits
	Qp	Palouse Formation
Tv		Miocene Columbia River basalts
	Tl	Latah Formation
Mz		Mesozoic and older metamorphic rocks and intrusions

0 4 8
Scale in Miles

LITTLE SPOKANE WRIA
GENERALIZED GEOLOGIC CROSS-SECTION

Job No. 07927-010-005
DAMES & MOORE

Watershed Assessment
Washington Department of Ecology
FIGURE 5

Figure 6. WRIA 55 - Little Spokane River Watershed

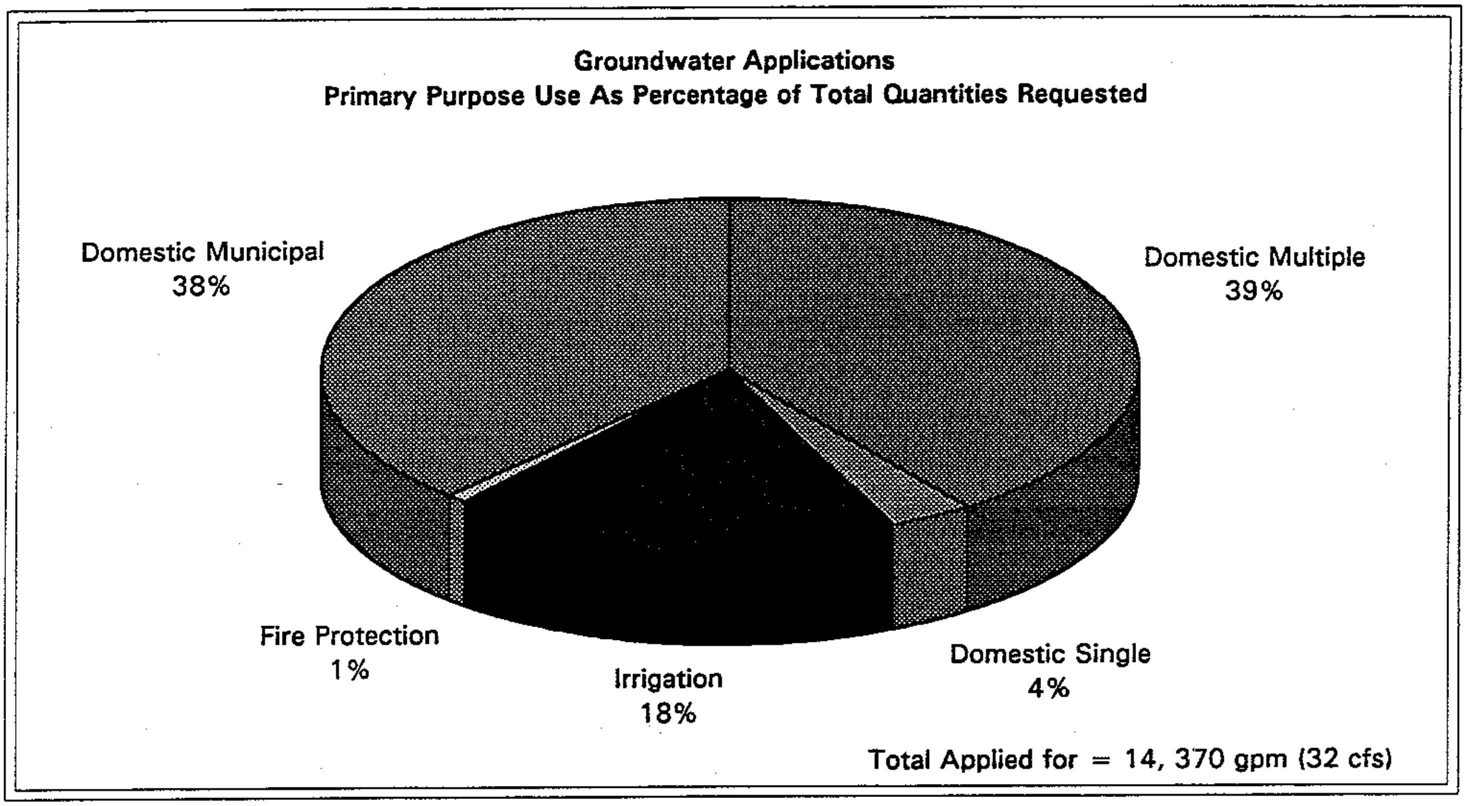


Figure 7. WRIA 55 - Little Spokane River Watershed

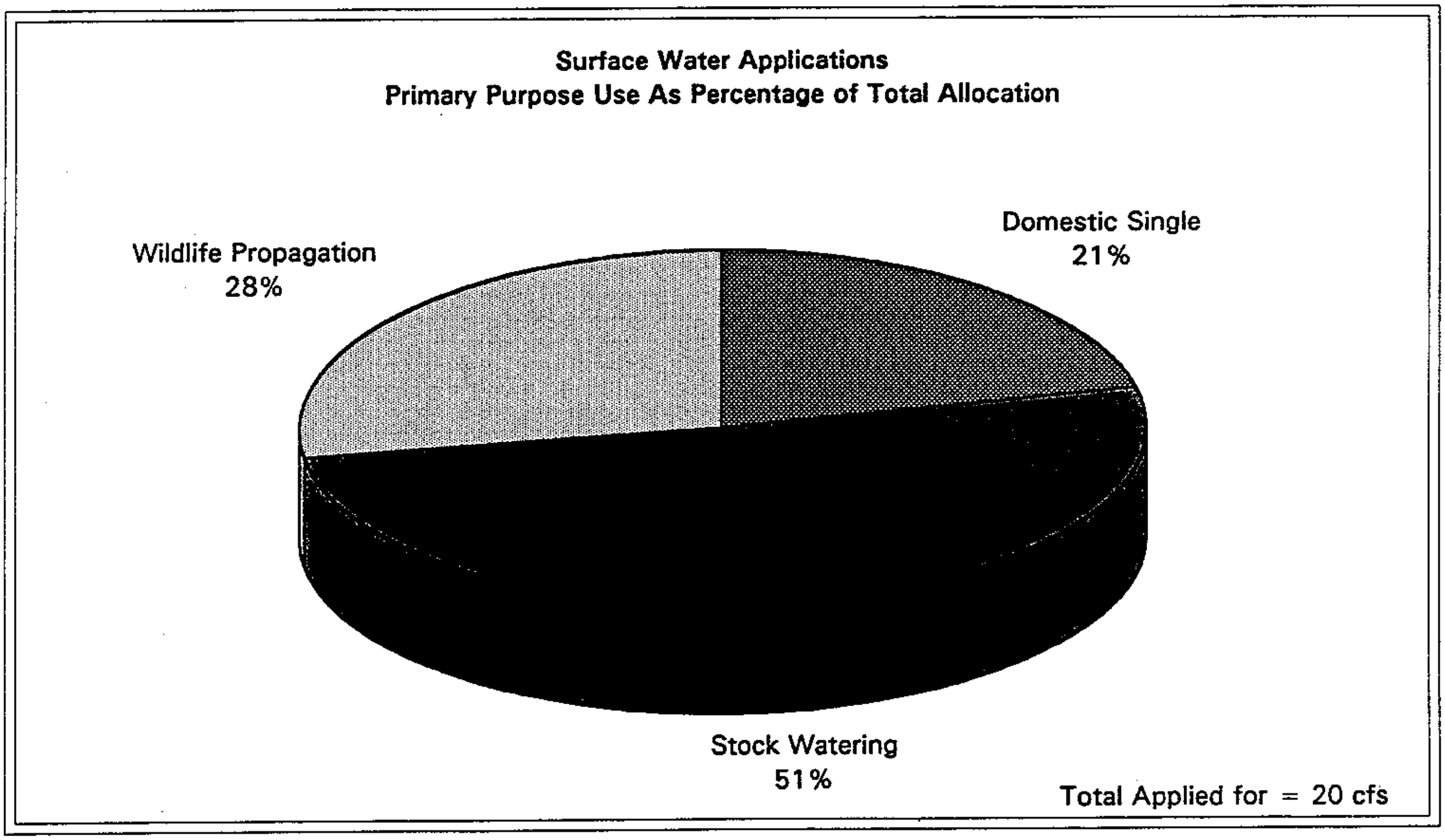


Figure 8. WRIA 55 - Little Spokane River Watershed.

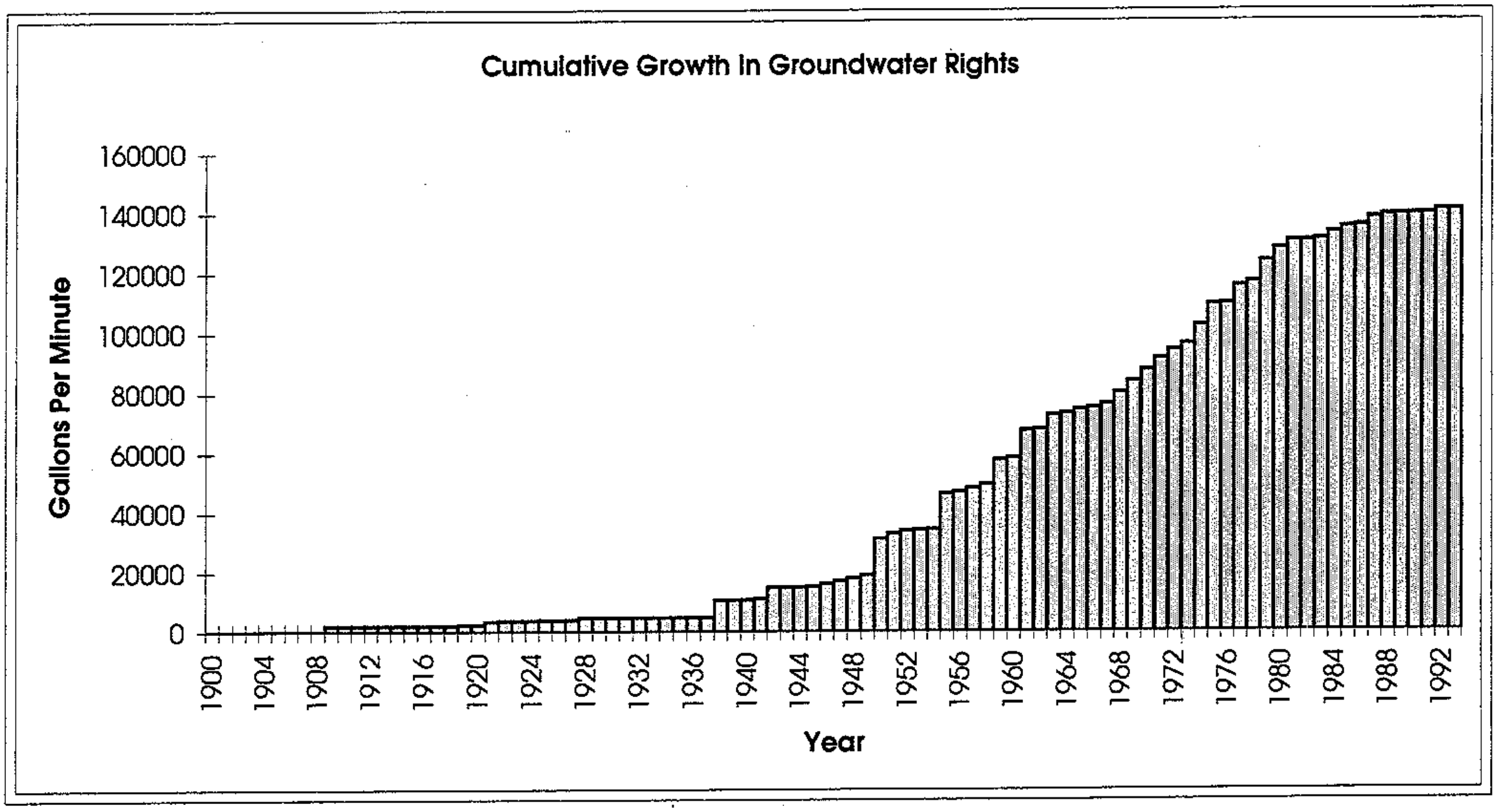


Figure 9. WRIA 55 - Little Spokane River Watershed.

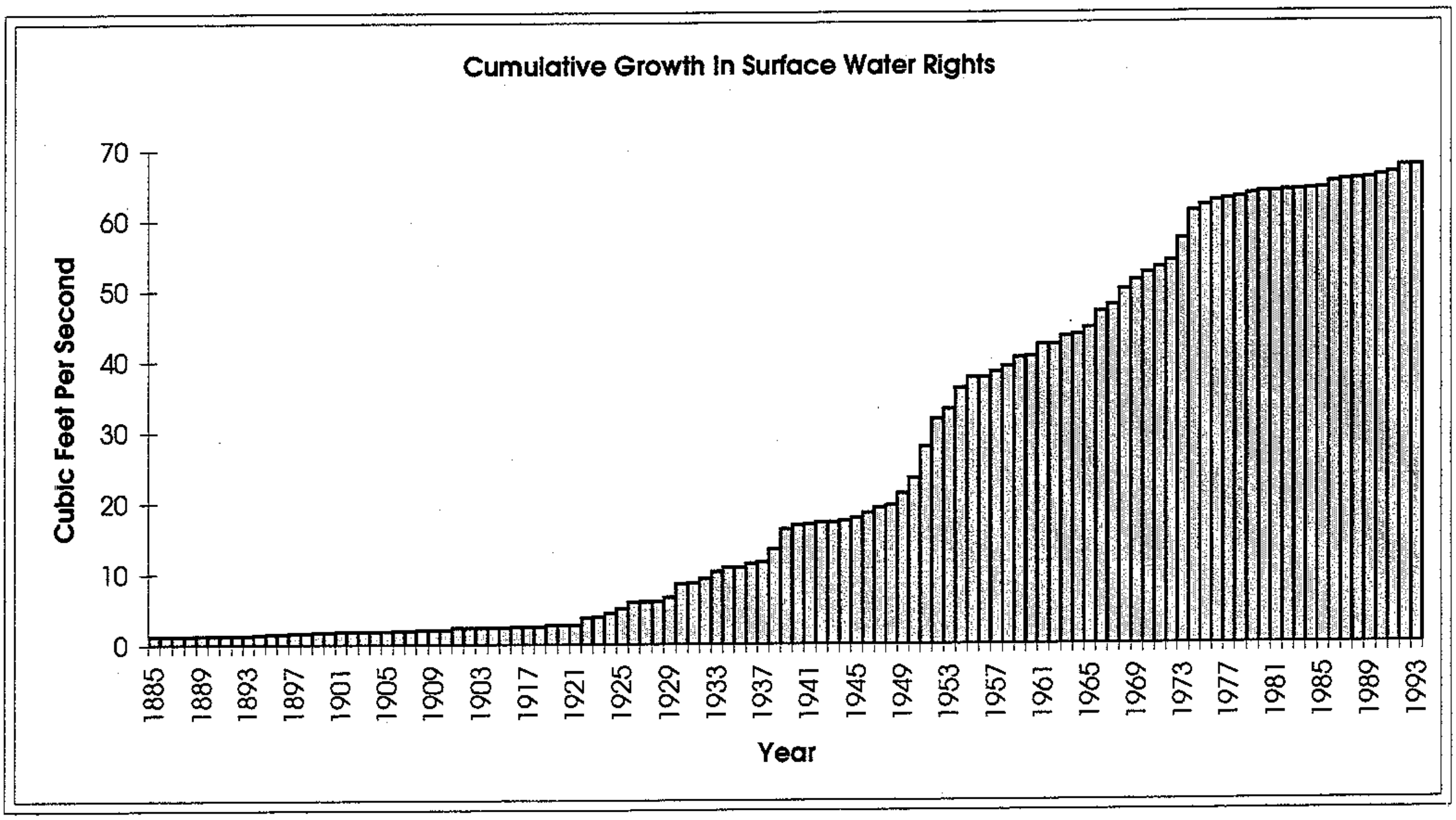
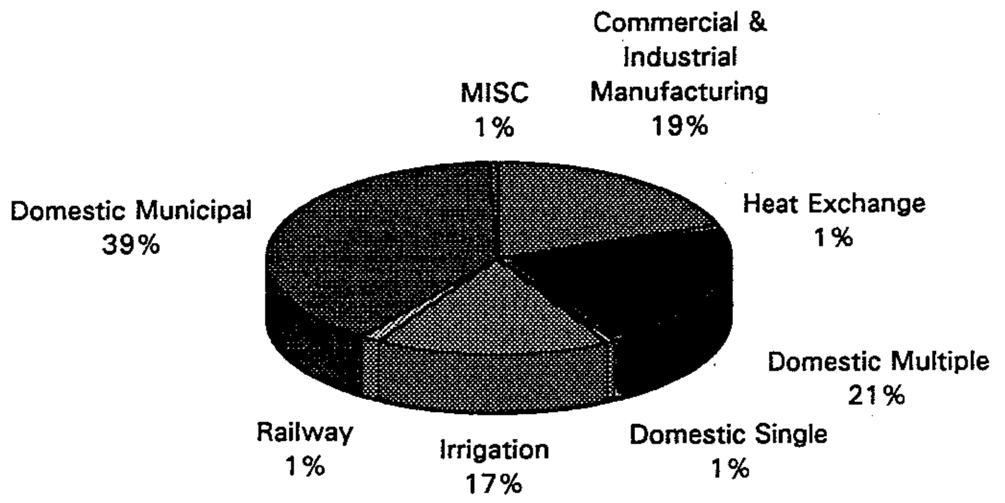


Figure 10. WRIA 55 - Little Spokane River Watershed.

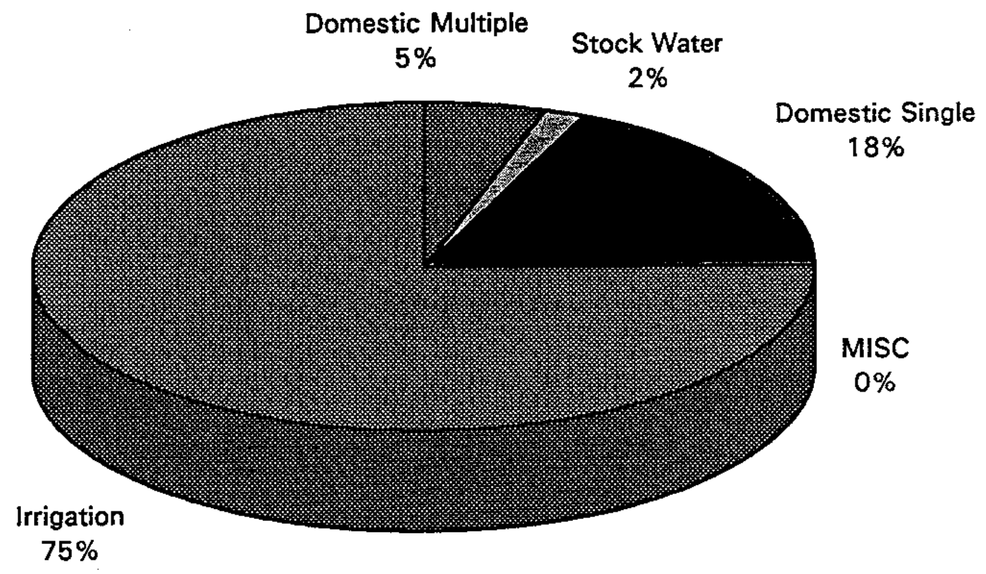
Groundwater Rights (Permits and Certificates)
Primary Purpose Use As Percentage of Total Allocation



Total Allocation = 106,587 acre-ft/year

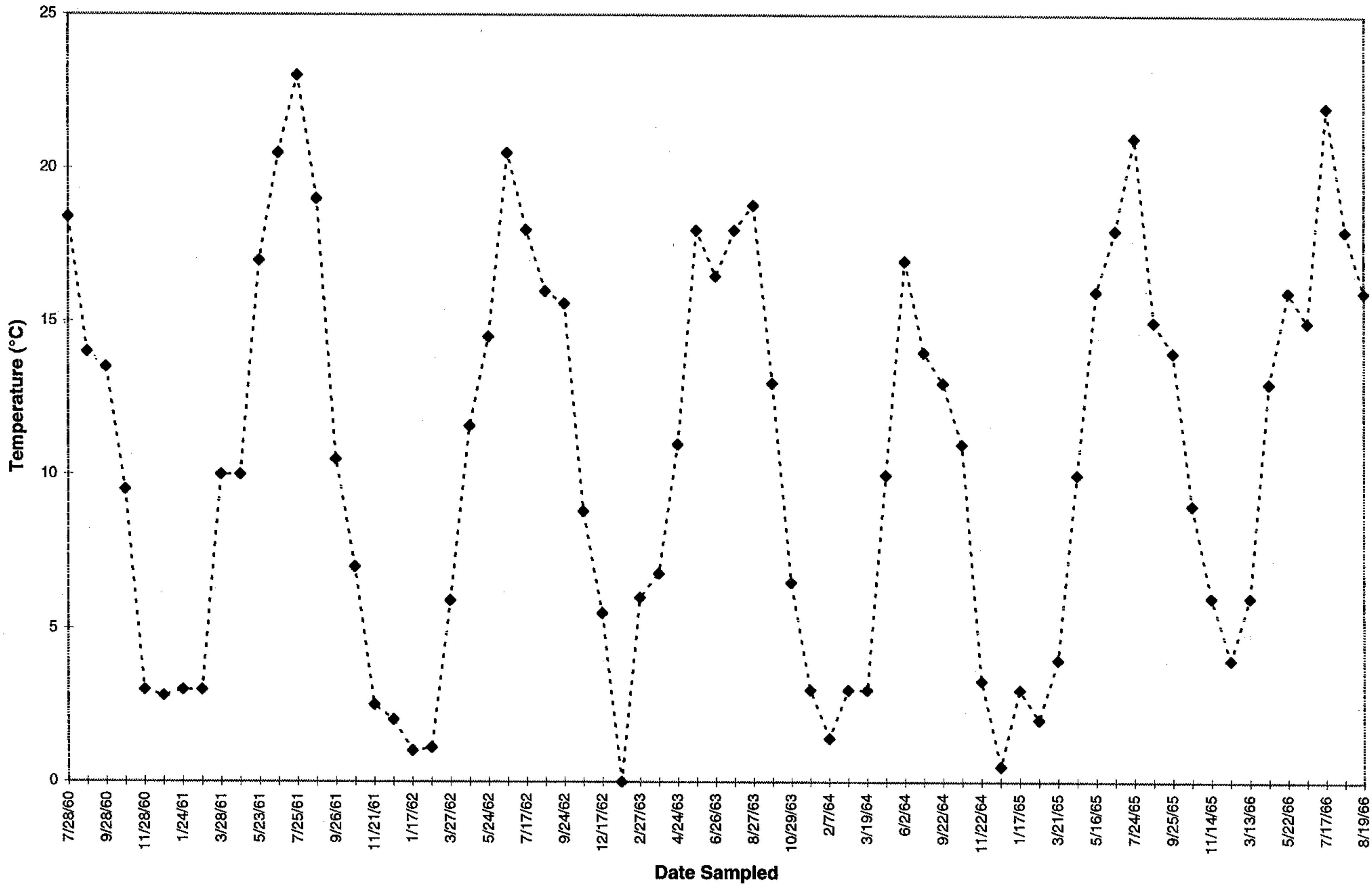
Figure 11. WRIA 55 - Little Spokane River Watershed.

Surface Water Rights (Permits and Certificates)
Primary Purpose Use As Percentage of Total Allocation



Total Allocation = 7,812 acre-ft/year

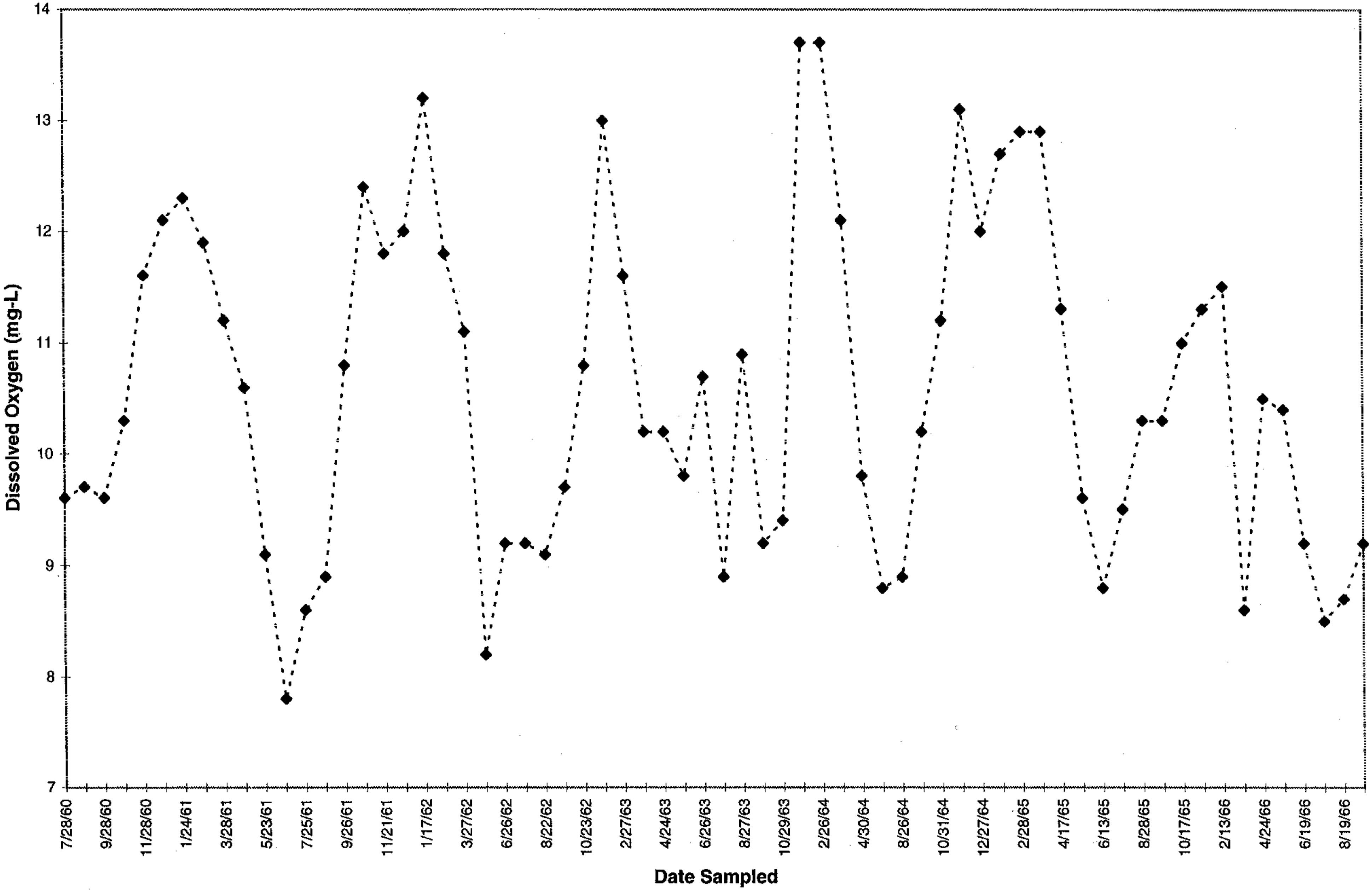
Figure 12. Little Spokane River Temperature Values (°C) at a Station at Dartford, WA for the Years 1960 through 1966.



DAMES & MOORE

SPOKANE1.XLS/Temp Chart F
2/28/95 - 9:41 AM

Figure 13. Little Spokane River Dissolved Oxygen Values (Milligrams per Liter) at a Station at Dartford, WA for the Years 1960 through 1966.



DAMES & MOORE

SPOKANE1.XLS/DO (mg-L) Chart F
5/10/95 - 9:33 AM

Appendix A.1 Department of Ecology Regional Precipitation Analysis (Barker 1995)

LONG TERM PRECIPITATION TRENDS

Introduction

Precipitation data from gages located throughout the state were used to examine long term trends and identify extended periods of above or below average precipitation. This analysis will put the more recent weather patterns that we have experienced into a long-term perspective. Such a perspective is necessary when considering the issuance of additional water rights because periods of extended drought identified in the historical record can be expected to occur again in the future.

Precipitation Stations

Precipitation stations located at 16 sites throughout the state were used for the analysis (Figure 1). The criteria used to select a particular station was that the record should be relatively long (80 or more years), have few periods of missing data, and be geographically disperse from the other stations. Periods of missing data were filled in using nearby stations if available, or at-station monthly mean values if a secondary station was not available. Table 1 shows the stations used in the analysis. Stations 1 through 8 are in western Washington, stations 9 through 16 are in eastern Washington.

Table 1
Long Term Precipitation Stations Used in Analysis

Name	County	Period of Record	Mean Annual Precipitation (inches)
1. Port Angeles	Clallam	1878-1992	25.5
2. Olympia	Thurston	1878-1992	51.6
3. Vancouver	Clark	1899-1992	38.7
4. Sedro Woolley	Skagit	1897-1992	45.9
5. Cedar Lake	King	1903-1992	102.7
6. Seattle	King	1878-1992	35.5
7. Aberdeen	Grays Harbor	1891-1992	82.5
8. Centralia	Lewis	1892-1992	45.6
9. Lake Kachess	Kittitas	1909-1974	51.4
10. Wenatchee	Chelan	1913-1992	8.8
11. Yakima	Yakima	1910-1992	7.6
12. Omak	Okanogan	1909-1989	11.6
13. Odessa	Lincoln	1903-1992	10.0
14. Colville	Stevens	1898-1986	17.5
15. Spokane	Spokane	1881-1992	16.3
16. Walla Walla	Walla Walla	1873-1992	16.7

Results
The deviation of the annual precipitation total from the mean for each station is shown in Figures 2A-2H and 3A-3H. The trend line on each graph is a moving average of the previous 10 years.

For presentation purposes, the gages were grouped into two broad categories; those located west of the cascade divide and those located east of the divide. The data for each station was normalized by dividing the annual deviation from the mean by the at-site mean annual precipitation. The normalized data for each group was then averaged to obtain a trend line for each region (Figures 4 and 5).

In western Washington, high variability can be seen throughout the period of record. Since the mid-1950's, the precipitation has been typically above the long-term mean. Extended periods of below average precipitation occurred in the 1920's and 1930's and again in the late 1940's.

In eastern Washington, precipitation was generally above the long-term average since the 1940's except for a period in the mid 1970's. An extended period of below average precipitation occurred in the 1920's through about 1940.

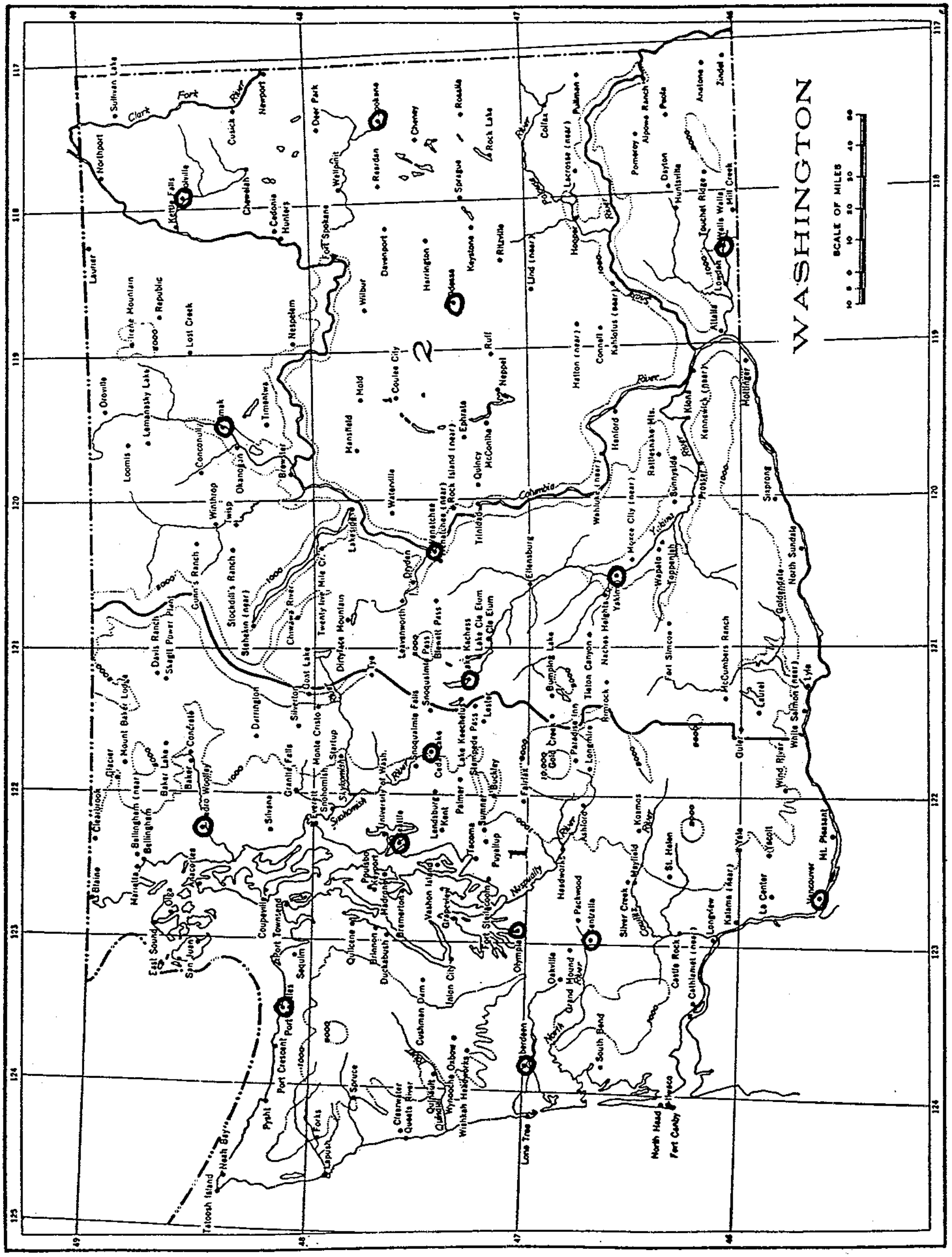


Figure 1. Station Locations

U. S. GOVERNMENT PRINTING OFFICE: 1936

For sale by the Superintendent of Documents, Washington, D. C. - - Price 10 cents

Figure 2A

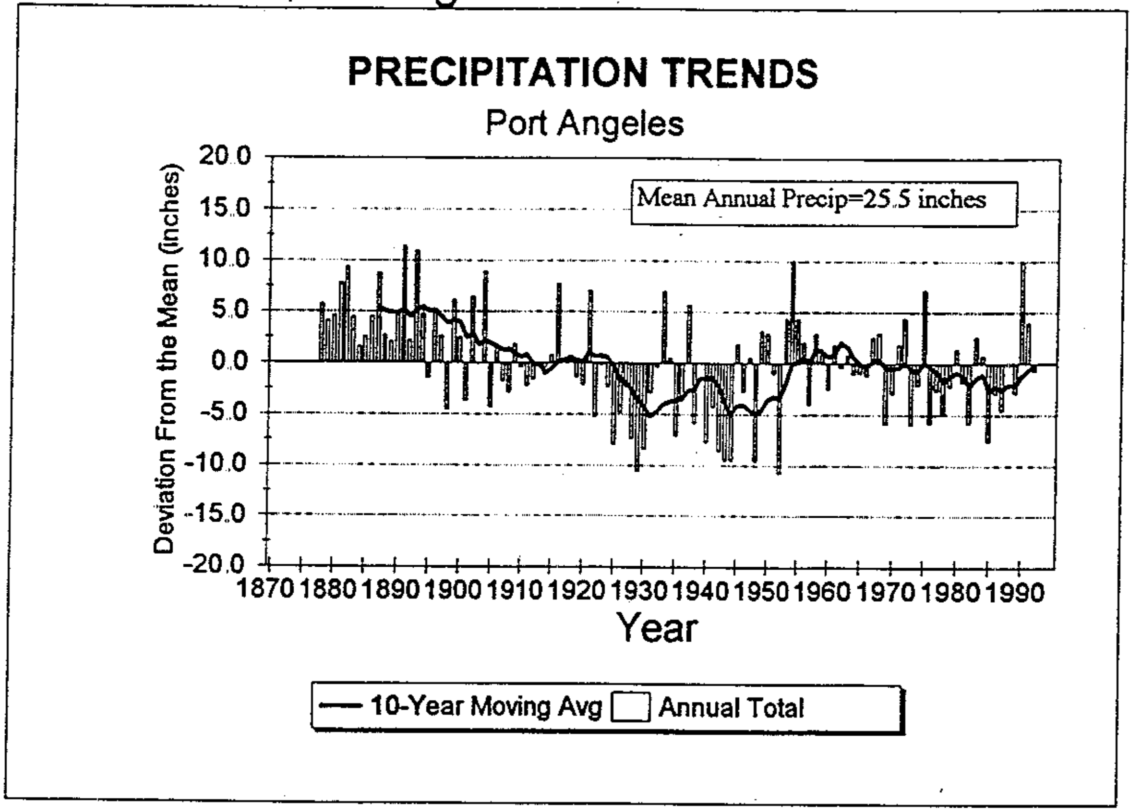


Figure 2B

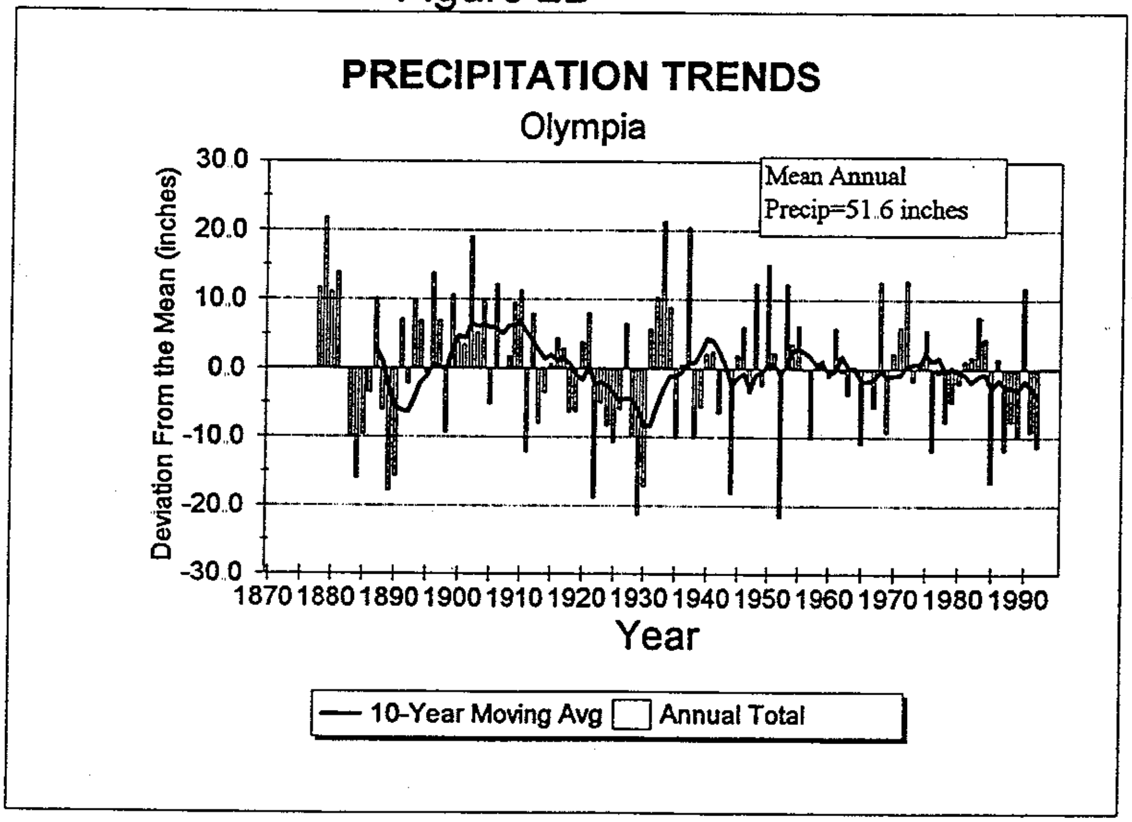


Figure 2C

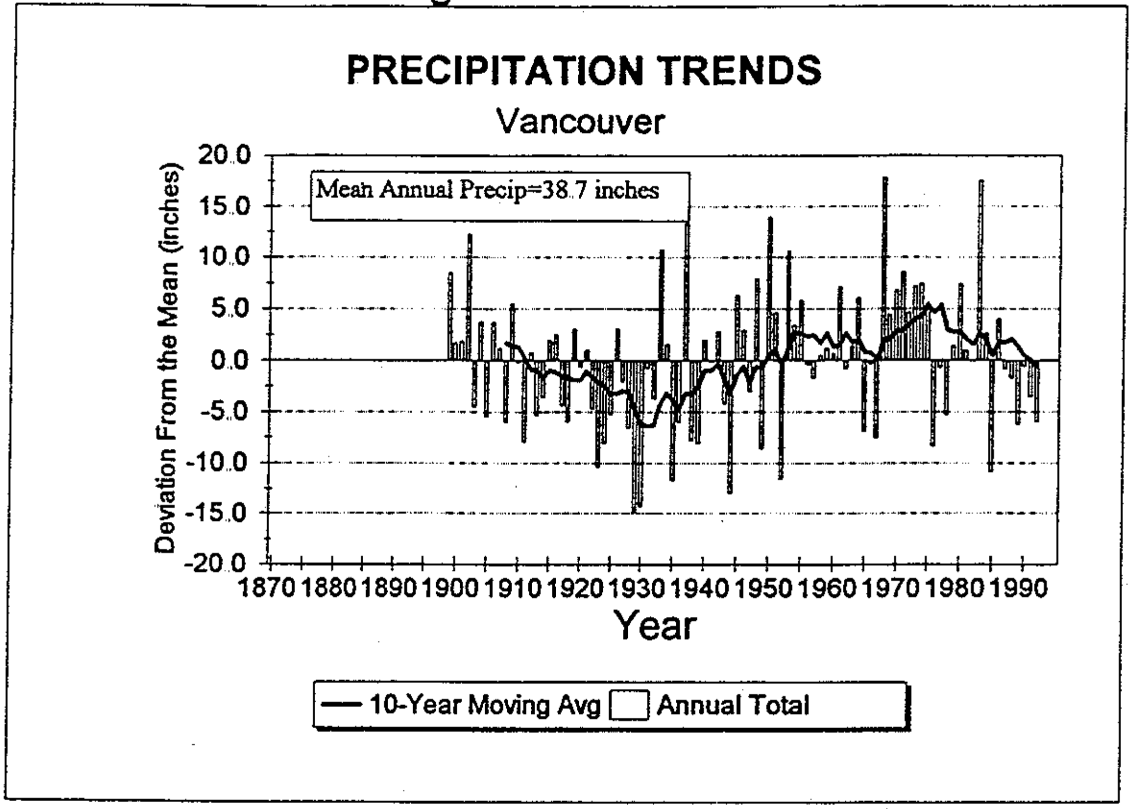


Figure 2D

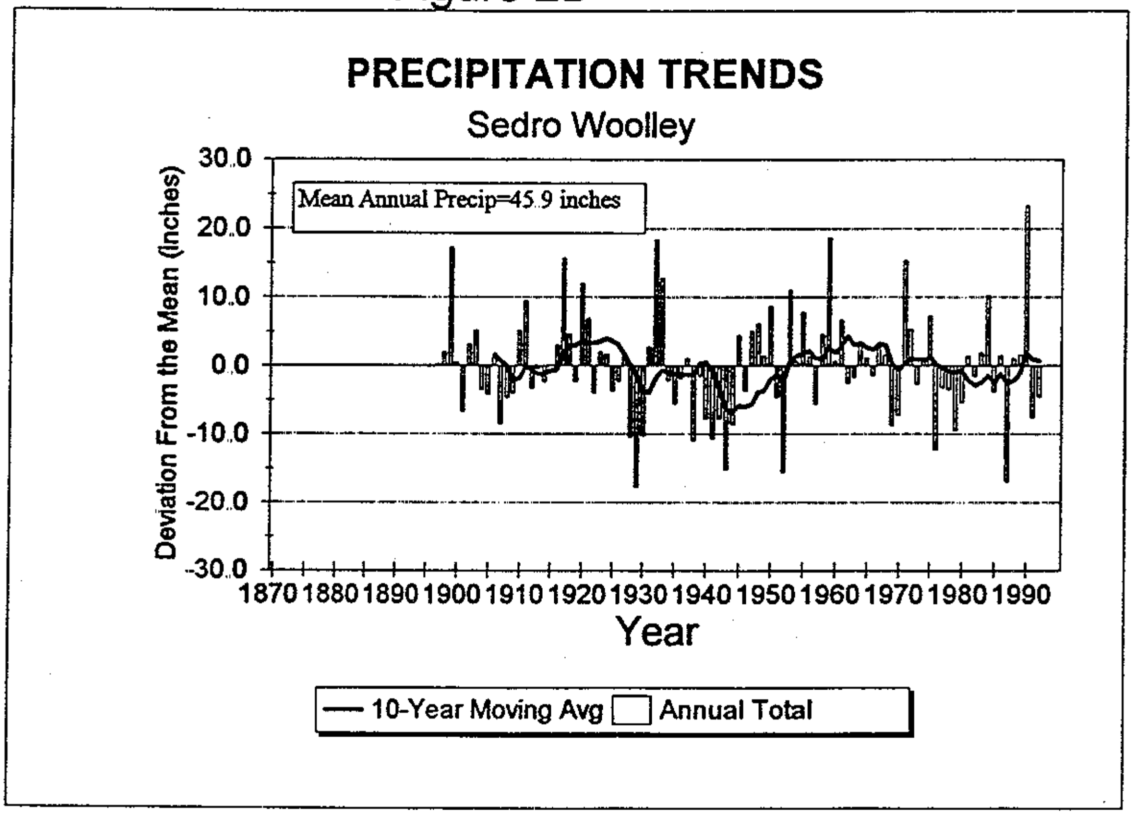


Figure 2E

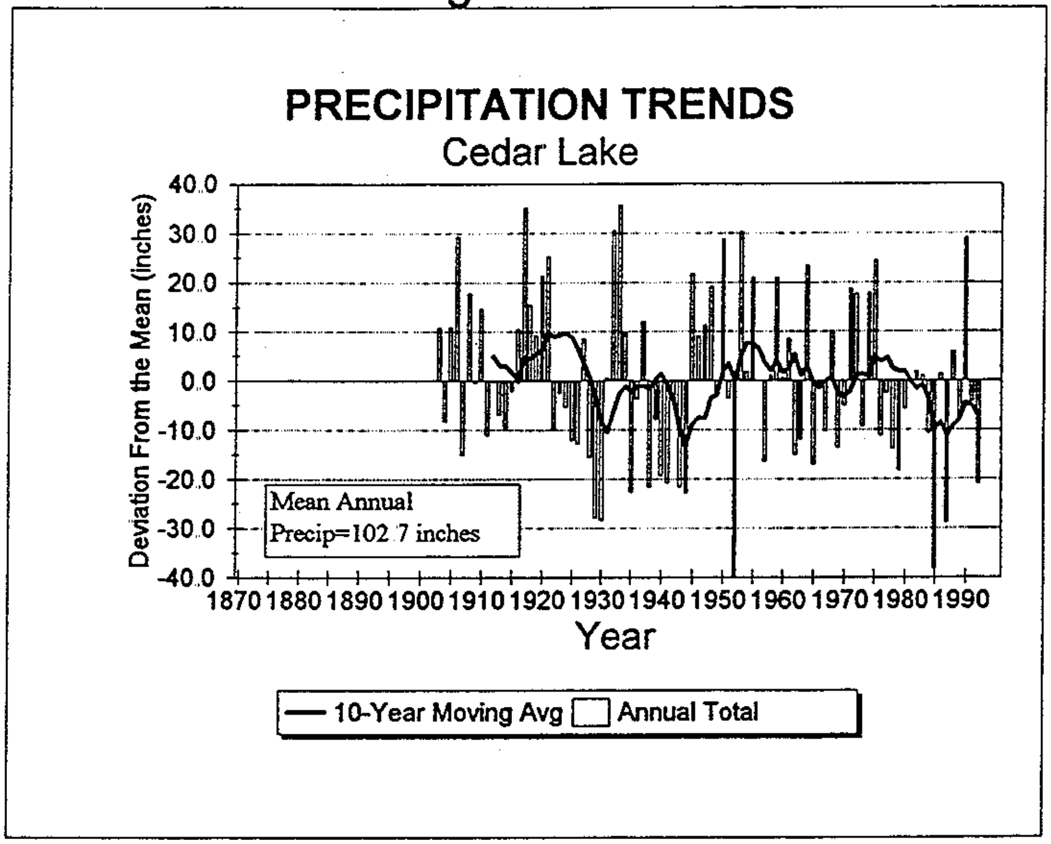


Figure 2F

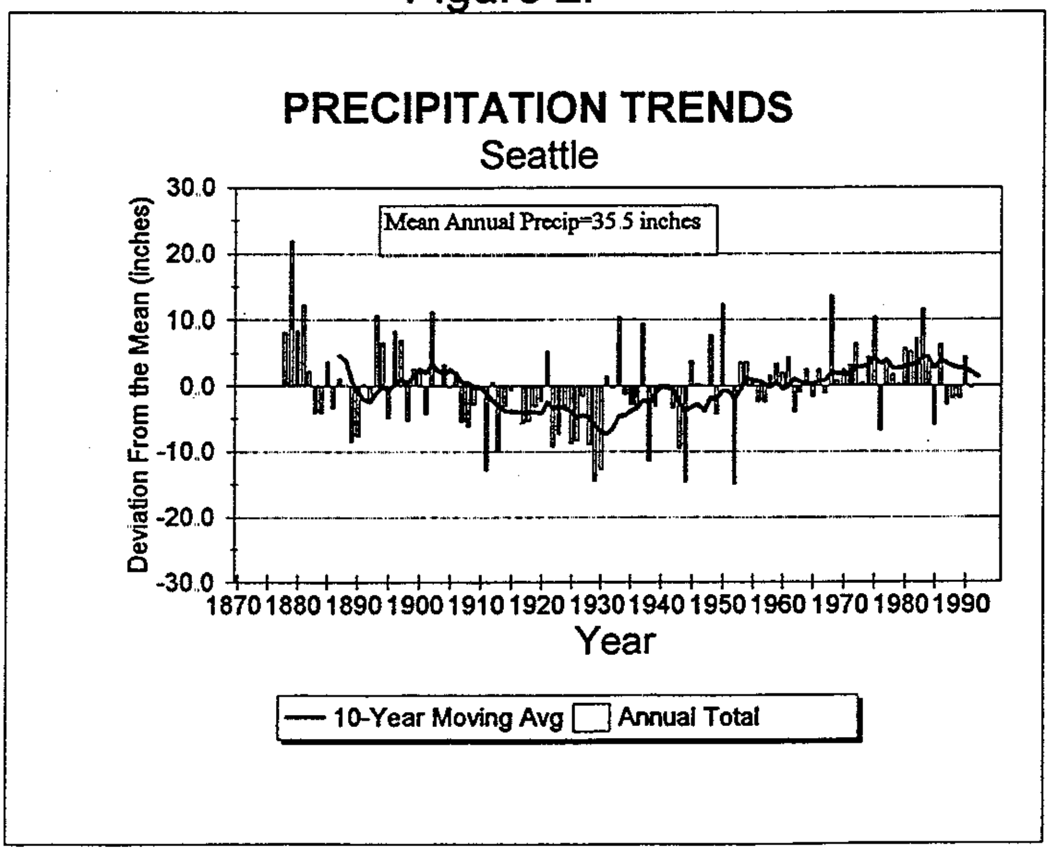


Figure 2G

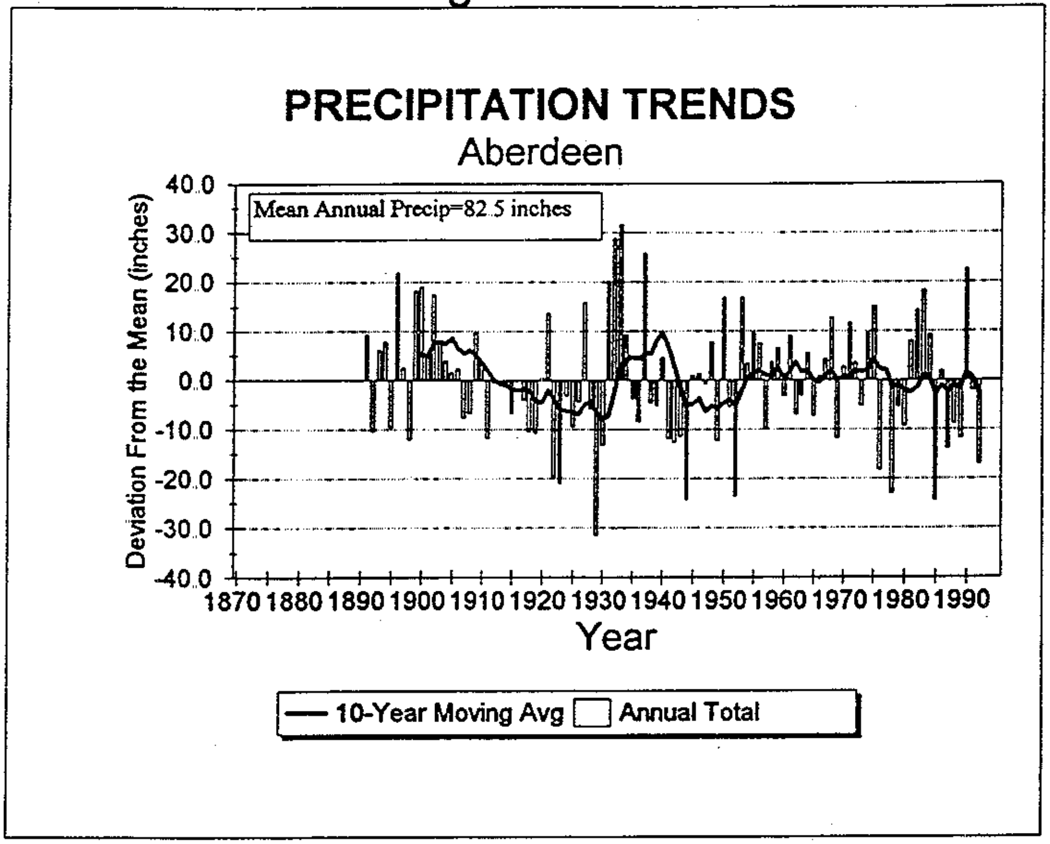


Figure 2H

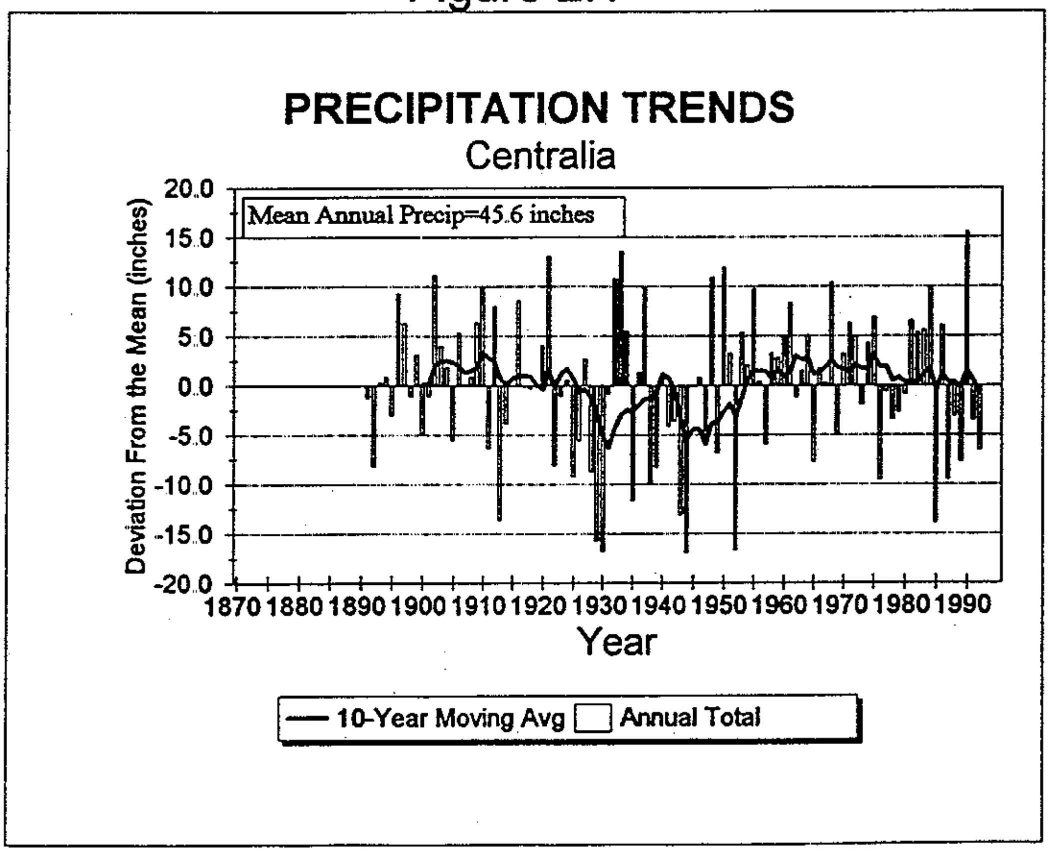


Figure 3A

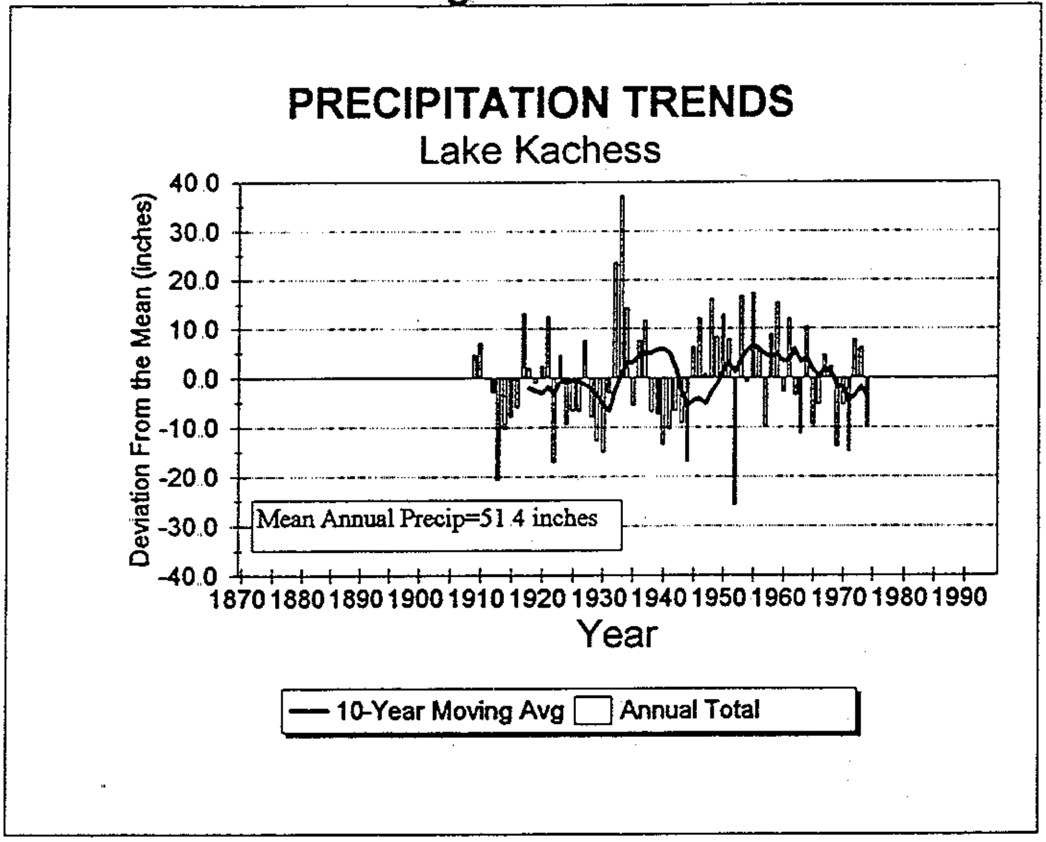


Figure 3B

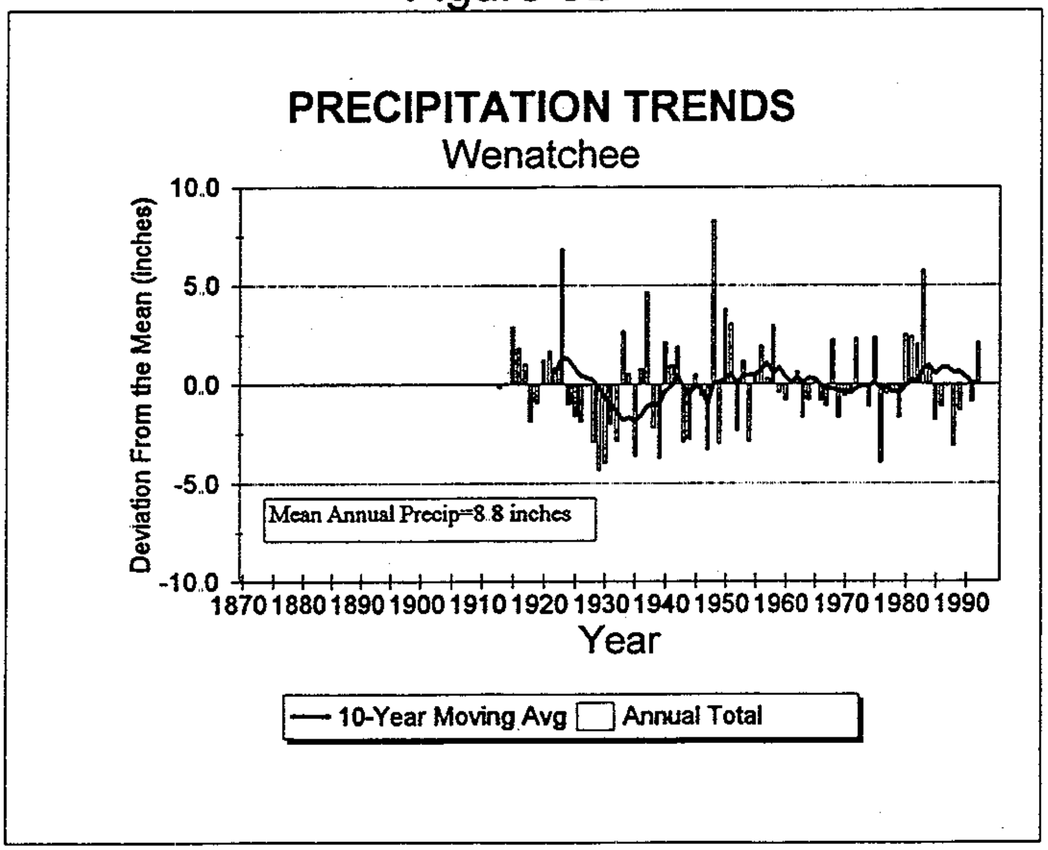


Figure 3C

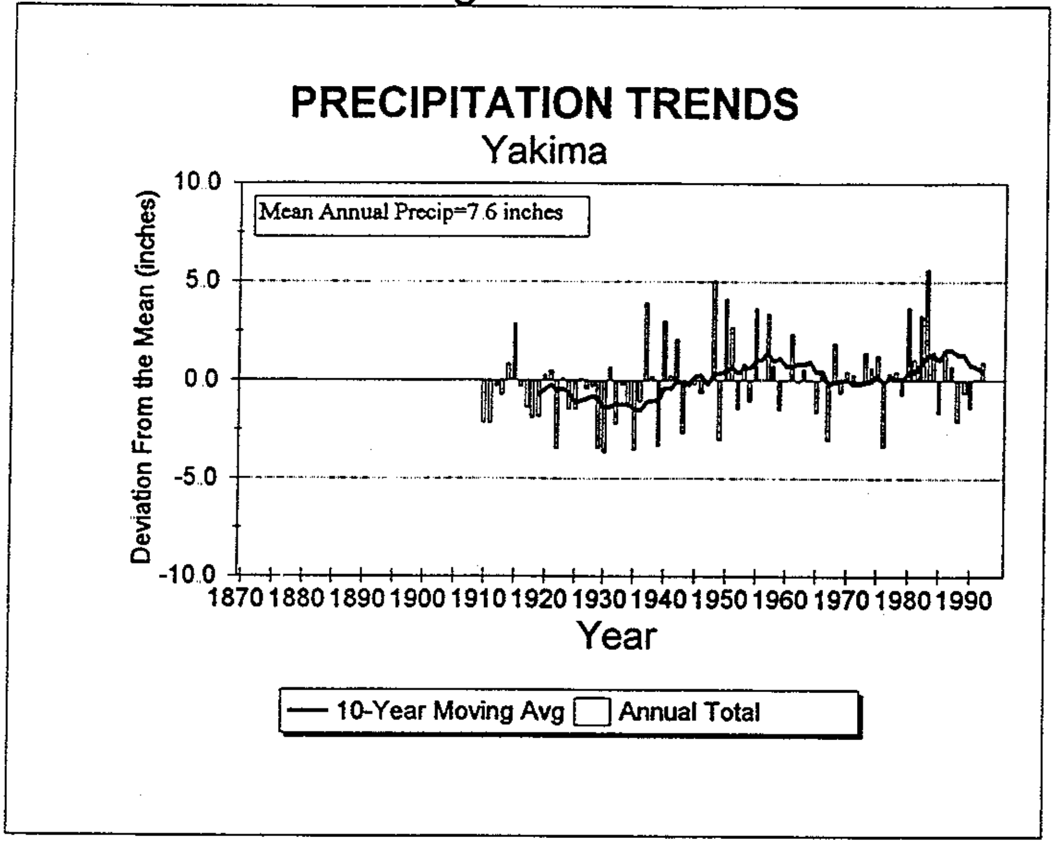


Figure 3D

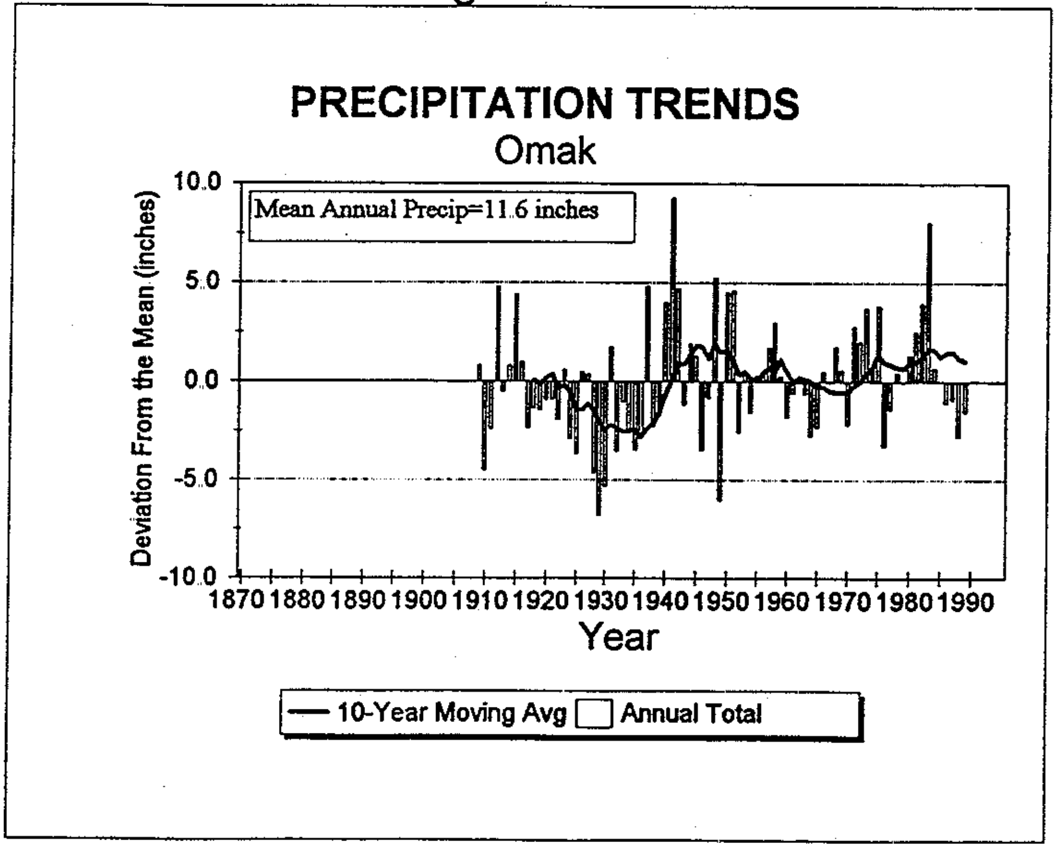


Figure 3E

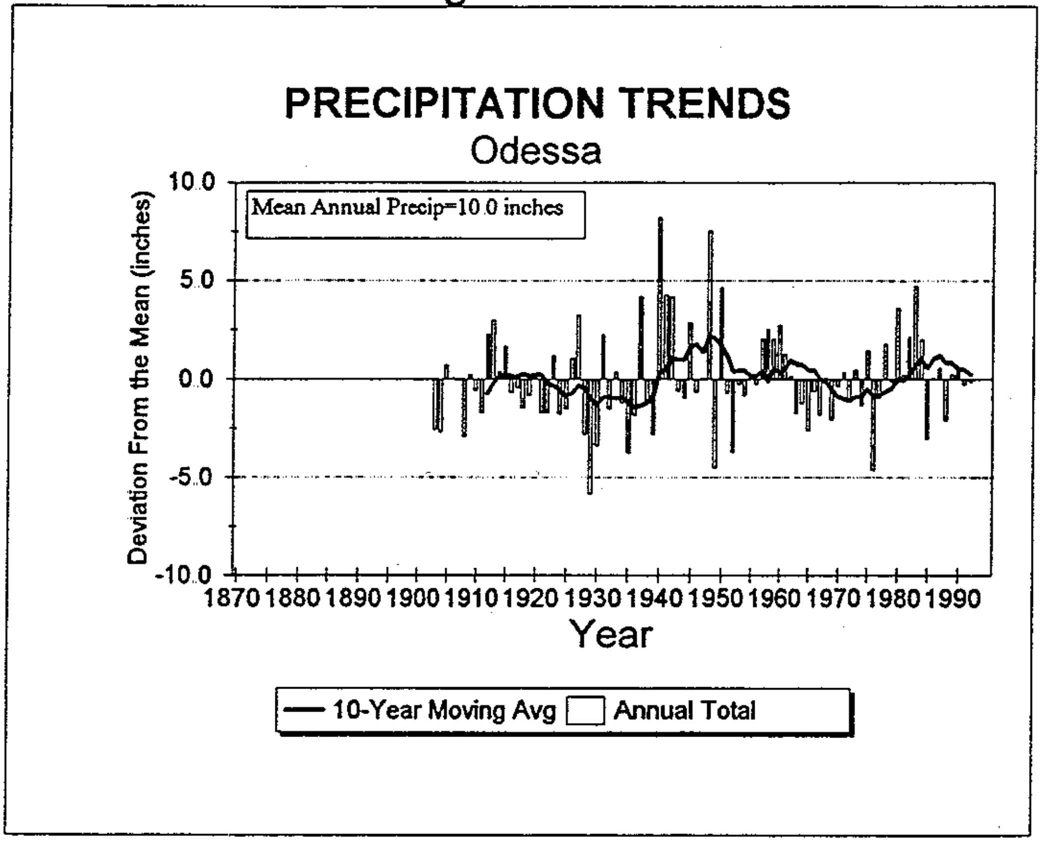


Figure 3F

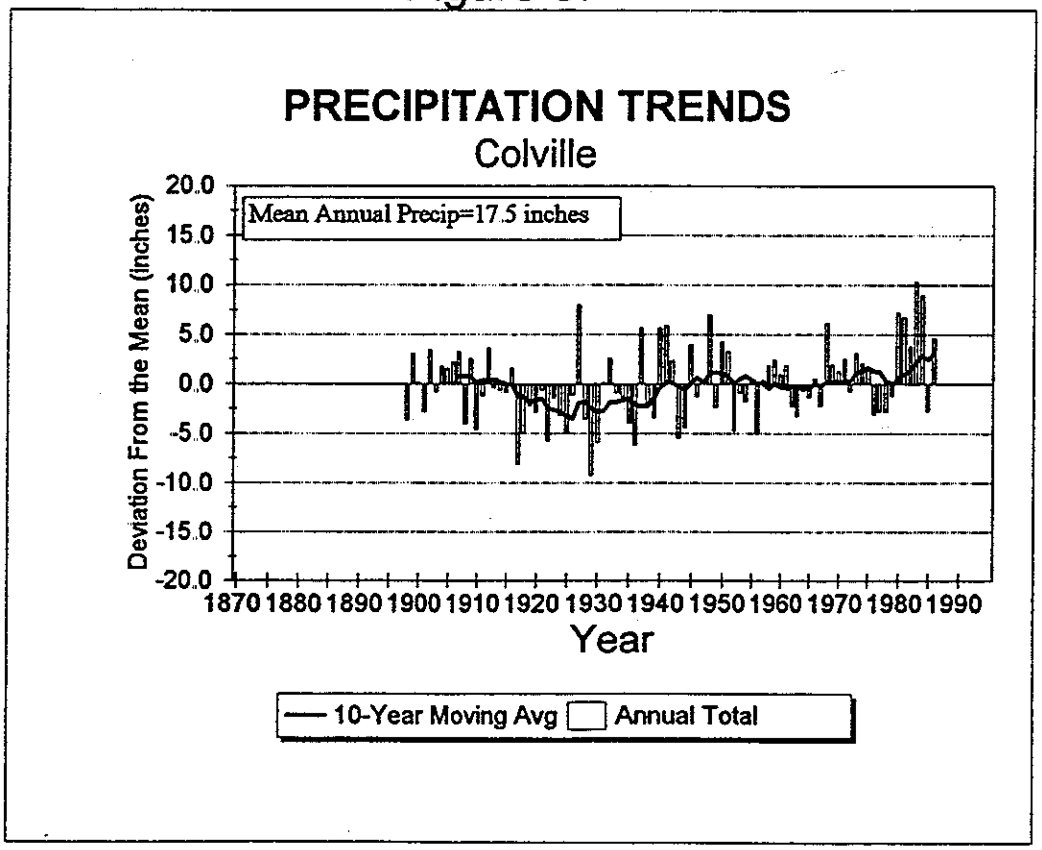


Figure 3G

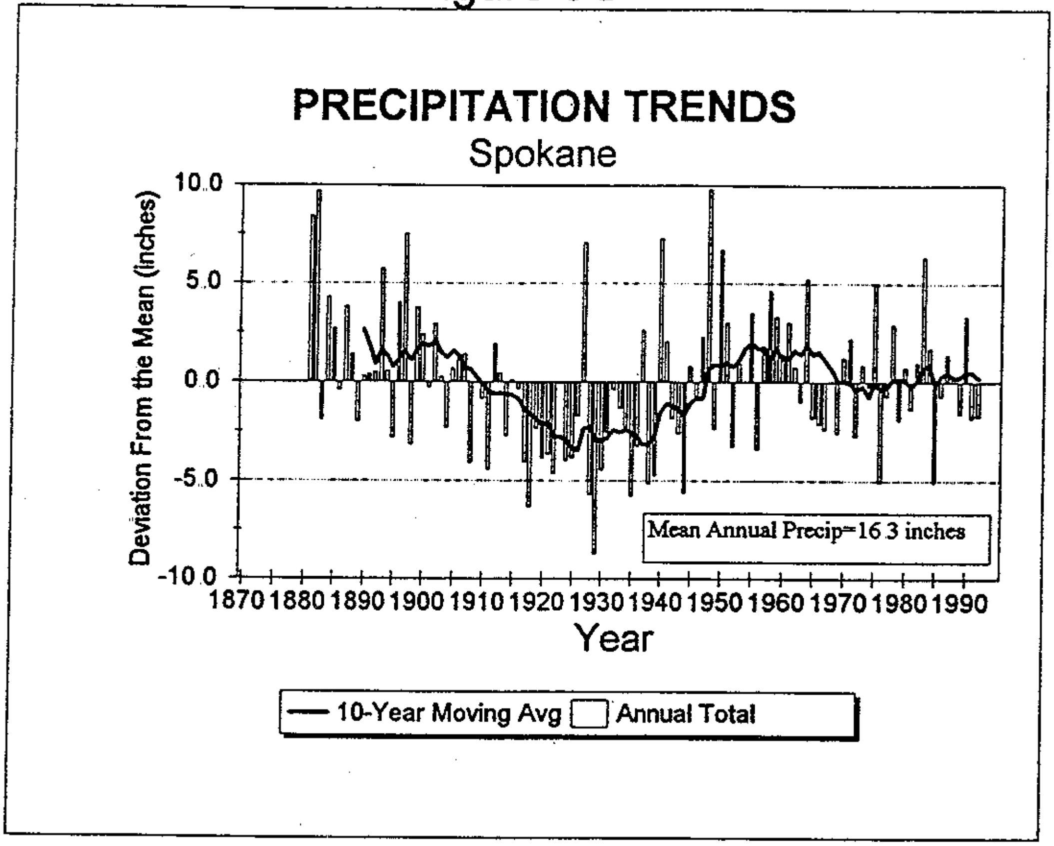


Figure 3H

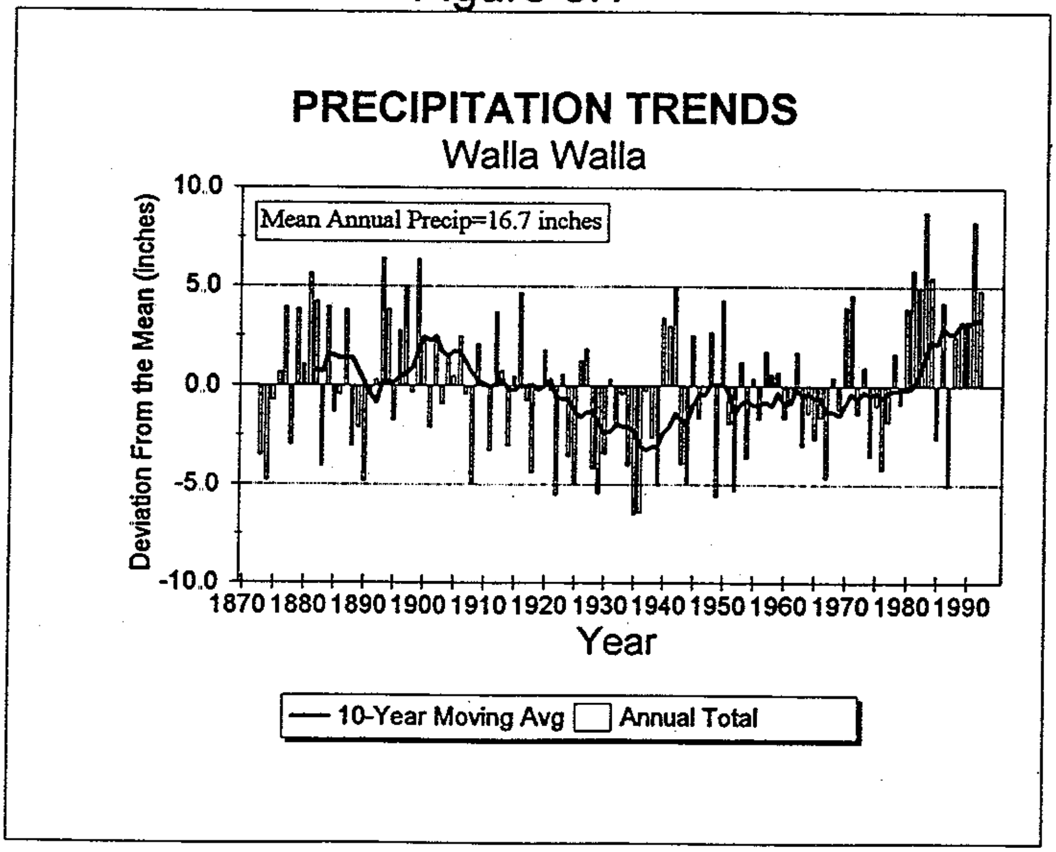


Figure 4

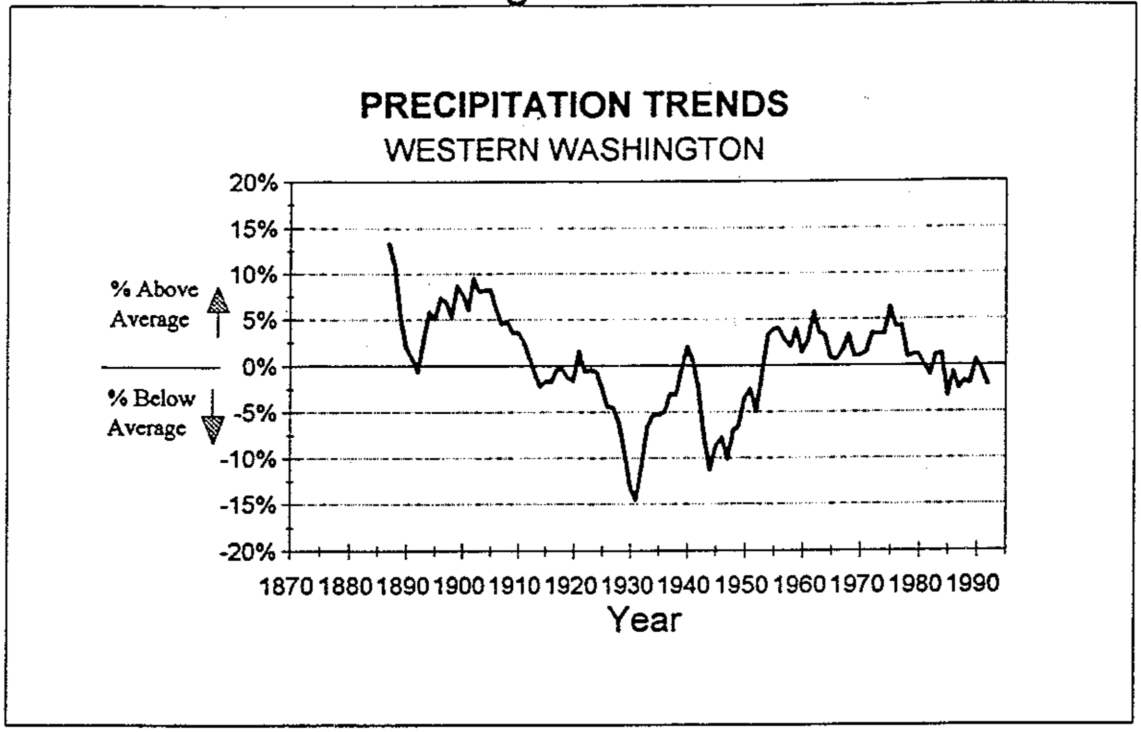
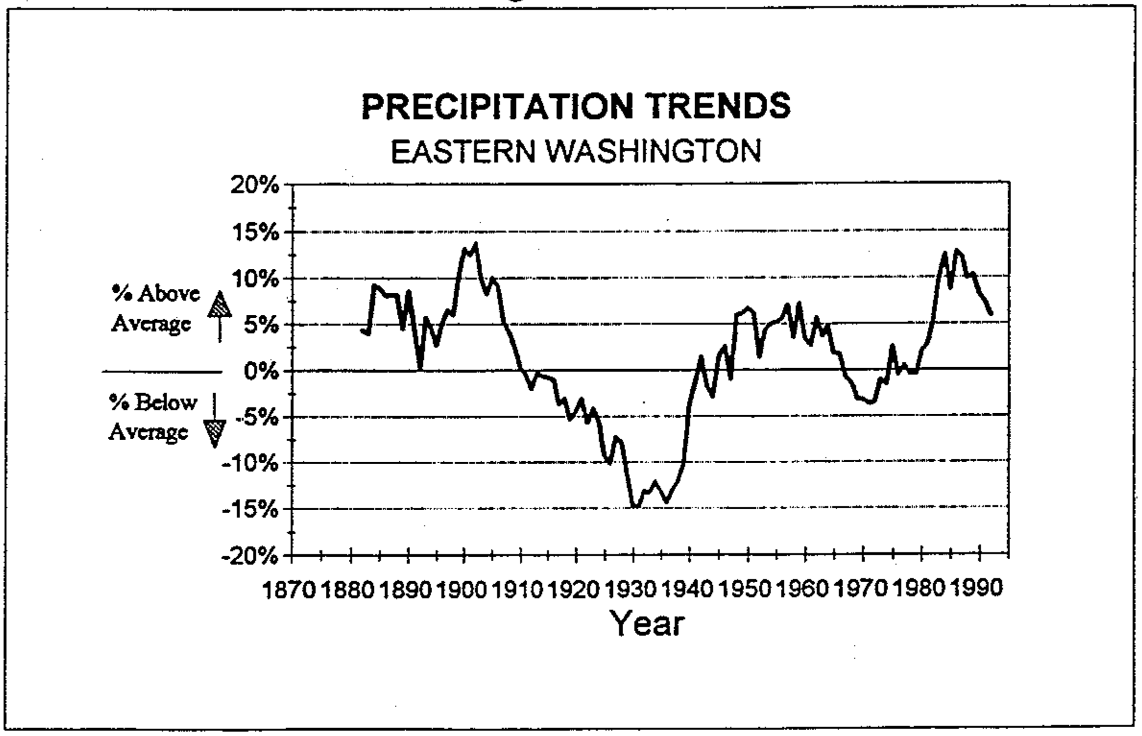


Figure 5



Appendix A.2 Precipitation and Streamflow Trend Analysis Results

Appendix A.2

This appendix presents a summary of the statistical analyses performed on the annual precipitation data for the period of record at each station. The data sheets show the resultant best fit equation in the form:

$$y = mx + b$$

where y = predicted annual precipitation

m = slope of trend line (positive is increasing over time and negative is decreasing overtime)

x = sequential time (as the predictor variable)

b = the predicted y value at zero time (start of the record)

The years of no record were deleted from the data sets before analysis. Also, analysis was conducted after normalizing on the mean value for each record. The normalized record allows comparison of the trend slope between stations without adjusting for absolute values of the data for each station. Trend comparisons between stations were conducted using the normalized data sets over identical years of record.

Data sheets for statistical analysis of streamflows are also summarized in Appendix A.2. The analyses were completed in the same manner as the precipitation analyses (see Appendix A.1).

Appendix A.2
Precipitation and Streamflow Trend Analysis Results
Little Spokane Watershed - WRIA 55

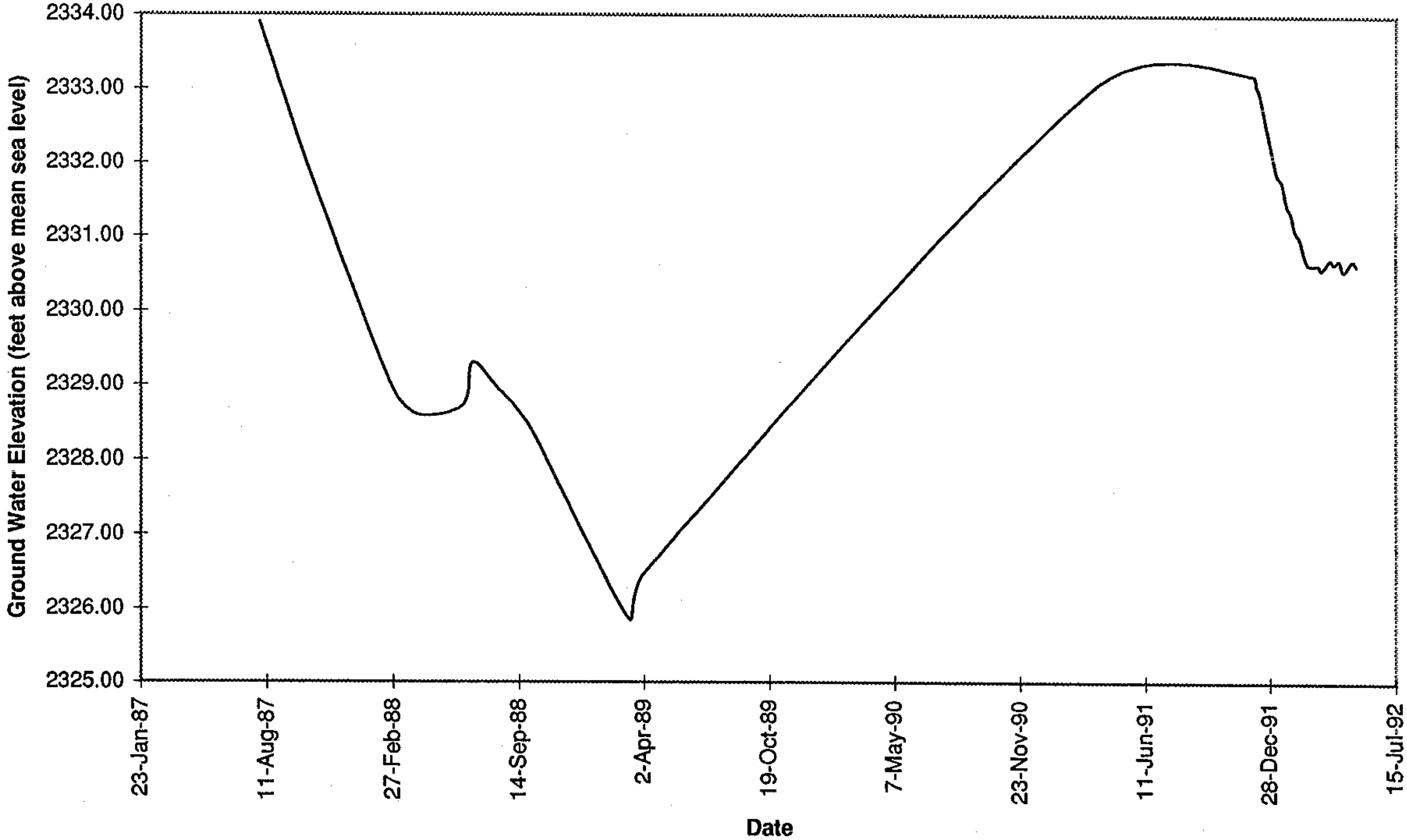
Analysis	Regression Equation	Normalized Regression Equation
Precipitation Analysis		
Annual Precipitation at Spokane (1948-1992)	precip = 18.2 - 0.0576 int	norm precip = 1.07 - 0.00339 int
Annual Precipitation at Spokane (1889 - 1992)	precip = 15.6 + 0.0076 int	norm precip = 0.976 + 0.000472 int
Linear Regression of Annual Precipitation Totals at Newport	precip = 25.3 + 0.0479 int	norm precip = 0.945 + 0.00179 int
Comparative Trend Analysis of Annual Precipitation Totals at Newport	precip = 29 6 - 0.810 int	norm precip = 1 04 - 0 00284 int
Comparative Trend Analysis of Annual Precipitation Totals at Colville	precip = 15.8 + 0.203 int	norm precip = 0.843 + 0.0108 int
Comparative Trend Analysis of Annual Precipitation Totals at Omak	precip = 11.7 + 0.0349 int	norm precip = 0.958 + 0 00286 int
Comparative Trend Analysis of Annual Precipitation Totals at Republic	precip = 16 6 - 0.0142 int	norm precip = 1.96 - 0.00049 int
Comparative Trend Analysis of Annual Precipitation Totals at Spokane	precip = 17 7 - 0.0689 int	norm precip = 1.06 - 0.00413 int
Streamflow Analysis		
Annual Average Streamflow of the Little Spokane River at Dartford (1948-1992)	flow = 379 - 3.18 int	norm flow = 1.23 - 0.0104 int

Key to Variables

precip = Annual total precipitation for the period of record
flow = Annual average flow for the period of record
int = Integer representing year number in numerical order from the start of the record
(i e. for period of record 1929 to 1993, the integers are 1-65)
norm precip = precipitation values are devided by the mean value for the entire record allowing direct comparison between dimensionless data sets.
norm flow = flow values are divided by the mean value for the entire record allowing direct comparison between dimensionless data sets.

Appendix A.3 Department of Ecology Ground Water Level Monitoring Data

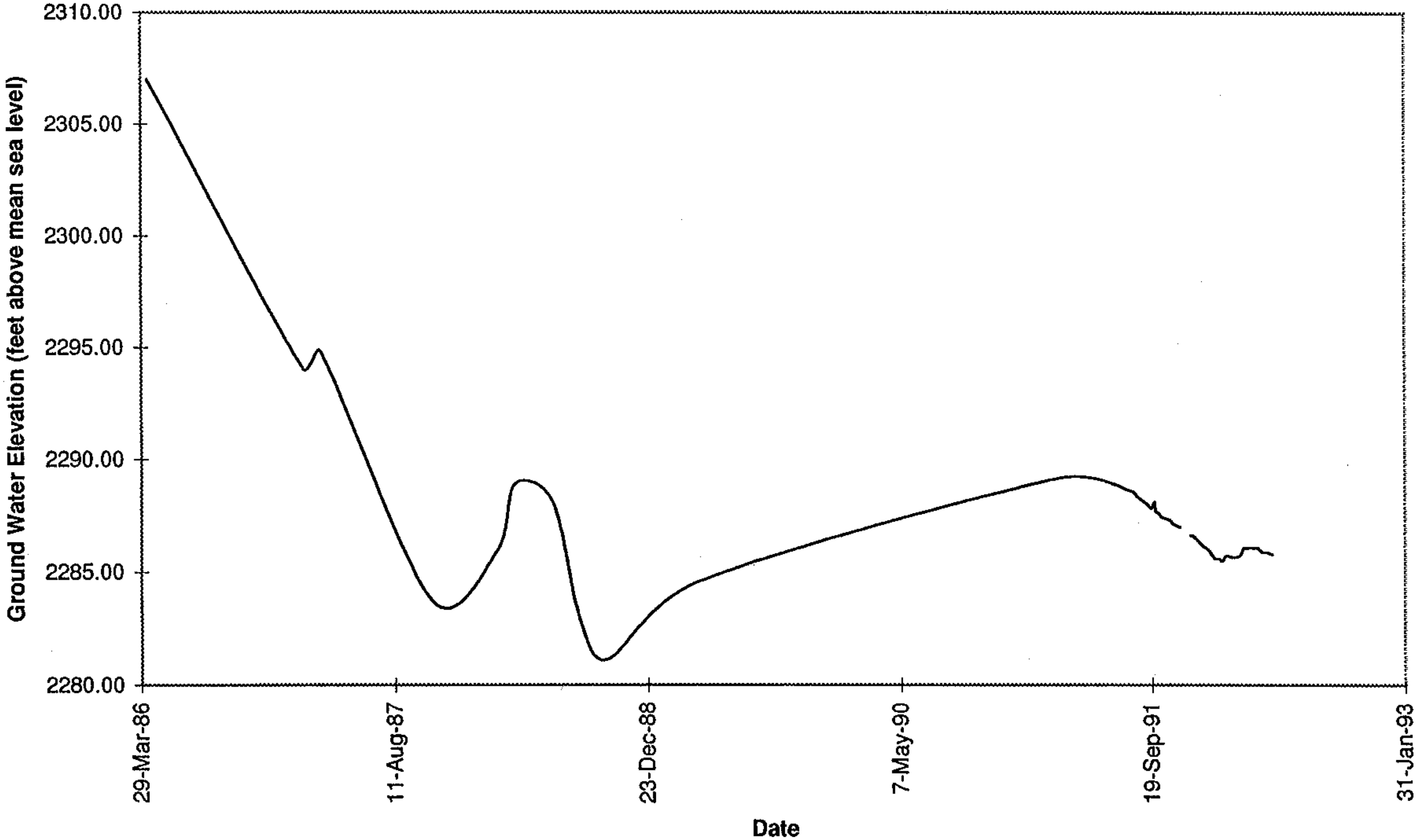
Ground Water Level Elevation at Station ERO399
WRIA 55 - Little Spokane River Watershed



WELLDATA.XLS;399 chart;4/13/95

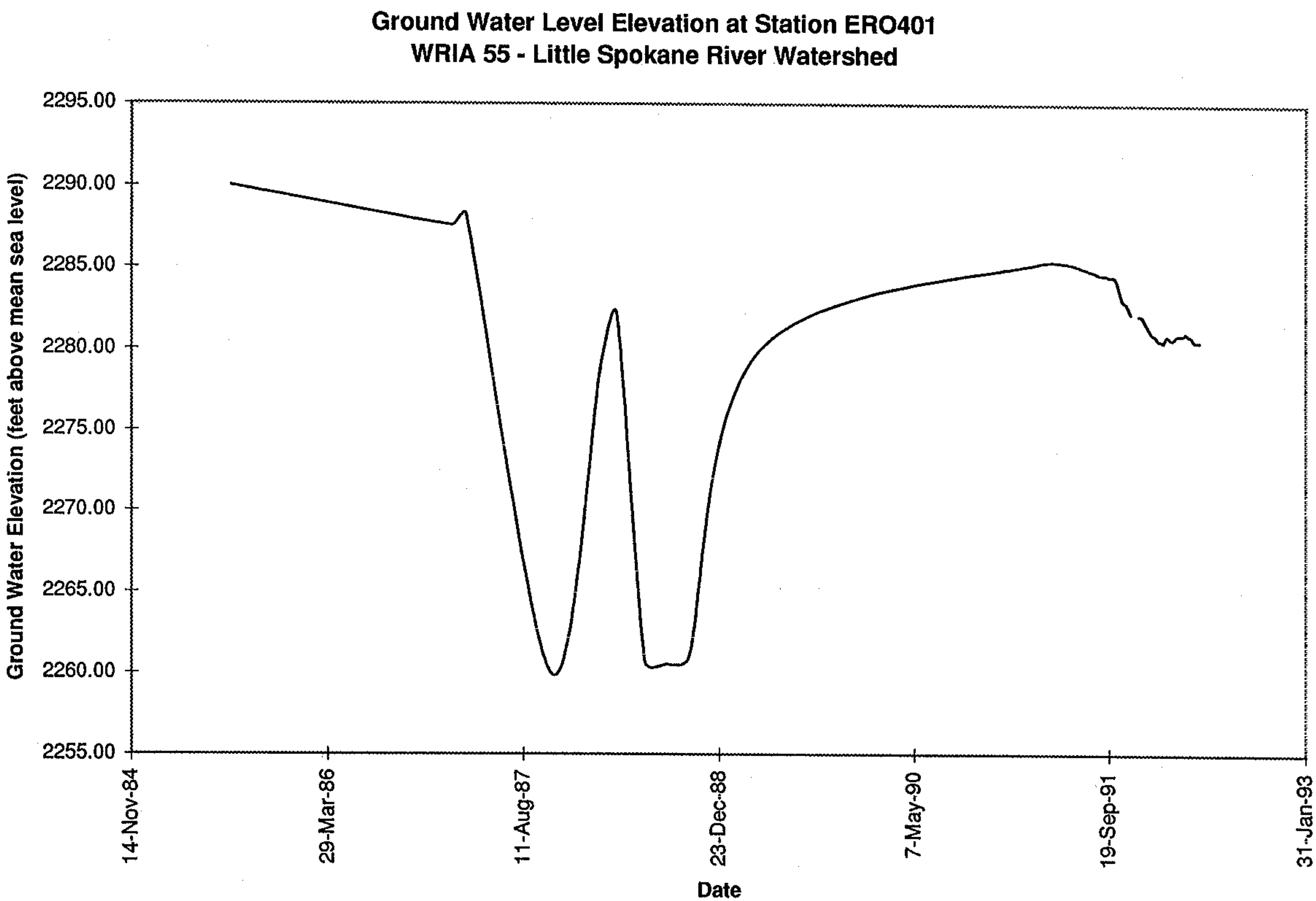
DAMES & MOORE

Ground Water Level Elevation at Station ERO400
WRIA 55 - Little Spokane River Watershed

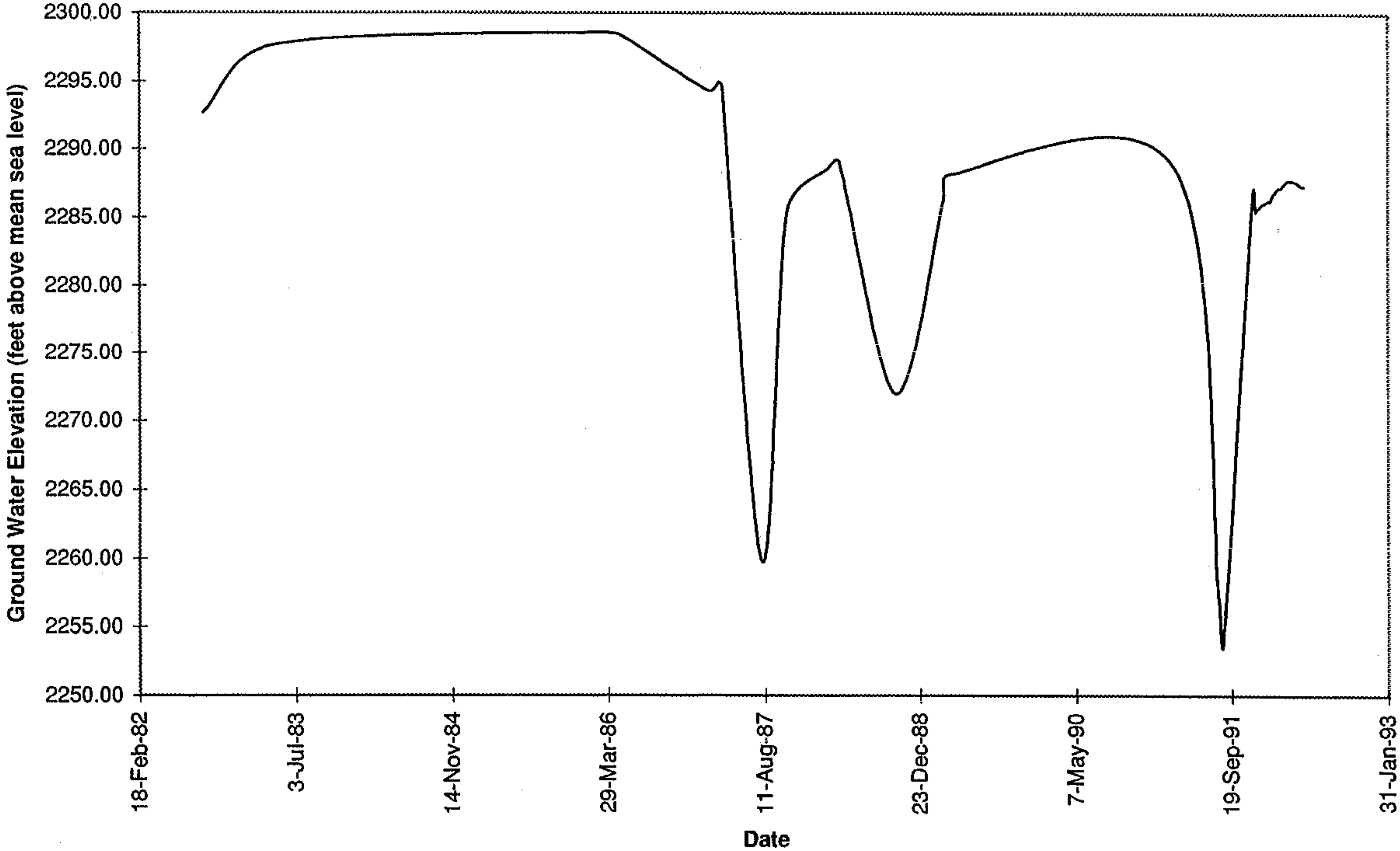


WELLDATA.XLS;400 chart;4/13/95

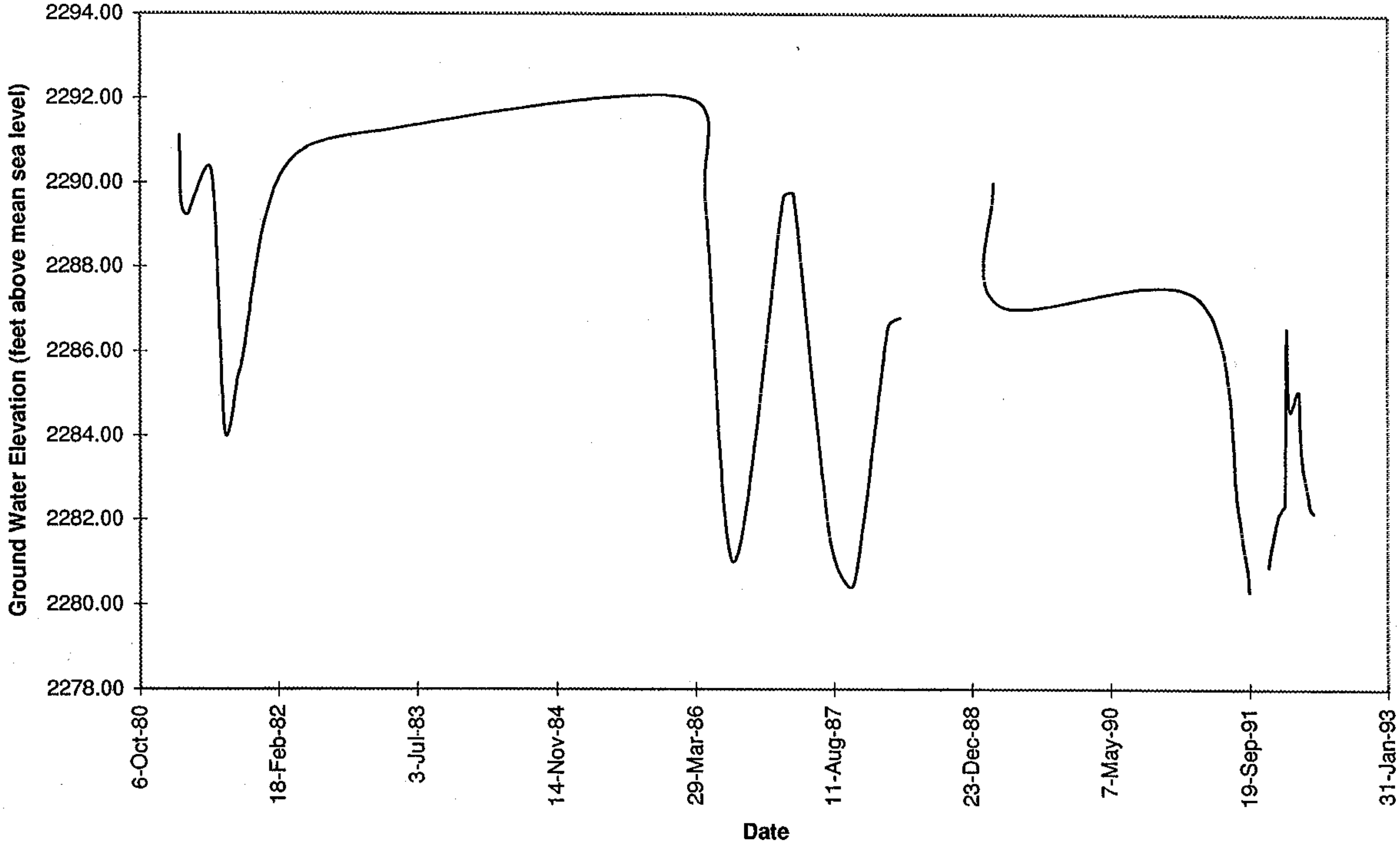
DAMES & MOORE


Ground Water Level Elevation at Station ERO401
WRIA 55 - Little Spokane River Watershed
Ground Water Elevation (feet above mean sea level)
2295.00
2290.00
2285.00
2280.00
2275.00
2270.00
2265.00
2260.00
2255.00
14-Nov-84
29-Mar-86
11-Aug-87
23-Dec-88
7-May-90
19-Sep-91
31-Jan-93
Date

Ground Water Level Elevation at Station ERO402
WRIA 55 - Little Spokane River Watershed



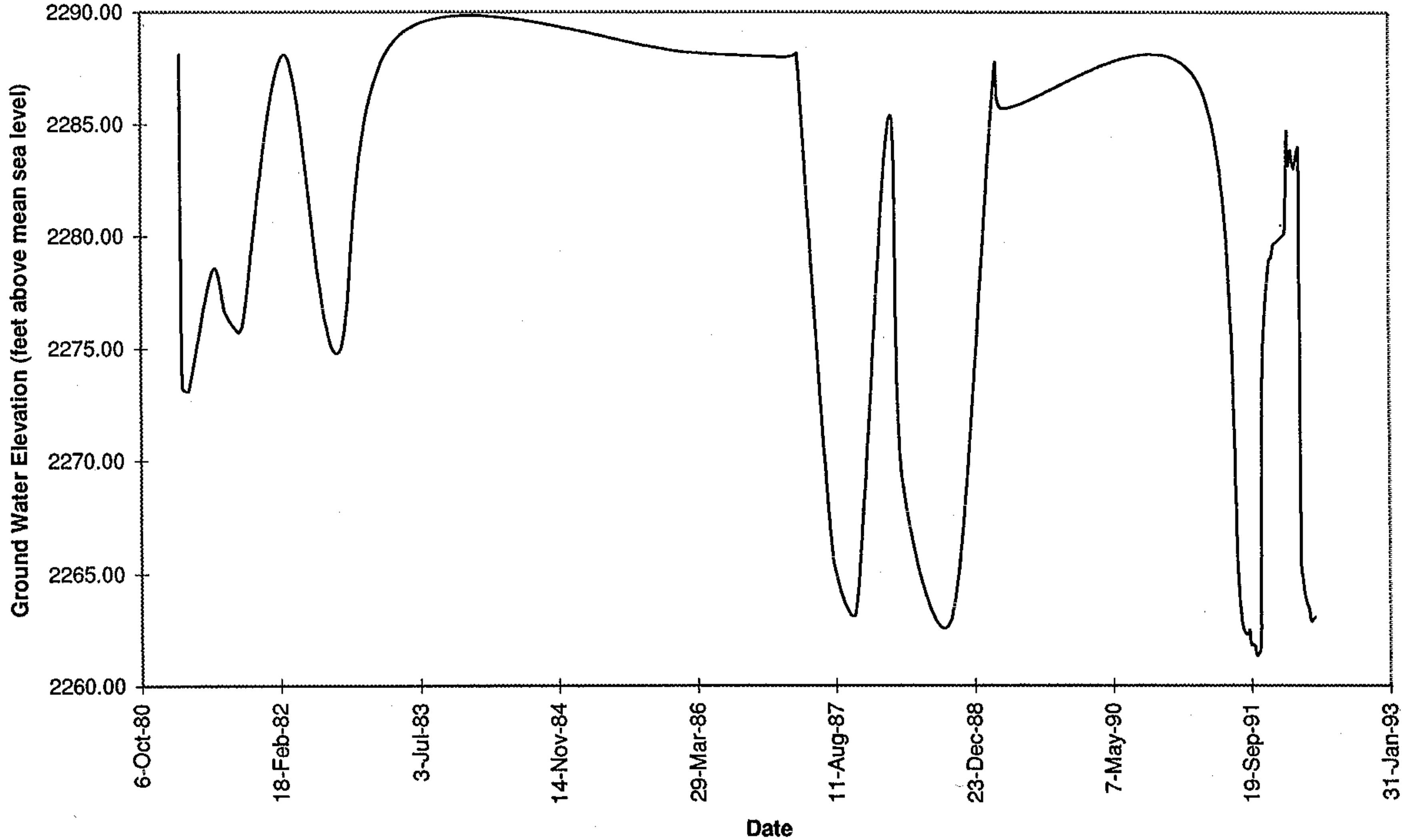
Ground Water Level Elevation at Station 403
WRIA 55 - Little Spokane River Watershed



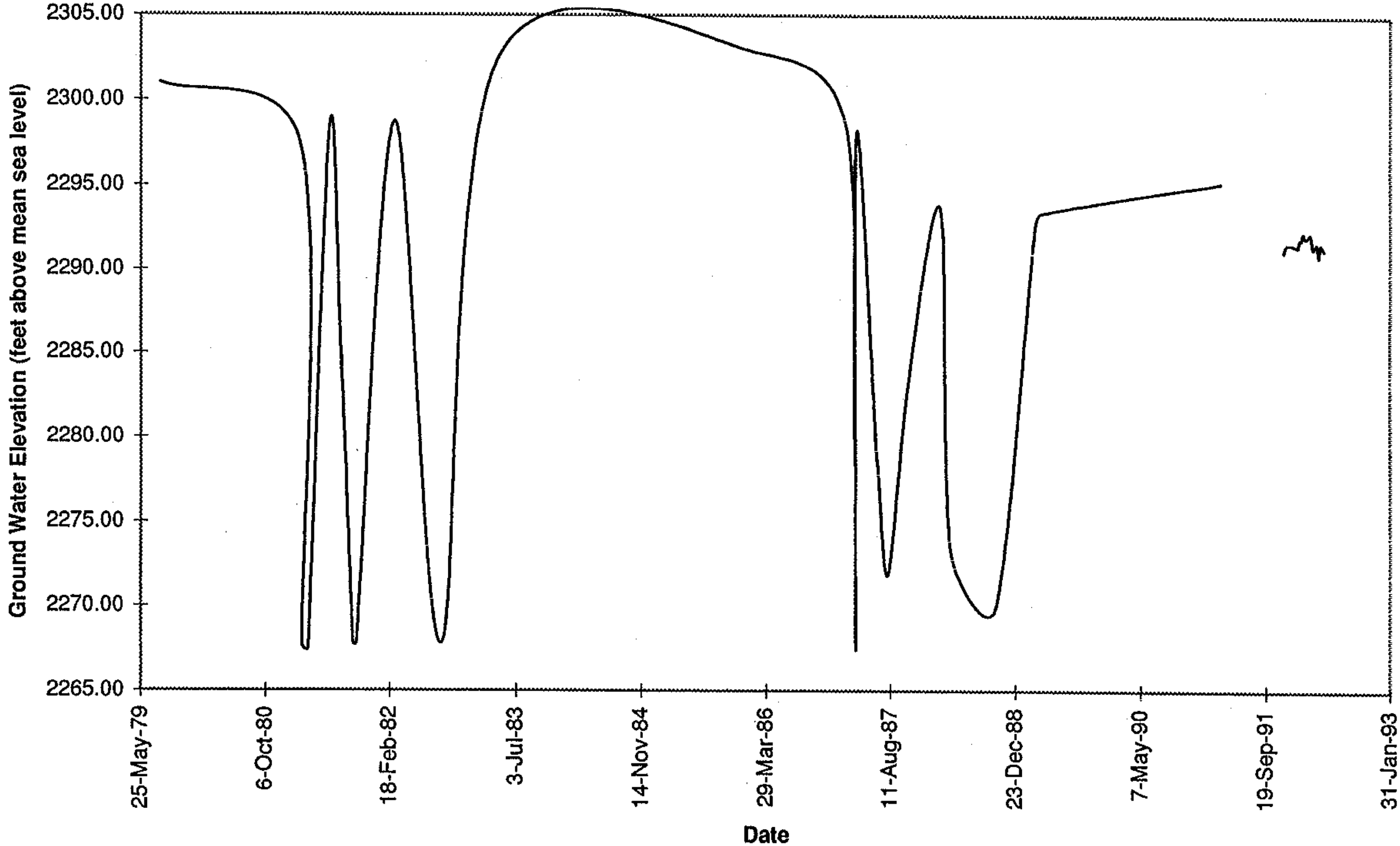
WELLDATA.XLS;403 chart;4/13/95

DAMES & MOORE

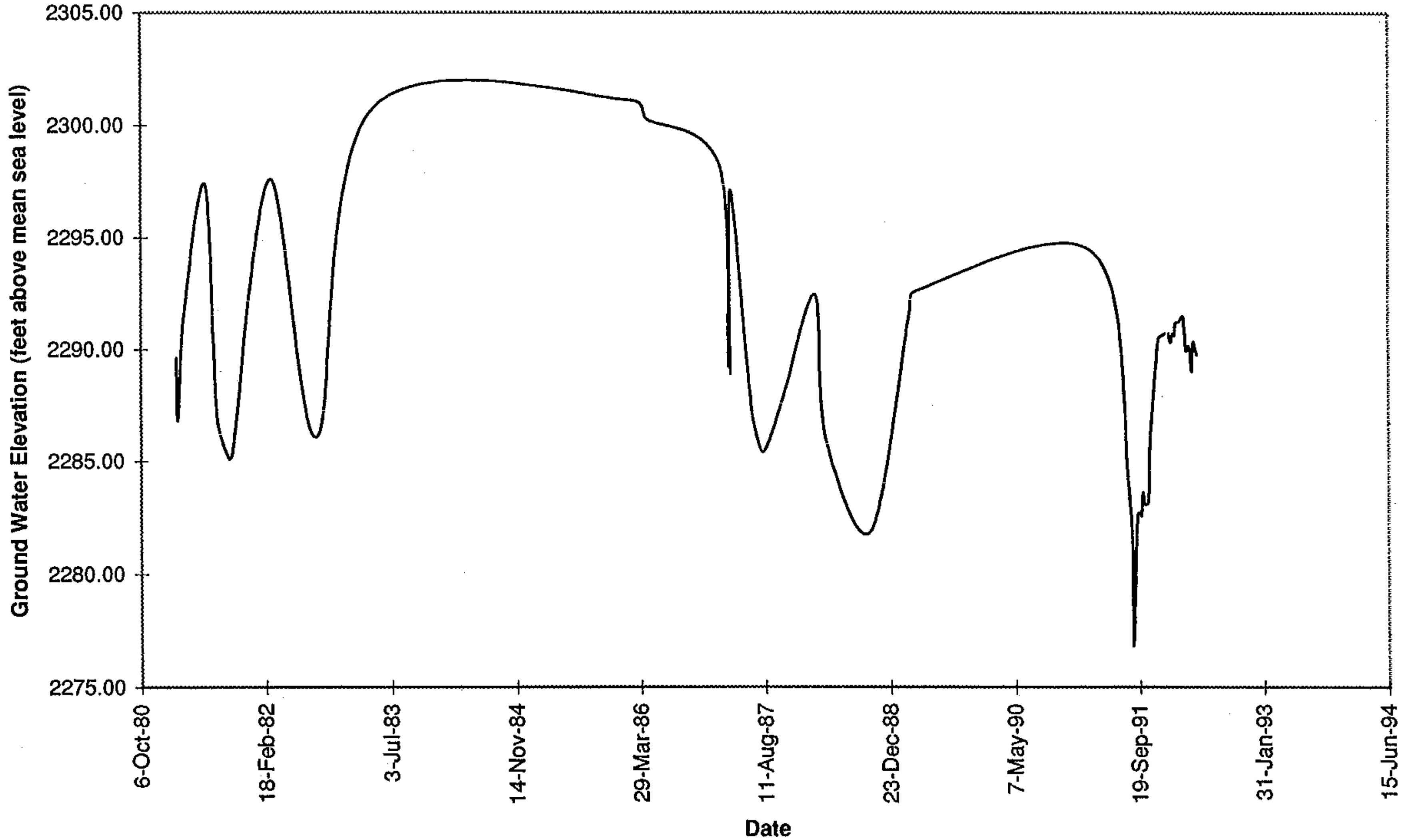
Ground Water Level Well Elevation at Station ERO404
WRIA 55 - Little Spokane River Watershed



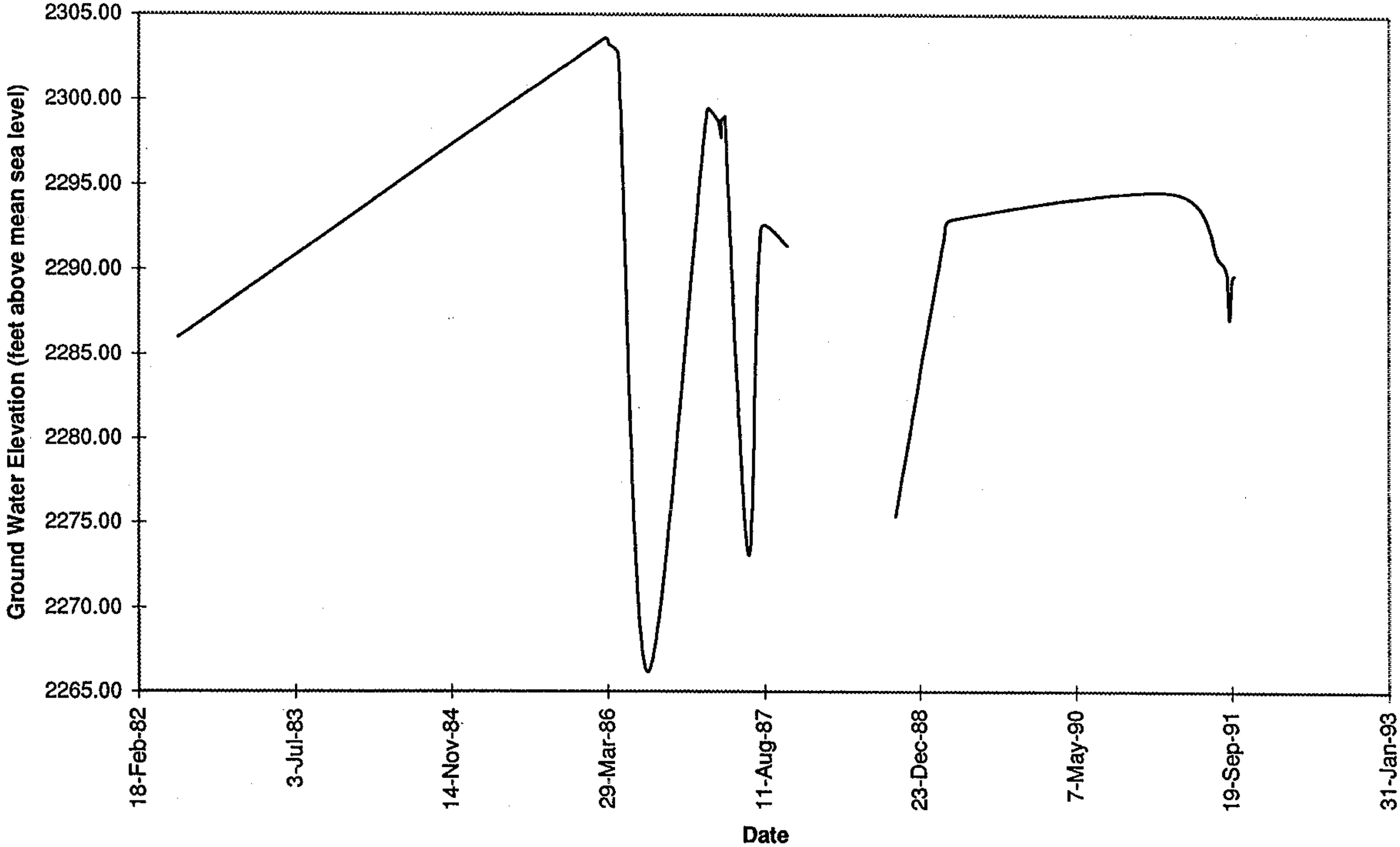
Ground Water Level Elevation at Station ERO405
WRIA 55 - Little Spokane River Watershed



Ground Water Level Elevation at Station 406
WRIA 55 - Little Spokane River Watershed



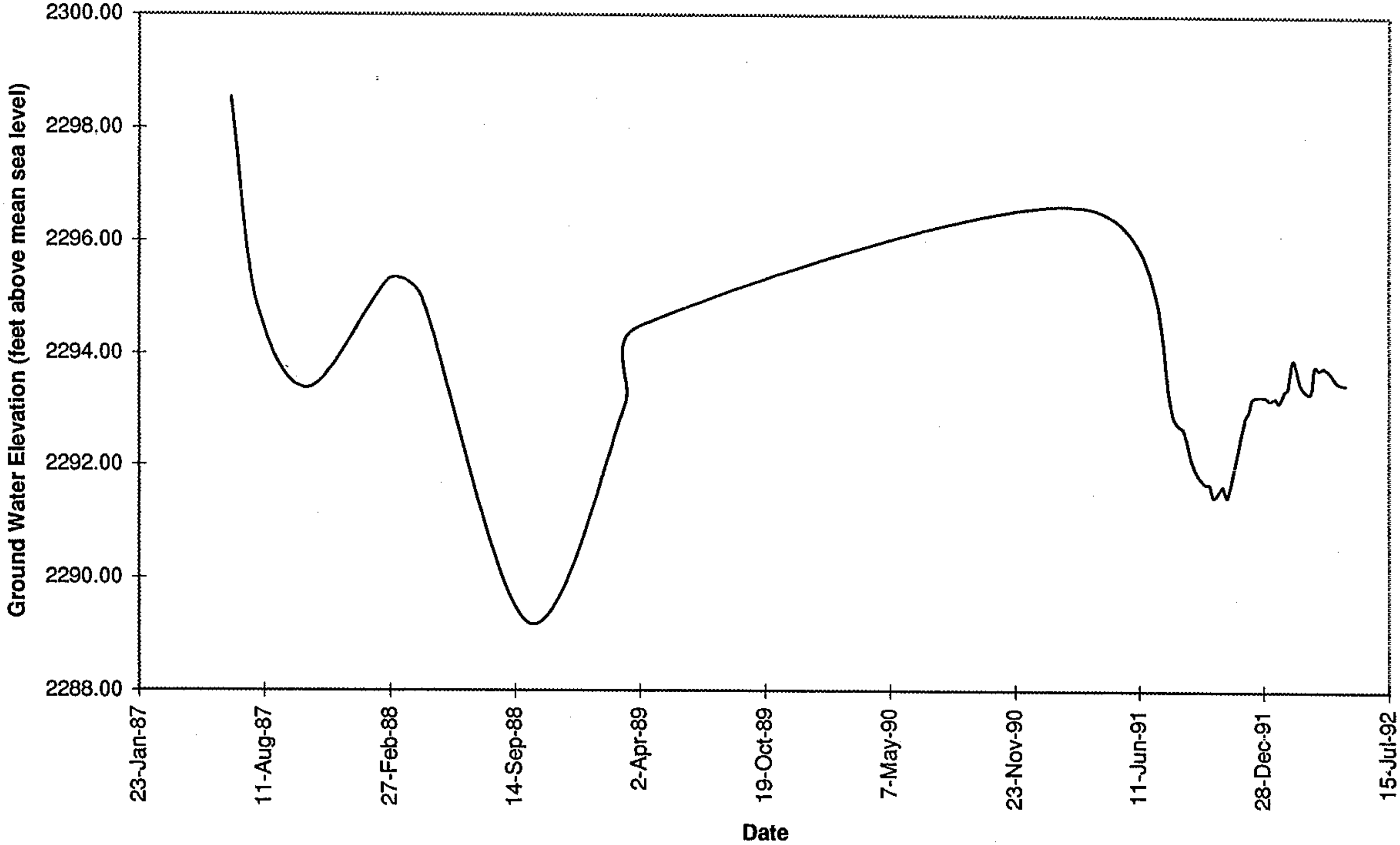
Ground Water Level Elevation at Station ERO407
WRIA 55 - Little Spokane River Watershed



WELLDATA.XLS;407 chart;4/13/95

DAMES & MOORE

Ground Water Level Elevation at Station ERO408
WRIA 55 - Little Spokane River Watershed



Ecology Ground Water Level Monitoring Record
WRIA 55 - Little Spokane River Watershed

Unique Station ID	Station Location	Date of Measurement Year	Month	Day	Water Level Measuring Point ID	Water Level Status	Water Level Elevation (feet MSL)	Water Level Depth (feet below measuring point)
ERO399	27N/44E-19M01	1987	07	31	1		2333.9	62.1
ERO399	27N/44E-19M01	1987	10	22	1		2331.8	64.2
ERO399	27N/44E-19M01	1988	02	26	1		2328.95	67.05
ERO399	27N/44E-19M01	1988	04	05	1		2328.6	67.4
ERO399	27N/44E-19M01	1988	06	16	1		2328.72	67.28
ERO399	27N/44E-19M01	1988	07	01	1		2329.3	66.7
ERO399	27N/44E-19M01	1988	08	09	1		2328.98	67.02
ERO399	27N/44E-19M01	1988	10	05	1		2328.38	67.62
ERO399	27N/44E-19M01	1989	03	10	1		2325.85	70.15
ERO399	27N/44E-19M01	1989	04	04	1		2326.5	69.5
ERO399	27N/44E-19M01	1991	03	19	1		2333.02	62.98
ERO399	27N/44E-19M01	1991	11	27	1		2333.21	62.79
ERO399	27N/44E-19M01	1991	12	04	1		2333.07	62.93
ERO399	27N/44E-19M01	1991	12	11	1		2332.92	63.08
ERO399	27N/44E-19M01	1991	12	30	1		2332.14	63.86
ERO399	27N/44E-19M01	1992	01	07	1		2331.87	64.13
ERO399	27N/44E-19M01	1992	01	15	1		2331.75	64.25
ERO399	27N/44E-19M01	1992	01	22	1		2331.47	64.53
ERO399	27N/44E-19M01	1992	01	30	1		2331.3	64.7
ERO399	27N/44E-19M01	1992	02	05	1		2331.1	64.9
ERO399	27N/44E-19M01	1992	02	13	1		2330.97	65.03
ERO399	27N/44E-19M01	1992	02	25	1		2330.66	65.34
ERO399	27N/44E-19M01	1992	03	12	1		2330.64	65.36
ERO399	27N/44E-19M01	1992	03	18	1		2330.57	65.43
ERO399	27N/44E-19M01	1992	03	25	1		2330.63	65.37
ERO399	27N/44E-19M01	1992	04	01	1		2330.71	65.29
ERO399	27N/44E-19M01	1992	04	08	1		2330.65	65.35
ERO399	27N/44E-19M01	1992	04	15	1		2330.7	65.3
ERO399	27N/44E-19M01	1992	04	23	1		2330.55	65.45
ERO399	27N/44E-19M01	1992	05	06	1		2330.69	65.31
ERO399	27N/44E-19M01	1992	05	13	1		2330.63	65.37
ERO400	27N/44E-20L01	1986	04	10	1		2307	51
ERO400	27N/44E-20L01	1987	02	10	1		2294.1	63.9
ERO400	27N/44E-20L01	1987	03	18	1		2294.83	63.17
ERO400	27N/44E-20L01	1987	10	22	1		2283.78	74.22
ERO400	27N/44E-20L01	1988	02	26	1		2285.87	72.13
ERO400	27N/44E-20L01	1988	04	05	1		2288.92	69.08
ERO400	27N/44E-20L01	1988	06	16	1		2288.13	69.87
ERO400	27N/44E-20L01	1988	08	09	1		2282.91	75.09
ERO400	27N/44E-20L01	1988	10	05	1		2281.16	76.84
ERO400	27N/44E-20L01	1989	04	04	1		2284.6	73.4
ERO400	27N/44E-20L01	1991	03	19	1		2289.17	68.83

Ecology Ground Water Level Monitoring Record

WRIA 55 - Little Spokane River Watershed

Unique Station ID	Station Location	Date of Measurement			Water Level Measuring Point ID	Water Level Status	Water Level Elevation (feet MSL)	Water Level Depth (feet below measuring point)
		Year	Month	Day				
ERO400	27N/44E-20L01	1991	08	07	1		2288.6	69.4
ERO400	27N/44E-20L01	1991	08	21	1		2288.34	69.66
ERO400	27N/44E-20L01	1991	09	11	1		2287.98	70.02
ERO400	27N/44E-20L01	1991	09	18	1		2287.82	70.18
ERO400	27N/44E-20L01	1991	09	24	1		2288.1	69.9
ERO400	27N/44E-20L01	1991	09	25	1		2287.7	70.3
ERO400	27N/44E-20L01	1991	10	02	1		2287.63	70.37
ERO400	27N/44E-20L01	1991	10	09	1		2287.42	70.58
ERO400	27N/44E-20L01	1991	10	23	1		2287.32	70.68
ERO400	27N/44E-20L01	1991	10	31	1		2287.13	70.87
ERO400	27N/44E-20L01	1991	11	13	1		2287	71
ERO400	27N/44E-20L01	1991	11	27				
ERO400	27N/44E-20L01	1991	12	04	1		2286.63	71.37
ERO400	27N/44E-20L01	1991	12	11	1		2286.57	71.43
ERO400	27N/44E-20L01	1991	12	30	1		2286.14	71.86
ERO400	27N/44E-20L01	1992	01	07	1		2286	72
ERO400	27N/44E-20L01	1992	01	15	1		2285.8	72.2
ERO400	27N/44E-20L01	1992	01	22	1		2285.61	72.39
ERO400	27N/44E-20L01	1992	01	30	1		2285.58	72.42
ERO400	27N/44E-20L01	1992	02	05	1		2285.48	72.52
ERO400	27N/44E-20L01	1992	02	13	1		2285.73	72.27
ERO400	27N/44E-20L01	1992	02	25	1		2285.66	72.34
ERO400	27N/44E-20L01	1992	03	12	1		2285.75	72.25
ERO400	27N/44E-20L01	1992	03	18	1		2286.05	71.95
ERO400	27N/44E-20L01	1992	03	25	1		2286.05	71.95
ERO400	27N/44E-20L01	1992	04	01	1		2286.08	71.92
ERO400	27N/44E-20L01	1992	04	08	1		2286.05	71.95
ERO400	27N/44E-20L01	1992	04	15	1		2286.07	71.93
ERO400	27N/44E-20L01	1992	04	23	1		2285.88	72.12
ERO400	27N/44E-20L01	1992	05	06	1		2285.87	72.13
ERO400	27N/44E-20L01	1992	05	13	1		2285.77	72.23
ERO401	27N/44E-20L02	1985	07	24	1		2290	56
ERO401	27N/44E-20L02	1987	02	10	1		2287.57	58.43
ERO401	27N/44E-20L02	1987	03	18	1		2288.2	57.8
ERO401	27N/44E-20L02	1987	10	22	1	P	2259.95	86.05
ERO401	27N/44E-20L02	1988	02	26	1		2279.4	66.6
ERO401	27N/44E-20L02	1988	04	05	1		2282.12	63.88
ERO401	27N/44E-20L02	1988	06	16	1	P	2260.69	85.31
ERO401	27N/44E-20L02	1988	08	09	1	P	2260.56	85.44
ERO401	27N/44E-20L02	1988	10	05	1		2260.93	85.07
ERO401	27N/44E-20L02	1989	04	04	1		2279.9	66.1
ERO401	27N/44E-20L02	1991	03	19	1		2285.28	60.72
ERO401	27N/44E-20L02	1991	08	07	1		2284.8	61.2

Ecology Ground Water Level Monitoring Record
WRIA 55 - Little Spokane River Watershed

Unique Station ID	Station Location	Date of Measurement			Water Level Measuring Point ID	Water Level Status	Water Level Elevation (feet MSL)	Water Level Depth (feet below measuring point)
		Year	Month	Day				
ERO401	27N/44E-20L02	1991	08	21	1		2284.66	61.34
ERO401	27N/44E-20L02	1991	09	04	1		2284.6	61.4
ERO401	27N/44E-20L02	1991	09	11	1		2284.58	61.42
ERO401	27N/44E-20L02	1991	09	18	1		2284.5	61.5
ERO401	27N/44E-20L02	1991	09	25	1		2284.5	61.5
ERO401	27N/44E-20L02	1991	10	02	1		2284.45	61.55
ERO401	27N/44E-20L02	1991	10	09	1		2284.2	61.8
ERO401	27N/44E-20L02	1991	10	23	2		2283.05	59.95
ERO401	27N/44E-20L02	1991	10	31	2		2282.9	60.1
ERO401	27N/44E-20L02	1991	11	13	2		2282.27	60.73
ERO401	27N/44E-20L02	1991	11	27				
ERO401	27N/44E-20L02	1991	12	04	2		2282.15	60.85
ERO401	27N/44E-20L02	1991	12	11	2		2282.08	60.92
ERO401	27N/44E-20L02	1991	12	30	2		2281.27	61.73
ERO401	27N/44E-20L02	1992	01	07	2		2281	62
ERO401	27N/44E-20L02	1992	01	15	2		2280.88	62.12
ERO401	27N/44E-20L02	1992	01	22	2		2280.62	62.38
ERO401	27N/44E-20L02	1992	01	30	2		2280.58	62.42
ERO401	27N/44E-20L02	1992	02	05	2		2280.48	62.52
ERO401	27N/44E-20L02	1992	02	13	2		2280.87	62.13
ERO401	27N/44E-20L02	1992	02	25	2		2280.67	62.33
ERO401	27N/44E-20L02	1992	03	12	2		2280.92	62.08
ERO401	27N/44E-20L02	1992	03	18	2		2280.92	62.08
ERO401	27N/44E-20L02	1992	03	25	2		2280.92	62.08
ERO401	27N/44E-20L02	1992	04	01	2		2281.05	61.95
ERO401	27N/44E-20L02	1992	04	08	2		2280.91	62.09
ERO401	27N/44E-20L02	1992	04	15	2		2280.82	62.18
ERO401	27N/44E-20L02	1992	04	23	2		2280.55	62.45
ERO401	27N/44E-20L02	1992	05	06	2		2280.52	62.48
ERO401	27N/44E-20L02	1992	05	13				
ERO402	27N/44E-20B04	1982	09	10	1		2292.65	6.35
ERO402	27N/44E-20B04	1983	04	28	1		2297.65	1.35
ERO402	27N/44E-20B04	1986	03	07	1		2298.6	.4
ERO402	27N/44E-20B04	1986	05	05	1		2298.43	.57
ERO402	27N/44E-20B04	1987	02	10	1		2294.33	4.67
ERO402	27N/44E-20B04	1987	03	18	1		2294.95	4.05
ERO402	27N/44E-20B04	1987	03	28	1		2294.64	4.36
ERO402	27N/44E-20B04	1987	07	31	1	P	2259.8	39.2
ERO402	27N/44E-20B04	1987	10	22	1		2285.5	13.5
ERO402	27N/44E-20B04	1988	02	26	1		2288.52	10.48
ERO402	27N/44E-20B04	1988	04	07	1		2289.1	9.9
ERO402	27N/44E-20B04	1988	10	05	1	P	2271.99	27.01
ERO402	27N/44E-20B04	1989	03	10	1		2286.25	12.75

Ecology Ground Water Level Monitoring Record

WRIA 55 - Little Spokane River Watershed

Unique Station ID	Station Location	Date of Measurement Year	Month	Day	Water Level Measuring Point ID	Water Level Status	Water Level Elevation (feet MSL)	Water Level Depth (feet below measuring point)
ERO402	27N/44E-20B04	1989	04	04	1		2288.2	10.8
ERO402	27N/44E-20B04	1991	03	19	1		2288.7	10.3
ERO402	27N/44E-20B04	1991	08	07	1	P	2257.13	41.87
ERO402	27N/44E-20B04	1991	08	21	1	P	2253.82	45.18
ERO402	27N/44E-20B04	1991	11	27	1		2287.05	11.95
ERO402	27N/44E-20B04	1991	12	04	1		2285.52	13.48
ERO402	27N/44E-20B04	1991	12	11	1		2285.71	13.29
ERO402	27N/44E-20B04	1991	12	30	1		2286.09	12.91
ERO402	27N/44E-20B04	1992	01	07	1		2286.15	12.85
ERO402	27N/44E-20B04	1992	01	15	1		2286.25	12.75
ERO402	27N/44E-20B04	1992	01	22	1		2286.25	12.75
ERO402	27N/44E-20B04	1992	01	30	1		2286.75	12.25
ERO402	27N/44E-20B04	1992	02	05	1		2286.88	12.12
ERO402	27N/44E-20B04	1992	02	13	1		2287.2	11.8
ERO402	27N/44E-20B04	1992	02	25	1		2287.27	11.73
ERO402	27N/44E-20B04	1992	03	12	1		2287.73	11.27
ERO402	27N/44E-20B04	1992	03	25	1	S	2287.74	11.26
ERO402	27N/44E-20B04	1992	03	28	1	S	2287.72	11.28
ERO402	27N/44E-20B04	1992	04	01	1	S	2287.76	11.24
ERO402	27N/44E-20B04	1992	04	08	1	S	2287.68	11.32
ERO402	27N/44E-20B04	1992	04	15	1	S	2287.65	11.35
ERO402	27N/44E-20B04	1992	04	23	1	S	2287.44	11.56
ERO402	27N/44E-20B04	1992	05	06	1	S	2287.35	11.65
ERO403	27N/44E-20B05	1981	02	25	1		2291.1	2.9
ERO403	27N/44E-20B05	1981	03	03	1		2289.56	4.44
ERO403	27N/44E-20B05	1981	03	27	1		2289.24	4.76
ERO403	27N/44E-20B05	1981	06	23	1		2290.25	3.75
ERO403	27N/44E-20B05	1981	08	07	1	R	2284.13	9.87
ERO403	27N/44E-20B05	1981	09	24	1		2285.4	8.6
ERO403	27N/44E-20B05	1981	10	08	1		2285.7	8.3
ERO403	27N/44E-20B05	1982	03	10	1		2290.3	3.7
ERO403	27N/44E-20B05	1983	04	28	1		2291.3	2.7
ERO403	27N/44E-20B05	1986	03	07	1		2292	2
ERO403	27N/44E-20B05	1986	05	05	1	R	2289.5	4.5
ERO403	27N/44E-20B05	1986	08	13	1	R	2281	13
ERO403	27N/44E-20B05	1987	02	10	1		2289.67	4.33
ERO403	27N/44E-20B05	1987	03	18	1		2289.75	4.25
ERO403	27N/44E-20B05	1987	03	28	1		2289.2	4.8
ERO403	27N/44E-20B05	1987	07	31	1		2281.44	12.56
ERO403	27N/44E-20B05	1987	10	22	1		2280.47	13.53
ERO403	27N/44E-20B05	1988	02	26	1		2286.59	7.41
ERO403	27N/44E-20B05	1988	04	07	1		2286.8	7.2
ERO403	27N/44E-20B05	1988	10	05		D		

Ecology Ground Water Level Monitoring Record
WRIA 55 - Little Spokane River Watershed

Unique Station ID	Station Location	Date of Measurement			Water Level Measuring Point ID	Water Level Status	Water Level Elevation (feet MSL)	Water Level Depth (feet below measuring point)
		Year	Month	Day				
ERO403	27N/44E-20B05	1989	03	10	1		2290	4
ERO403	27N/44E-20B05	1989	04	04	1		2287.1	6.9
ERO403	27N/44E-20B05	1991	03	19	1		2287.27	6.73
ERO403	27N/44E-20B05	1991	08	07	1	S	2282.25	11.75
ERO403	27N/44E-20B05	1991	08	21	1		2281.66	12.34
ERO403	27N/44E-20B05	1991	09	04	1		2281.07	12.93
ERO403	27N/44E-20B05	1991	09	11	1		2280.79	13.21
ERO403	27N/44E-20B05	1991	09	18	1		2280.3	13.7
ERO403	27N/44E-20B05	1991	09	25		D		
ERO403	27N/44E-20B05	1991	10	02		D		
ERO403	27N/44E-20B05	1991	10	09		D		
ERO403	27N/44E-20B05	1991	10	23		D		
ERO403	27N/44E-20B05	1991	10	31		D		
ERO403	27N/44E-20B05	1991	11	27	1		2280.9	13.1
ERO403	27N/44E-20B05	1991	12	04	1		2281.24	12.76
ERO403	27N/44E-20B05	1991	12	11	1		2281.49	12.51
ERO403	27N/44E-20B05	1991	12	30	1		2282.09	11.91
ERO403	27N/44E-20B05	1992	01	07	1		2282.17	11.83
ERO403	27N/44E-20B05	1992	01	15	1		2282.3	11.7
ERO403	27N/44E-20B05	1992	01	22	1		2282.35	11.65
ERO403	27N/44E-20B05	1992	01	30	1		2286.49	7.51
ERO403	27N/44E-20B05	1992	02	05	1		2284.8	9.2
ERO403	27N/44E-20B05	1992	02	13	1		2284.6	9.4
ERO403	27N/44E-20B05	1992	02	25	1		2284.8	9.2
ERO403	27N/44E-20B05	1992	03	12	1		2285.04	8.96
ERO403	27N/44E-20B05	1992	03	18	1	S	2284.03	9.97
ERO403	27N/44E-20B05	1992	03	25	1	S	2283.37	10.63
ERO403	27N/44E-20B05	1992	04	01	1	S	2283.1	10.9
ERO403	27N/44E-20B05	1992	04	08	1	S	2282.85	11.15
ERO403	27N/44E-20B05	1992	04	15	1	S	2282.6	11.4
ERO403	27N/44E-20B05	1992	04	23	1	S	2282.3	11.7
ERO403	27N/44E-20B05	1992	05	06	1	S	2282.17	11.83
ERO404	27N/44E-20B01	1950	04	20				
ERO404	27N/44E-20B01	1981	02	24	1		2288.1	.9
ERO404	27N/44E-20B01	1981	03	03	1	P	2273.3	15.7
ERO404	27N/44E-20B01	1981	03	27	1	P	2273.1	15.9
ERO404	27N/44E-20B01	1981	06	23	1		2278.45	10.55
ERO404	27N/44E-20B01	1981	08	07	1	P	2276.6	12.4
ERO404	27N/44E-20B01	1981	09	24	1	P	2275.7	13.3
ERO404	27N/44E-20B01	1981	10	08	1	P	2276	13
ERO404	27N/44E-20B01	1982	03	10	1		2288.1	.9
ERO404	27N/44E-20B01	1982	09	10	1	P	2274.75	14.25
ERO404	27N/44E-20B01	1983	04	28	1	F	2289	0

Ecology Ground Water Level Monitoring Record
WRIA 55 - Little Spokane River Watershed

Unique Station ID	Station Location	Date of Measurement			Water Level Measuring Point ID	Water Level Status	Water Level Elevation (feet MSL)	Water Level Depth (feet below measuring point)
		Year	Month	Day				
ERO404	27N/44E-20B01	1986	03	07	1		2288.2	.8
ERO404	27N/44E-20B01	1987	02	10	1		2288	1
ERO404	27N/44E-20B01	1987	03	18	1		2288.1	.9
ERO404	27N/44E-20B01	1987	03	28	1		2288.13	.87
ERO404	27N/44E-20B01	1987	07	31	1	P	2265.94	23.06
ERO404	27N/44E-20B01	1987	10	22	1	P	2263.39	25.61
ERO404	27N/44E-20B01	1988	02	26	1		2285.34	3.66
ERO404	27N/44E-20B01	1988	04	07	1	P	2269.1	19.9
ERO404	27N/44E-20B01	1988	10	05	1	P	2263.25	25.75
ERO404	27N/44E-20B01	1989	03	10	1		2287.6	1.4
ERO404	27N/44E-20B01	1989	04	04	1		2285.7	3.3
ERO404	27N/44E-20B01	1991	03	19	2		2286.78	2.22
ERO404	27N/44E-20B01	1991	08	07	2	P	2263.97	25.03
ERO404	27N/44E-20B01	1991	08	21	2	P	2262.55	26.45
ERO404	27N/44E-20B01	1991	09	04	2	P	2262.29	26.71
ERO404	27N/44E-20B01	1991	09	11	2	P	2262.5	26.5
ERO404	27N/44E-20B01	1991	09	18	2	P	2261.87	27.13
ERO404	27N/44E-20B01	1991	09	25	2	P	2261.85	27.15
ERO404	27N/44E-20B01	1991	10	02	2	P	2261.77	27.23
ERO404	27N/44E-20B01	1991	10	09	2	P	2261.34	27.66
ERO404	27N/44E-20B01	1991	10	23	2	P	2261.72	27.28
ERO404	27N/44E-20B01	1991	10	31	2		2274.05	14.95
ERO404	27N/44E-20B01	1991	11	27	2		2278.95	10.05
ERO404	27N/44E-20B01	1991	12	04	2		2279.03	9.97
ERO404	27N/44E-20B01	1991	12	11	2		2279.59	9.41
ERO404	27N/44E-20B01	1991	12	30	2		2279.8	9.2
ERO404	27N/44E-20B01	1992	01	07	2		2279.91	9.09
ERO404	27N/44E-20B01	1992	01	15	2		2280.01	8.99
ERO404	27N/44E-20B01	1992	01	22	2		2280.16	8.84
ERO404	27N/44E-20B01	1992	01	30	2		2284.63	4.37
ERO404	27N/44E-20B01	1992	02	05	2		2283.15	5.85
ERO404	27N/44E-20B01	1992	02	13	2		2283.86	5.14
ERO404	27N/44E-20B01	1992	02	25	2		2283.03	5.97
ERO404	27N/44E-20B01	1992	03	12	2		2283.9	5.1
ERO404	27N/44E-20B01	1992	03	18	2	P	2265.5	23.5
ERO404	27N/44E-20B01	1992	03	25	2	P	2264.7	24.3
ERO404	27N/44E-20B01	1992	04	01	2	P	2264.11	24.89
ERO404	27N/44E-20B01	1992	04	08	2	P	2263.7	25.3
ERO404	27N/44E-20B01	1992	04	15	2	P	2263.47	25.53
ERO404	27N/44E-20B01	1992	04	23	2	P	2262.92	26.08
ERO404	27N/44E-20B01	1992	05	06	2	P	2263.07	25.93
ERO405	27N/44E-20B02	1979	08	11	1		2301	5
ERO405	27N/44E-20B02	1981	02	24	1		2297.4	8.6

Ecology Ground Water Level Monitoring Record
WRIA 55 - Little Spokane River Watershed

Unique Station ID	Station Location	Date of Measurement			Water Level Measuring Point ID	Water Level Status	Water Level Elevation (feet MSL)	Water Level Depth (feet below measuring point)
		Year	Month	Day				
ERO405	27N/44E-20B02	1981	03	03	1	P	2267.7	38.3
ERO405	27N/44E-20B02	1981	03	27	1	P	2267.5	38.5
ERO405	27N/44E-20B02	1981	06	23	1		2298.5	7.5
ERO405	27N/44E-20B02	1981	08	07	1	R	2285.3	20.7
ERO405	27N/44E-20B02	1981	09	24	1	P	2267.76	38.24
ERO405	27N/44E-20B02	1981	10	08	1	P	2267.75	38.25
ERO405	27N/44E-20B02	1982	03	10	1		2298.7	7.3
ERO405	27N/44E-20B02	1982	09	10	1	P	2267.8	38.2
ERO405	27N/44E-20B02	1983	04	28	1		2302.6	3.4
ERO405	27N/44E-20B02	1986	03	07	1		2302.8	3.2
ERO405	27N/44E-20B02	1987	02	10	1		2298.6	7.4
ERO405	27N/44E-20B02	1987	03	16	1	P	2280	26
ERO405	27N/44E-20B02	1987	03	18	1		2296.38	9.62
ERO405	27N/44E-20B02	1987	03	25	1	P	2267.43	38.57
ERO405	27N/44E-20B02	1987	03	26	1		2298.1	7.9
ERO405	27N/44E-20B02	1987	06	19	1	P	2278.65	27.35
ERO405	27N/44E-20B02	1987	07	31	1	P	2271.88	34.12
ERO405	27N/44E-20B02	1987	10	22	1	P	2283.35	22.65
ERO405	27N/44E-20B02	1988	02	26	1		2293.64	12.36
ERO405	27N/44E-20B02	1988	04	07	1	P	2273.3	32.7
ERO405	27N/44E-20B02	1988	10	05	1	P	2269.93	36.07
ERO405	27N/44E-20B02	1989	03	10	1		2292.5	13.5
ERO405	27N/44E-20B02	1989	04	04	1		2293.4	12.6
ERO405	27N/44E-20B02	1991	03	19	1		2295.21	10.79
ERO405	27N/44E-20B02	1991	08	07		P		
ERO405	27N/44E-20B02	1991	11	27	1		2291.14	14.86
ERO405	27N/44E-20B02	1991	12	04	1		2291.44	14.56
ERO405	27N/44E-20B02	1991	12	11	1		2291.6	14.4
ERO405	27N/44E-20B02	1991	12	30	1		2291.59	14.41
ERO405	27N/44E-20B02	1992	01	07	1		2291.52	14.48
ERO405	27N/44E-20B02	1992	01	15	1		2291.52	14.48
ERO405	27N/44E-20B02	1992	01	22	1		2291.44	14.56
ERO405	27N/44E-20B02	1992	01	30	1		2291.89	14.11
ERO405	27N/44E-20B02	1992	02	05	1		2291.88	14.12
ERO405	27N/44E-20B02	1992	02	13	1		2292.27	13.73
ERO405	27N/44E-20B02	1992	02	25	1		2291.96	14.04
ERO405	27N/44E-20B02	1992	03	12	1		2292.21	13.79
ERO405	27N/44E-20B02	1992	03	18	1	S	2291.82	14.18
ERO405	27N/44E-20B02	1992	03	25	1	S	2291.35	14.65
ERO405	27N/44E-20B02	1992	04	01	1	S	2291.52	14.48
ERO405	27N/44E-20B02	1992	04	08	1	S	2291.63	14.37
ERO405	27N/44E-20B02	1992	04	15	1	S	2290.85	15.15
ERO405	27N/44E-20B02	1992	04	23	1	S	2291.6	14.4

Ecology Ground Water Level Monitoring Record
WRIA 55 - Little Spokane River Watershed

Unique Station ID	Station Location	Date of Measurement			Water Level Measuring Point ID	Water Level Status	Water Level Elevation (feet MSL)	Water Level Depth (feet below measuring point)
		Year	Month	Day				
ERO405	27N/44E-20B02	1992	05	06	1	S	2291.25	14.75
ERO406	27N/44E-20B03	1976	08	06				9
ERO406	27N/44E-20B03	1981	02	26	1		2289.6	19
ERO406	27N/44E-20B03	1981	03	03	1		2286.85	21.75
ERO406	27N/44E-20B03	1981	03	27	1		2291.45	17.15
ERO406	27N/44E-20B03	1981	06	23	1		2297.35	11.25
ERO406	27N/44E-20B03	1981	08	07	1		2287	21.6
ERO406	27N/44E-20B03	1981	09	24	1		2285.1	23.5
ERO406	27N/44E-20B03	1981	10	08	1		2285.35	23.25
ERO406	27N/44E-20B03	1982	03	10	1		2297.6	11
ERO406	27N/44E-20B03	1982	09	10	1		2286.1	22.5
ERO406	27N/44E-20B03	1983	04	28	1		2300.8	7.8
ERO406	27N/44E-20B03	1986	03	07	1		2301.1	7.5
ERO406	27N/44E-20B03	1986	04	23	1	R	2300.3	8.3
ERO406	27N/44E-20B03	1987	02	10	1		2298.26	10.34
ERO406	27N/44E-20B03	1987	03	16	1	S	2289.25	19.35
ERO406	27N/44E-20B03	1987	03	18	1	R	2295.9	12.7
ERO406	27N/44E-20B03	1987	03	25	1		2288.9	19.7
ERO406	27N/44E-20B03	1987	03	26	1		2297.12	11.48
ERO406	27N/44E-20B03	1987	06	19	1		2287.24	21.36
ERO406	27N/44E-20B03	1987	07	31	1		2285.41	23.19
ERO406	27N/44E-20B03	1987	10	22	1		2287.89	20.71
ERO406	27N/44E-20B03	1988	02	26	1		2292.43	16.17
ERO406	27N/44E-20B03	1988	04	07	1	S	2286	22.6
ERO406	27N/44E-20B03	1988	10	05	1		2281.93	26.67
ERO406	27N/44E-20B03	1989	03	10	1		2291.6	17
ERO406	27N/44E-20B03	1989	04	04	1		2292.6	16
ERO406	27N/44E-20B03	1991	03	19	1		2294.33	14.27
ERO406	27N/44E-20B03	1991	08	07	1	S	2283.75	24.85
ERO406	27N/44E-20B03	1991	08	21	1	S	2276.85	31.75
ERO406	27N/44E-20B03	1991	09	04	1	S	2281.54	27.06
ERO406	27N/44E-20B03	1991	09	11	1	S	2282.7	25.9
ERO406	27N/44E-20B03	1991	09	18	1	S	2282.68	25.92
ERO406	27N/44E-20B03	1991	09	25	1	S	2282.6	26
ERO406	27N/44E-20B03	1991	10	02	1	S	2283.6	25
ERO406	27N/44E-20B03	1991	10	09	1	S	2283.07	25.53
ERO406	27N/44E-20B03	1991	10	23	1	S	2283.22	25.38
ERO406	27N/44E-20B03	1991	10	31	1		2285.69	22.91
ERO406	27N/44E-20B03	1991	11	27	1		2289.85	18.75
ERO406	27N/44E-20B03	1991	12	04	1		2290.47	18.13
ERO406	27N/44E-20B03	1991	12	11	1		2290.56	18.04
ERO406	27N/44E-20B03	1991	12	30	1		2290.7	17.9
ERO406	27N/44E-20B03	1992	01	07				

Ecology Ground Water Level Monitoring Record
WRIA 55 - Little Spokane River Watershed

Unique Station ID	Station Location	Date of Measurement			Water Level Measuring Point ID	Water Level Status	Water Level Elevation (feet MSL)	Water Level Depth (feet below measuring point)
		Year	Month	Day				
ERO406	27N/44E-20B03	1992	01	15	1		2290.7	17.9
ERO406	27N/44E-20B03	1992	01	22	1	R	2290.3	18.3
ERO406	27N/44E-20B03	1992	01	30	1		2290.7	17.9
ERO406	27N/44E-20B03	1992	02	05	1		2290.6	18
ERO406	27N/44E-20B03	1992	02	13	1		2291.18	17.42
ERO406	27N/44E-20B03	1992	02	25	1		2291.2	17.4
ERO406	27N/44E-20B03	1992	03	12	1		2291.46	17.14
ERO406	27N/44E-20B03	1992	03	18	1	S	2290.89	17.71
ERO406	27N/44E-20B03	1992	03	25	1	S	2289.95	18.65
ERO406	27N/44E-20B03	1992	04	01	1	S	2290.14	18.46
ERO406	27N/44E-20B03	1992	04	08	1	S	2290.07	18.53
ERO406	27N/44E-20B03	1992	04	15	1	S	2289.03	19.57
ERO406	27N/44E-20B03	1992	04	23	1	S	2290.3	18.3
ERO406	27N/44E-20B03	1992	05	06	1	S	2289.75	18.85
ERO406	27N/44E-20B03	1976	08	06				9
ERO406	27N/44E-20B03	1981	02	26	1		2289.6	19
ERO406	27N/44E-20B03	1981	03	03	1		2286.85	21.75
ERO406	27N/44E-20B03	1981	03	27	1		2291.45	17.15
ERO406	27N/44E-20B03	1981	06	23	1		2297.35	11.25
ERO406	27N/44E-20B03	1981	08	07	1		2287	21.6
ERO406	27N/44E-20B03	1981	09	24	1		2285.1	23.5
ERO406	27N/44E-20B03	1981	10	08	1		2285.35	23.25
ERO406	27N/44E-20B03	1982	03	10	1		2297.6	11
ERO406	27N/44E-20B03	1982	09	10	1		2286.1	22.5
ERO406	27N/44E-20B03	1983	04	28	1		2300.8	7.8
ERO406	27N/44E-20B03	1986	03	07	1		2301.1	7.5
ERO406	27N/44E-20B03	1986	04	23	1	R	2300.3	8.3
ERO406	27N/44E-20B03	1987	02	10	1		2298.26	10.34
ERO406	27N/44E-20B03	1987	03	16	1	S	2289.25	19.35
ERO406	27N/44E-20B03	1987	03	18	1	R	2295.9	12.7
ERO406	27N/44E-20B03	1987	03	25	1		2288.9	19.7
ERO406	27N/44E-20B03	1987	03	26	1		2297.12	11.48
ERO406	27N/44E-20B03	1987	06	19	1		2287.24	21.36
ERO406	27N/44E-20B03	1987	07	31	1		2285.41	23.19
ERO406	27N/44E-20B03	1987	10	22	1		2287.89	20.71
ERO406	27N/44E-20B03	1988	02	26	1		2292.43	16.17
ERO406	27N/44E-20B03	1988	04	07	1	S	2286	22.6
ERO406	27N/44E-20B03	1988	10	05	1		2281.93	26.67
ERO406	27N/44E-20B03	1989	03	10	1		2291.6	17
ERO406	27N/44E-20B03	1989	04	04	1		2292.6	16
ERO406	27N/44E-20B03	1991	03	19	1		2294.33	14.27
ERO406	27N/44E-20B03	1991	08	07	1	S	2283.75	24.85
ERO406	27N/44E-20B03	1991	08	21	1	S	2276.85	31.75

Ecology Ground Water Level Monitoring Record
WRIA 55 - Little Spokane River Watershed

Unique Station ID	Station Location	Date of Measurement			Water Level Measuring Point ID	Water Level Status	Water Level Elevation (feet MSL)	Water Level Depth (feet below measuring point)
		Year	Month	Day				
ERO406	27N/44E-20B03	1991	09	04	1	S	2281.54	27.06
ERO406	27N/44E-20B03	1991	09	11	1	S	2282.7	25.9
ERO406	27N/44E-20B03	1991	09	18	1	S	2282.68	25.92
ERO406	27N/44E-20B03	1991	09	25	1	S	2282.6	26
ERO406	27N/44E-20B03	1991	10	02	1	S	2283.6	25
ERO406	27N/44E-20B03	1991	10	09	1	S	2283.07	25.53
ERO406	27N/44E-20B03	1991	10	23	1	S	2283.22	25.38
ERO406	27N/44E-20B03	1991	10	31	1		2285.69	22.91
ERO406	27N/44E-20B03	1991	11	27	1		2289.85	18.75
ERO406	27N/44E-20B03	1991	12	04	1		2290.47	18.13
ERO406	27N/44E-20B03	1991	12	11	1		2290.56	18.04
ERO406	27N/44E-20B03	1991	12	30	1		2290.7	17.9
ERO406	27N/44E-20B03	1992	01	07				
ERO406	27N/44E-20B03	1992	01	15	1		2290.7	17.9
ERO406	27N/44E-20B03	1992	01	22	1	R	2290.3	18.3
ERO406	27N/44E-20B03	1992	01	30	1		2290.7	17.9
ERO406	27N/44E-20B03	1992	02	05	1		2290.6	18
ERO406	27N/44E-20B03	1992	02	13	1		2291.18	17.42
ERO406	27N/44E-20B03	1992	02	25	1		2291.2	17.4
ERO406	27N/44E-20B03	1992	03	12	1		2291.46	17.14
ERO406	27N/44E-20B03	1992	03	18	1	S	2290.89	17.71
ERO406	27N/44E-20B03	1992	03	25	1	S	2289.95	18.65
ERO406	27N/44E-20B03	1992	04	01	1	S	2290.14	18.46
ERO406	27N/44E-20B03	1992	04	08	1	S	2290.07	18.53
ERO406	27N/44E-20B03	1992	04	15	1	S	2289.03	19.57
ERO406	27N/44E-20B03	1992	04	23	1	S	2290.3	18.3
ERO406	27N/44E-20B03	1992	05	06	1	S	2289.75	18.85
ERO407	27N/44E-20H02	1982	06	23	1		2286	57
ERO407	27N/44E-20H02	1986	03	19	1		2303.6	39.4
ERO407	27N/44E-20H02	1986	04	03	1		2303.23	39.77
ERO407	27N/44E-20H02	1986	05	02	1		2302.62	40.38
ERO407	27N/44E-20H02	1986	08	01	1	P	2266.17	76.83
ERO407	27N/44E-20H02	1987	02	10	1		2299.38	43.62
ERO407	27N/44E-20H02	1987	03	16	1		2298.72	44.28
ERO407	27N/44E-20H02	1987	03	18	1		2298.8	44.2
ERO407	27N/44E-20H02	1987	03	25	1		2297.74	45.26
ERO407	27N/44E-20H02	1987	03	26	1		2298.77	44.23
ERO407	27N/44E-20H02	1987	04	07	1		2298.98	44.02
ERO407	27N/44E-20H02	1987	06	19	1	P	2273.13	69.87
ERO407	27N/44E-20H02	1987	07	31	1		2292.4	50.6
ERO407	27N/44E-20H02	1987	10	22	1		2291.41	51.59
ERO407	27N/44E-20H02	1988	02	26				
ERO407	27N/44E-20H02	1988	10	05	1	P	2275.37	67.63

Ecology Ground Water Level Monitoring Record

WRIA 55 - Little Spokane River Watershed

Unique Station ID	Station Location	Date of Measurement			Water Level Measuring Point ID	Water Level Status	Water Level Elevation (feet MSL)	Water Level Depth (feet below measuring point)
		Year	Month	Day				
ERO407	27N/44E-20H02	1989	03	10	1		2291.8	51.2
ERO407	27N/44E-20H02	1989	04	04	1		2293	50
ERO407	27N/44E-20H02	1991	03	19	1		2294.57	48.43
ERO407	27N/44E-20H02	1991	08	07	1		2290.68	52.32
ERO407	27N/44E-20H02	1991	08	21	1		2290.41	52.59
ERO407	27N/44E-20H02	1991	09	04	1		2289.75	53.25
ERO407	27N/44E-20H02	1991	09	11	1	P	2287.17	55.83
ERO407	27N/44E-20H02	1991	09	18	1		2289.44	53.56
ERO407	27N/44E-20H02	1991	09	25	1		2289.73	53.27
ERO407	27N/44E-20H02	1991	10	02				
ERO407	27N/44E-20H02	1991	10	09				
ERO407	27N/44E-20H02	1991	10	23				
ERO407	27N/44E-20H02	1991	10	31				
ERO407	27N/44E-20H02	1991	11	27				
ERO407	27N/44E-20H02	1991	12	04				
ERO407	27N/44E-20H02	1991	12	11				
ERO407	27N/44E-20H02	1991	12	30				
ERO407	27N/44E-20H02	1992	01	15	1		2291.34	51.66
ERO407	27N/44E-20H02	1992	01	22				
ERO407	27N/44E-20H02	1992	01	30				
ERO407	27N/44E-20H02	1992	02	05				
ERO407	27N/44E-20H02	1992	02	13				
ERO407	27N/44E-20H02	1992	03	12				
ERO407	27N/44E-20H02	1992	03	18				
ERO408	27N/44E-20H03	1987	06	19	1		2298.52	46.48
ERO408	27N/44E-20H03	1987	07	31	1		2294.84	50.16
ERO408	27N/44E-20H03	1987	10	22	1		2293.39	51.61
ERO408	27N/44E-20H03	1988	02	26	1		2295.33	49.67
ERO408	27N/44E-20H03	1988	04	17	1		2295	50
ERO408	27N/44E-20H03	1988	10	05	1		2289.19	55.81
ERO408	27N/44E-20H03	1989	03	10	1		2293.1	51.9
ERO408	27N/44E-20H03	1989	04	04	1		2294.5	50.5
ERO408	27N/44E-20H03	1991	03	19	1		2296.59	48.41
ERO408	27N/44E-20H03	1991	08	07	1		2292.82	52.18
ERO408	27N/44E-20H03	1991	08	21	1		2292.66	52.34
ERO408	27N/44E-20H03	1991	09	04	2		2292.08	52.92
ERO408	27N/44E-20H03	1991	09	11	2		2291.88	53.12
ERO408	27N/44E-20H03	1991	09	18	2		2291.77	53.23
ERO408	27N/44E-20H03	1991	09	25	2		2291.68	53.32
ERO408	27N/44E-20H03	1991	10	02	2		2291.67	53.33
ERO408	27N/44E-20H03	1991	10	09	2		2291.44	53.56
ERO408	27N/44E-20H03	1991	10	23	2		2291.64	53.36
ERO408	27N/44E-20H03	1991	10	31	2		2291.46	53.54

Ecology Ground Water Level Monitoring Record
WRIA 55 - Little Spokane River Watershed

Unique Station ID	Station Location	Date of Measurement Year	Month	Day	Water Level Measuring Point ID	Water Level Status	Water Level Elevation (feet MSL)	Water Level Depth (feet below measuring point)
ERO408	27N/44E-20H03	1991	11	27	2		2292.8	52.2
ERO408	27N/44E-20H03	1991	12	04	2		2293	52
ERO408	27N/44E-20H03	1991	12	11	2		2293.23	51.77
ERO408	27N/44E-20H03	1991	12	30	2		2293.25	51.75
ERO408	27N/44E-20H03	1992	01	07	2		2293.19	51.81
ERO408	27N/44E-20H03	1992	01	15	2		2293.23	51.77
ERO408	27N/44E-20H03	1992	01	22	2		2293.15	51.85
ERO408	27N/44E-20H03	1992	01	30	2		2293.35	51.65
ERO408	27N/44E-20H03	1992	02	05	2		2293.42	51.58
ERO408	27N/44E-20H03	1992	02	13	2		2293.91	51.09
ERO408	27N/44E-20H03	1992	02	25	2		2293.45	51.55
ERO408	27N/44E-20H03	1992	03	12	2		2293.33	51.67
ERO408	27N/44E-20H03	1992	03	18	2		2293.79	51.21
ERO408	27N/44E-20H03	1992	03	25	2		2293.75	51.25
ERO408	27N/44E-20H03	1992	04	01	2		2293.78	51.22
ERO408	27N/44E-20H03	1992	04	08	2		2293.74	51.26
ERO408	27N/44E-20H03	1992	04	15	2		2293.65	51.35
ERO408	27N/44E-20H03	1992	04	23	2		2293.52	51.48
ERO408	27N/44E-20H03	1992	05	06	2		2293.47	51.53
ERO409	27N/44E-29H01	1984	05	04	1		2295	59
ERO409	27N/44E-29H01	1985	11	11	1		2285.6	68.4
ERO409	27N/44E-29H01	1987	03	18	1		2283.77	70.23
ERO409	27N/44E-29H01	1987	07	31	1		2275.9	78.1
ERO409	27N/44E-29H01	1987	10	22	1		2272.06	81.94
ERO409	27N/44E-29H01	1988	02	26	1		2277.2	76.8
ERO409	27N/44E-29H01	1988	08	09	1		2268.25	85.75
ERO409	27N/44E-29H01	1988	10	05	1		2265.23	88.77
ERO409	27N/44E-29H01	1989	04	04	1		2272.7	81.3
ERO409	27N/44E-29H01	1991	03	19	1		2274.87	79.13
ERO409	27N/44E-29H01	1991	08	07	1			
ERO409	27N/44E-29H01	1991	08	21	1			
ERO409	27N/44E-29H01	1991	10	02	1			
ERO409	27N/44E-29H01	1991	11	27	1		2272.91	81.09
ERO409	27N/44E-29H01	1991	12	04	1		2273.24	80.76
ERO409	27N/44E-29H01	1991	12	11	1		2273.44	80.56
ERO409	27N/44E-29H01	1991	12	30	1		2273.3	80.7
ERO409	27N/44E-29H01	1992	01	07	1		2273.25	80.75
ERO409	27N/44E-29H01	1992	01	15	1		2273.6	80.4
ERO409	27N/44E-29H01	1992	01	22	1			
ERO409	27N/44E-29H01	1992	01	30	1			
ERO409	27N/44E-29H01	1992	02	05	1		2273.6	80.4
ERO409	27N/44E-29H01	1992	02	13	1		2273.87	80.13
ERO409	27N/44E-29H01	1992	02	25	1		2273.63	80.37

Ecology Ground Water Level Monitoring Record
WRIA 55 - Little Spokane River Watershed

Unique Station ID	Station Location	Date of Measurement			Water Level Measuring Point ID	Water Level Status	Water Level Elevation (feet MSL)	Water Level Depth (feet below measuring point)
		Year	Month	Day				
ERO409	27N/44E-29H01	1992	03	12	1		2273.41	80.59
ERO409	27N/44E-29H01	1992	03	18	1		2273.53	80.47
ERO409	27N/44E-29H01	1992	03	25	1		2273.84	80.16
ERO409	27N/44E-29H01	1992	04	01	1		2274.05	79.95
ERO409	27N/44E-29H01	1992	04	08	1		2273.94	80.06
ERO409	27N/44E-29H01	1992	04	15	1		2273.89	80.11
ERO409	27N/44E-29H01	1992	04	23	1		2273.7	80.3
ERO409	27N/44E-29H01	1992	05	06	1		2273.62	80.38
ERO410	27N/44E-29A01	1987	01	09	1		2079	228
ERO410	27N/44E-29A01	1987	07	31	1		2072.75	234.25
ERO410	27N/44E-29A01	1987	10	22	1	R	2001	306
ERO410	27N/44E-29A01	1988	02	26	1		2076.12	230.88
ERO410	27N/44E-29A01	1988	10	05	1	P	2023.4	283.6
ERO410	27N/44E-29A01	1989	04	04	1		2076.5	230.5
ERO410	27N/44E-29A01	1991	03	19	1		2077.02	229.98
ERO410	27N/44E-29A01	1991	08	07	1	P		
ERO410	27N/44E-29A01	1991	08	21	1	P		
ERO410	27N/44E-29A01	1991	09	11	1		2005.5	301.5
ERO410	27N/44E-29A01	1991	09	18	1		2061.79	245.21
ERO410	27N/44E-29A01	1991	09	25	1	P		
ERO410	27N/44E-29A01	1991	10	02	1	P		
ERO410	27N/44E-29A01	1991	10	09	1	P		
ERO410	27N/44E-29A01	1991	10	23	1	P		
ERO410	27N/44E-29A01	1991	10	31	1	P		
ERO410	27N/44E-29A01	1991	11	27	1	P	1989.46	317.54
ERO410	27N/44E-29A01	1991	12	04	1		2071.25	235.75
ERO410	27N/44E-29A01	1991	12	11	1		2073.67	233.33
ERO410	27N/44E-29A01	1991	12	30	1		2075	232
ERO410	27N/44E-29A01	1992	01	07	1		2075.61	231.39
ERO410	27N/44E-29A01	1992	01	15	1		2075.6	231.4
ERO410	27N/44E-29A01	1992	01	22	1		2075.6	231.4
ERO410	27N/44E-29A01	1992	01	30	1		2075.83	231.17
ERO410	27N/44E-29A01	1992	02	05	1		2075.85	231.15
ERO410	27N/44E-29A01	1992	02	13	1		2076.44	230.56
ERO410	27N/44E-29A01	1992	02	25	1		2076.12	230.88
ERO410	27N/44E-29A01	1992	03	12	1			
ERO410	27N/44E-29A01	1992	03	18	1		2076.2	230.8
ERO410	27N/44E-29A01	1992	03	25	1		2074.87	232.13
ERO410	27N/44E-29A01	1992	04	01	1			
ERO427	30N/43E-26M	1993	07	01	1			
ERO427	30N/43E-26M	1994	09	26	1			
ERO427	30N/43E-26M	1994	10	05	1			

Ecology Ground Water Level Monitoring Record
WRIA 55 - Little Spokane River Watershed

Unique Station ID	Station Location	Date of Measurement			Water Level Measuring Point ID	Water Level Status	Water Level Elevation (feet MSL)	Water Level Depth (feet below measuring point)
		Year	Month	Day				
ERO427	30N/43E-26M	1994	11	14	1			
ERO427	30N/43E-26M	1994	11	16	1			
ERO427	30N/43E-26M	1994	11	21	1			
ERO427	30N/43E-26M	1994	11	28	1			
ERO427	30N/43E-26M	1994	12	09	1			
ERO427	30N/43E-26M	1994	12	22	1			
ERO427	30N/43E-26M	1994	12	29	1			

Appendix A.4 *Chapter 173-555 WAC, Water Resources Program in the Little Spokane Watershed, WRIA 55 and Summary of Compliance with Instream Flow Requirements*

Chapter 173-555 WAC
WATER RESOURCES PROGRAM IN THE LITTLE SPOKANE RIVER BASIN, WRIA 55

WAC 173-555-010 General provision. These rules, including any subsequent additions and amendments, apply to waters within and contributing to the Little Spokane River basin, WRIA-55 (see WAC 173-500-040). Chapter 173-500 WAC, the general rules of the department of ecology for the implementation of the comprehensive water resources program, applies to this chapter 173-555 WAC.

[Order DE 75-24, § 173-555-010, filed 1/6/76.]

WAC 173-555-020 Definition. "NONCOMMERCIAL AGRICULTURAL IRRIGATION" means beneficial use of water upon not more than three acres for the purpose of crops and livestock for domestic use.

[Order DE 75-24, § 173-555-020, filed 1/6/76.]

WAC 173-555-030 Establishment of base flows. (1) Base flows are established for stream management units with monitoring to take place at certain control points as follows:

Stream Management Unit Information

Control Station Number, Stream Management Unit Name	Control Station Location by River Mile and Section, Township Range	Affected Stream Reach
No. 12-4270.00 Little Spokane River Elk	34.6 Sec. 8, T.29N., R.43 E.W.M.	From confluence with Dry Creek to the headwaters including tributaries except Dry Creek.
No. 12-4295.00 Little Spokane River Chattaroy	23.05 Sec. 34, T.28N., R.43 E.W.M.	From confluence with Deer Creek to confluence with Dry Creek including tributaries except Deer Creek.
No. 12-4310.00 Little Spokane River Dartford	10.8 Sec. 6, T.26N., R.43 E.W.M.	From confluence with Little Creek to confluence with Deer Creek including tributaries except Little Creek.
No. 12-4315.00 Little Spokane River Confluence	3.9 Sec. 3, T.26N., R.42 E.W.M.	From mouth to confluence with Little Creek including tributaries.

(2) Base flows established for the stream management units in WAC 173-555-030(1) are as follows:

Base Flows in the Little Spokane River Basin
(in Cubic Feet Per Second)

Month	Day	12-4270.00 Elk	12-4295.00 Chattaroy	12-4310.00 Dartford	12-4315.00 Confluence
Jan.	1	40	86	150	400
	15	40	86	150	400
Feb.	1	40	86	150	400
	15	43	104	170	420
Mar.	1	46	122	190	435
	15	50	143	218	460
Apr.	1	54	165	250	490
	15	52	143	218	460
May	1	49	124	192	440
	15	47	104	170	420
Jun.	1	45	83	148	395
	15	43	69	130	385
Jul	1	41.5	57	115	375
	15	39.5	57	115	375
Aug.	1	38	57	115	375
	15	38	57	115	375
Sept.	1	38	57	115	375
	15	38	63	123	380
Oct.	1	38	70	130	385
	15	39	77	140	390
Nov.	1	40	86	150	400
	15	40	86	150	400
Dec.	1	40	86	150	400
	15	40	86	150	400

(3) Base Flow hydrographs, Figure II-1 in the document entitled "water resources management program in the Little Spokane River Basin" dated August, 1975 shall be used for definition of base flows on those days not specifically identified in WAC 173-555-030(2).

(4) All rights hereafter established shall be expressly subject to the base flows established in sections WAC 173-555-030 (1) through (3).

[Order DE 75-24, § 173-555-030, filed 1/6/76.]

WAC 173-555-040 Future allocations—Reservation of surface water for beneficial uses. (1) The department determines that these are surface waters available for appropriation from the stream management units specified in the amount specified in cubic feet per second (cfs) during the time specified as follows:

(a) Surface water available from the east branch of the Little Spokane River, confluence with Dry Creek to headwaters, based on measurement at control station number 12-4270.00 at Elk are:

Month	May		June		July		Aug.		Sept.		Oct.	
Date	1	15	1	15	1	15	1	15	1	15	1	15
Amount	26	22	17	14	11	9	5	5	5	5	7	7

(b) Surface water available from the Little Spokane River from confluence with Little Creek at Dartford to Eloika Lake outlet, and to confluence with Dry Creek based on measurement at control station number 12-4310 at Dartford are:

Month	May		June		July		Aug.		Sept.		Oct.	
Date	1	15	1	15	1	15	1	15	1	15	1	15
Amount	340	236	152	103	62	34	11	11	11	11	20	20

(c) Available surface waters for those days not specified in (a) and (b) shall be defined from Figures II-3 and II-4 in the document entitled "water resources management program in the Little Spokane River basin" dated August, 1975.

(2) The amounts of waters referred to in WAC 173-555-040(1) above are allocated for beneficial uses in the future as follows:

(a) Three cubic feet per second from the amount available in the east branch of the Little Spokane River referred to in WAC 173-555-040 (1)(a) above and five cubic feet per second from the amount available in the Little Spokane River, besides east branch, referred to in WAC 173-555-040 (1)(b) are allocated to future domestic, stockwatering and noncommercial agricultural irrigation purposes within the stream reaches specified therein throughout the year.

(b) The remainder of the amount referred to in WAC 173-555-040 (1)(a) and (b) besides the amount specified in WAC 173-555-040 (2)(a) are allocated to consumptive and nonconsumptive uses not specified in WAC 173-555-040 (2)(a). These are further described in the figures appended hereto.

[Order DE 75-24, § 173-555-040, filed 1/6/76.]

WAC 173-555-050 Priority of future water rights during times of water shortage. (1) As between rights established in the future pertaining to waters allocated in WAC 173-555-040 (2)(a) and (b), all rights established in (a) shall be superior to those pertaining to (b) regardless of the date of the priority of right.

(2) As between rights established in the future within a single use category allocation of WAC 173-555-040, the date of priority shall control with an earlier dated right being superior to those rights with later dates.

[Order DE 75-24, § 173-555-050, filed 1/6/76.]

WAC 173-555-060 Streams and lakes closed to further consumptive appropriations. The department, having determined there are no waters available for further appropriation through the establishment of rights to use water consumptively, closes the following streams to further consumptive appropriation except for domestic and normal stockwatering purposes excluding feedlot operation:

SURFACE WATER CLOSURES

Stream* Name	Affected Reach	Date of Closure	Period of Closure
Dry Creek	Mouth to headwaters	5-26-1952	1 June-31 Oct.
Otter Creek	Mouth to headwaters	2-23-1971	"
Bear Creek	Mouth to headwaters	4-13-1953	"
Deer Creek	Mouth to headwaters	2-29-1968	"
Dragoon Creek	Mouth to headwaters	7-02-1951	"
Deep Creek	Mouth to headwaters	6-14-1961	"
Deadman Creek[1/]	Mouth to headwaters	11-28-1961	"
Little Creek	Mouth to headwaters	4-13-1953	"
W. Branch Little Spokane River	Outlet of Eloika Lake to headwaters	Date of adoption	"
All natural lakes in the basin		"	"

* Includes all tributaries in the contributing drainage area unless specifically excluded.

1/ An unnamed tributary flowing through Sec. 20, T26N., R.44E. is exempted from closure.

[Order DE 75-24, § 173-555-060, filed 1/6/76.]

WAC 173-555-070 Effect on prior rights. Nothing in this chapter shall be construed to lessen, enlarge or modify the existing rights acquired by appropriation or otherwise.

[Order DE 75-24, § 173-555-070, filed 1/6/76.]

WAC 173-555-080 Enforcement. In enforcement of this chapter, the department of ecology may impose such sanctions as are appropriate under authorities vested in it, including but not limited to the issuance of regulatory orders under RCW 43.27A.190 and civil penalties under RCW 90.03.600.

[Statutory Authority: Chapters 43.27A, 90.22 and 90.54 RCW. 88-13-037 (Order 88-11), § 173-555-080, filed 6/9/88.]

WAC 173-555-090 Appeals. All final written decisions of the department of ecology pertaining to permits, regulatory orders, and related decisions made pursuant to this chapter shall be subject to review by the pollution control hearings board in accordance with chapter 43.21B RCW.

[Statutory Authority: Chapters 43.27A, 90.22 and 90.54 RCW. 88-13-037 (Order 88-11), § 173-555-090, filed 6/9/88.]

WAC 173-555-100 Regulation review. The department of ecology shall initiate a review of the rules established in this chapter whenever new information, changing conditions, or statutory modifications make it necessary to consider revisions

[Statutory Authority: Chapters 43.27A, 90.22 and 90.54 RCW. 88-13-037 (Order 88-11), § 173-555-100, filed 6/9/88.]

Chapter 173-559 WAC

WATER RESOURCES PROGRAM FOR THE COLVILLE RIVER BASIN, WRIA-59

WAC 173-559-010 Purpose. This regulation is adopted in accordance with the water resources management regulation, chapter 173-500 WAC, which was promulgated under the authority of the Water Resources Act of 1971, chapter 90.54 RCW. This chapter, including any amendments, applies to all waters that lie within or contribute to the Colville River drainage basin. This chapter sets forth the department's policies to manage the basin's water resources.

[Order DE 77-6, § 173-559-010, filed 7/22/77.]

WAC 173-559-020 Definitions. For purposes of this chapter, the following definitions shall be used.

(1) "Allocation" means the designating of specific amounts of the water resource for specific beneficial uses.

(2) "Base flow" means a level of stream flow established in accordance with provisions of chapter 90.54 RCW required in perennial streams to preserve wildlife, fish, scenic, aesthetic, and other environmental and navigational values.

(3) "Consumptive use" means use of water, whereby there is diminishment of the water resources.

(4) "Department" means the Washington state department of ecology.

(5) "Director" means the director of the department of ecology.

(6) "Domestic use" means use of water associated with human health and welfare requirements, including water used for drinking, bathing, sanitary purposes, cooking, laundering, irrigation of not over one-half acre of lawn and garden per dwelling, and other incidental household uses.

(7) "Hydrograph" is a graph showing the variation of streamflow (or stream discharge) with respect to time during a year as determined at a specific cross-sectional location on the stream.

(8) "In-house domestic use" means use of water for drinking, cleaning, sanitation, and other uses in a residence, excluding irrigation of lawn and garden.

(9) "Nonconsumptive use" means a type of water use where either there is no diversion from a source body, or where there is no diminishment of the source.

(10) "Perennial stream" means a stream with a natural flow which is normally continuous at any given location.

(11) "Reservoir permit" means a water right permit which authorizes construction of an impoundment structure, storage of water and generally the use of water in the amount of one filling annually.

(12) "Secondary permit" means a water right permit which allows diversion of water for beneficial use from a storage reservoir. A secondary permit is necessary only for use in excess of one filling annually, or for diversion and use by a party other than the reservoir owner.

(13) "Stream management unit" means a stream segment, reach, or tributary, containing a control station, that is identified on a stream reach map in an adopted water resource management program document as a unit for defining base flow levels.

(14) "Water right" means a right to make beneficial use of public waters of the state.

[Order DE 77-6, § 173-559-020, filed 7/22/77.]

WAC 173-559-030 Establishment of base flows. RCW 90.54.020 requires that perennial rivers and streams shall be retained with base flows necessary to provide for preservation of wildlife, fish, scenic, aesthetic, and other environmental values and navigational values. Under this provision, base flows for stream management units of a basin are established which describe discharge rates at stream measurement stations in each unit. The following subsections, WAC 173-559-030(1) through (4), establish these requirements for WRIA 59:

(1) In the Colville River basin, monitoring of base flows will take place at the following control points:

Table 1

Stream Management Units

Stream Management Unit and Control Station Number	Control Station Location by River-Mile, and Section Township and Range	Stream Management Reach
Upper Colville River No. 12.4080.00	32.1 Sec. 31, T. 33 N., R. 40 E.W.M.	Colville River from confluence with Stensgar Creek to confluence of Sheep Creek and Deer Creek.
Lower Colville River No. 12.4090.00	5.0 Sec. 29, T. 36 N., R. 38 E.W.M.	Colville River from confluence with Lake Roosevelt to confluence with Stensgar Creek.

(2) In the Colville River basin, base flows for the stream management units in WAC 173-559-030(1) are set in Table 2 as follows:

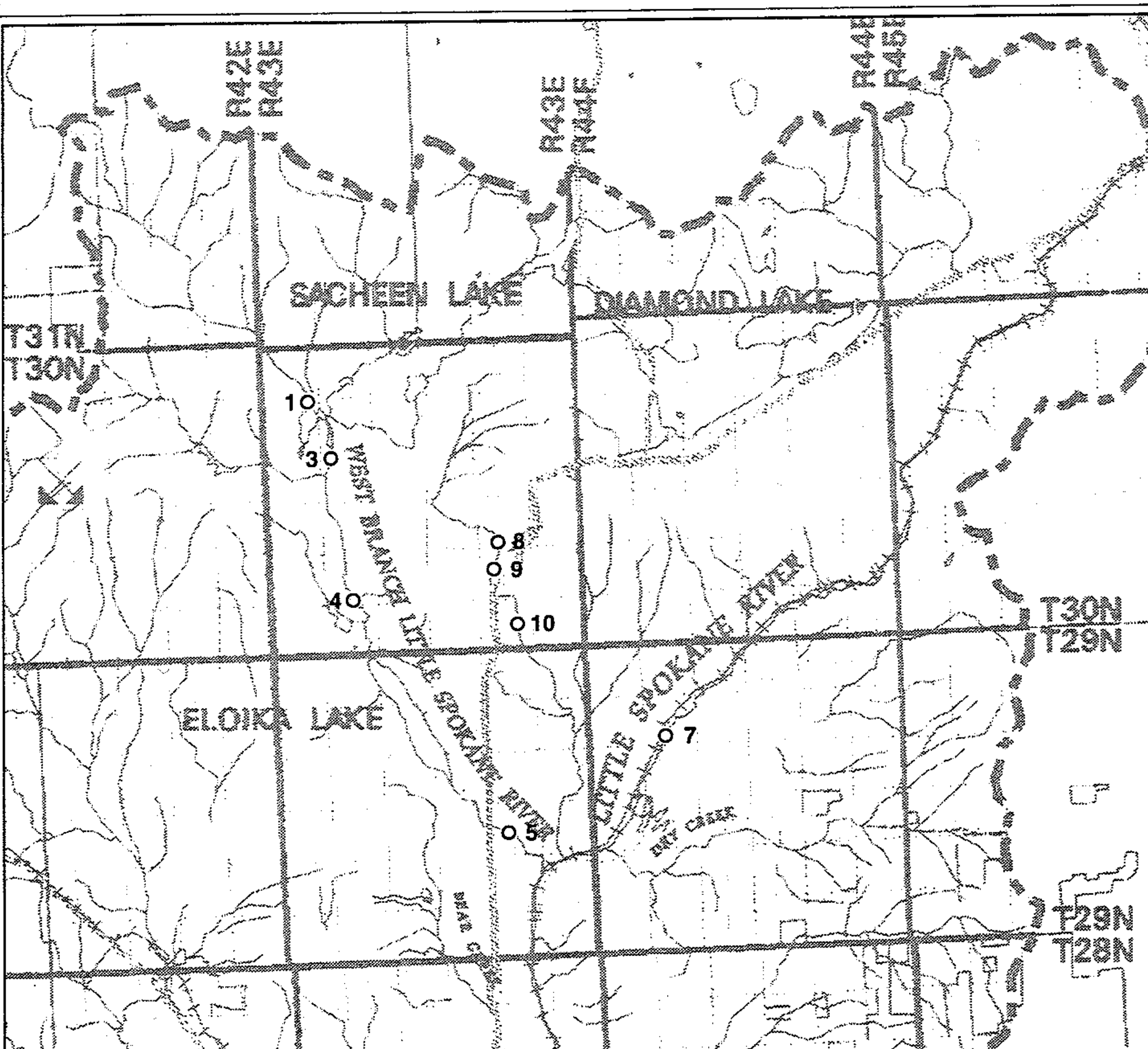
Streamflow - Little Spokane River at Dartford, WA
Total Number of Days Flows are below Instream Flow Requirements

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1928	---	---	---	---	---	---	---	---	---	---	---	---	0
1929	---	---	---	---	17	11	11	28	30	31	30	14	172
1930	31	7	28	30	31	27	30	31	30	31	30	31	337
1931	23	17	3	25	31	30	31	31	30	31	30	17	299
1932	4	11	0	0	0	0	8	28	28	---	---	---	79
1946	---	---	---	---	---	---	---	---	---	---	---	---	0
1947	0	0	0	0	8	2	22	24	5	---	---	---	61
1948	0	0	0	0	0	0	0	0	0	0	0	0	0
1949	0	0	0	0	0	0	0	0	0	0	0	0	0
1950	7	4	0	0	0	0	0	0	0	0	0	0	11
1951	0	0	0	0	0	0	0	0	0	0	0	0	0
1952	0	0	0	0	0	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0	0	0	0	0	0
1955	0	1	3	0	0	0	0	0	0	0	2	0	6
1956	0	0	0	0	0	0	0	0	0	0	0	0	0
1957	7	5	0	0	0	0	0	0	0	0	0	0	12
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	2	0	0	0	0	0	0	0	0	0	1	0	3
1960	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0	0	0	1	1
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	1	0	0	0	0	0	0	0	0	0	0	1	2
1964	1	0	0	0	0	0	0	0	0	0	0	1	2
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	5	25	4	14	10	0	58
1967	0	0	0	0	0	0	0	10	3	5	0	2	20
1968	1	0	0	0	2	4	27	18	0	2	0	1	55
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	1	0	0	0	0	0	0	0	0	0	0	1	2
1971	0	0	0	0	0	0	0	0	0	0	0	1	1
1972	1	0	0	0	0	0	0	0	0	0	1	14	16
1973	0	0	0	13	10	24	31	31	19	11	8	0	147
1974	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	6	0	16	30	31	21	31	30	19	29	13	0	226
1978	0	0	0	0	0	0	0	0	0	9	24	21	54
1979	31	8	0	0	0	12	22	31	16	26	29	3	178
1980	12	3	0	0	0	0	3	28	10	29	8	0	93
1981	0	0	0	0	0	0	0	20	13	0	0	0	33
1982	1	0	0	0	0	0	0	0	0	0	0	0	1
1983	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	4	5	0	0	3	3	15
1986	2	0	0	0	0	0	0	24	0	0	0	0	26
1987	6	0	0	0	0	3	0	2	0	17	12	3	43
1988	3	1	0	0	5	0	10	31	28	31	6	1	116
1989	0	3	4	0	0	0	11	22	23	27	11	4	105
1990	3	0	0	0	0	0	0	0	16	23	0	13	55
1991	6	0	0	0	0	0	0	0	19	31	8	0	64
1992	0	0	1	30	4	---	---	---	---	---	---	---	35

Appendix A.5 Department of Ecology Discrete Stream Flow Measurements and Location of Monitoring Points

Appendix A.5

This appendix presents Ecology's discrete stream flow measurements at 48 sites within WRIA 60. These discrete measurements were generally collected monthly between May and September in between 1986 through 1990. A map indication station locations is also provided in this appendix.



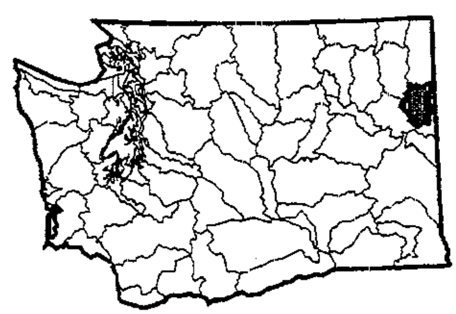
DISCRETE STREAM GAGING LOCATIONS
DEPARTMENT OF ECOLOGY

LEGEND

○ Approximate location and station number

● Extreme low or zero flow measured where solid

See database for stream flow measurements



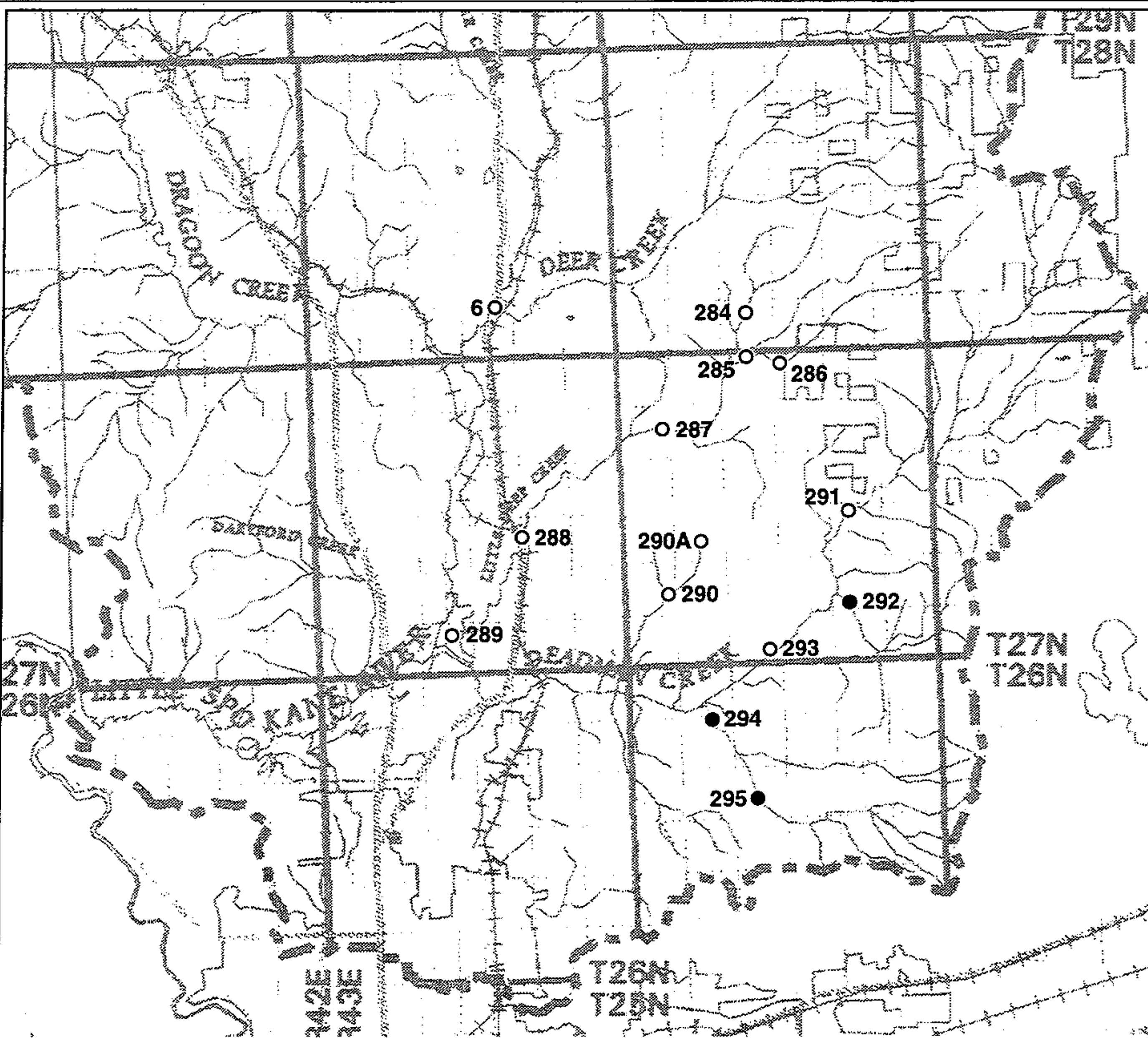
NORTH HALF OF LITTLE SPOKANE (WRIA 55)

Washington Department of Ecology

0 5
Scale in Miles

APPENDIX A.5

Watershed Assessment



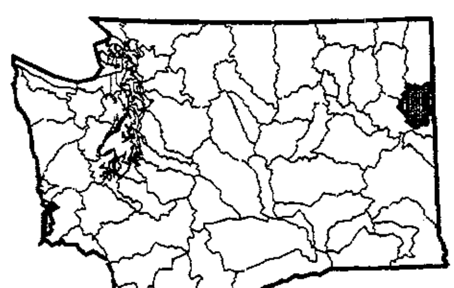
DISCRETE STREAM GAGING LOCATIONS
DEPARTMENT OF ECOLOGY

LEGEND

○ Approximate location and station number

● Extreme low or zero flow measured where solid

See database for stream flow measurements



SOUTH HALF OF LITTLE SPOKANE (WRIA 55)

APPENDIX A.5

Washington Department of Ecology

Watershed Assessment

0 5

Scale in Miles

07927_13.CDR

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	7/9/86	1.7100	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	8/7/86	4.1800	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	9/11/86	1.6000	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	4/4/87	28.8000	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	5/31/87	9.1100	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	6/22/87	2.6300	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	7/15/87	1.5600	Control built since last meas.
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	7/29/87	1.7100	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	8/18/87	1.8100	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	9/16/87	0.7100	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	11/8/87	1.1300	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	5/22/88	4.8600	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	6/9/88	10.3000	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	6/27/88	5.4100	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	7/11/88	2.7900	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	7/26/88	1.6000	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	8/16/88	0.9900	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	8/29/88	0.7800	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	9/8/88	0.6500	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	9/25/88	1.3500	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	6/13/89	8.2300	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	6/28/89	4.7800	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	7/11/89	3.8900	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	7/26/89	2.2300	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	8/9/89	1.9800	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	8/30/89	2.1200	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	9/12/89	1.4300	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	9/27/89	1.3100	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	6/7/90	56.7000	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	6/19/90	33.1000	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	7/2/90	11.3000	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	7/24/90	5.2600	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	8/8/90	2.5700	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	8/22/90	4.7700	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	9/12/90	1.7000	
00001	55	PO	Buck Creek	Horseshoe Lake	30	43	06	SW SE SE	near bridge	Fan Lake	10/20/90	2.0400	

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	7/9/86	0.8500	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	8/7/86	0.5500	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	9/11/86	0.2000	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	4/4/87	7.2900	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	5/26/87	1.0000	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	6/22/87	0.3600	Sloping Rock Edge @ LEW
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	7/15/87	0.2500	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	7/29/87	0.2700	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	9/1/87	0.1800	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	9/16/87	0.1800	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	11/8/87	0.2100	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	5/22/88	0.4500	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	6/9/88	3.9300	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	6/27/88	0.5900	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	7/11/88	0.4600	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	7/26/88	0.2600	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	8/16/88	0.2200	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	8/29/88	0.1900	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	9/8/88	0.2000	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	9/25/88	0.2400	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	6/13/89	1.4100	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	6/28/89	0.4000	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	7/11/89	0.3200	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	7/26/89	0.2400	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	8/9/89	0.2800	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	8/30/89	0.2400	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	9/12/89	0.2100	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	9/27/89	0.2000	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	6/7/90	25.8000	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	6/19/90	12.0000	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	7/2/90	2.8400	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	7/24/90	0.7900	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	8/8/90	0.4500	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	8/22/90	0.6600	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	9/12/90	0.4400	
00002	55	PO	Beaver Creek	W.B. Little Spokane River	30	43	18	NW NW SE	@ road	Fan Lake	10/20/90	0.9400	

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	9/11/86	2.0800	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	5/31/87	28.1000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	6/22/87	12.8000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	7/15/87	10.6000	Veg. @ LEW
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	7/29/87	16.5000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	9/1/87	6.5000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	9/16/87	3.2000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	5/22/88	16.4000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	6/9/88	49.6000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	6/27/88	20.4000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	7/11/88	15.1000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	7/26/88	4.6100	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	8/16/88	2.6400	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	8/29/88	1.9000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	9/8/88	1.7300	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	9/25/88	1.9000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	6/13/89	23.8000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	6/28/89	14.8000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	7/11/89	18.5000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	7/26/89	9.0600	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	8/9/89	9.0000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	8/30/89	14.8000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	9/12/89	11.5300	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	9/27/89	6.3300	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	6/7/90		Too swift to measure
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	6/19/90		Too swift to measure
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	7/2/90	37.8000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	7/24/90	19.8000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	8/8/90	23.1000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	8/21/90	20.4000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	9/12/90	10.2000	
00003	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	17	N2 SW NW	access road	Fan Lake	10/20/90	10.2000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	9/11/86	3.1200	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	5/26/87	21.6000	

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	6/22/87	12.2000	Heavy Veg. @ REW & LEW
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	7/29/87	18.0000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	9/1/87	6.9600	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	5/22/88	18.5000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	6/9/88	52.8000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	6/27/88	23.9000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	7/11/88	16.2000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	7/26/88	5.7300	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	8/16/88	3.2200	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	8/29/88	3.0900	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	9/8/88	2.8200	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	9/25/88	3.7100	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	6/13/89	26.7000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	6/28/89	16.4000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	7/11/89	19.6000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	7/26/89	10.1300	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	8/9/89	10.3000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	8/30/89	16.2000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	9/12/89	12.7000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	9/27/89	6.8900	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	6/7/90		Too swift to measure
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	6/19/90		Too swift to measure
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	7/2/90	49.7000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	7/24/90	19.5000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	8/8/90	24.0000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	8/22/90	25.1000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	9/12/90	13.4000	
00004	55	PO	W.B. Little Spokane River	Little Spokane River	30	43	32	NE NW NE	@ road (2 culverts)	Fan Lake	10/20/90	11.4000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	9/11/86	6.6300	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	7/23/87	15.5000	Veg. @ LEW
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	9/1/87	10.9000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	5/22/88	30.4000	Heavy Veg.@ LEW & REW

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	6/9/88	49.4000	Heavy Veg.@ LEW & REW
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	6/27/88	33.6000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	7/11/88	17.5000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	7/26/88	9.0800	Heavy Veg.@ LEW
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	8/16/88	0.9700	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	8/29/88	0.8100	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	9/8/88	0.4800	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	9/30/88	2.1400	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	6/13/89	38.3000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	6/28/89	25.2000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	7/11/89	25.2000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	7/26/89	13.2000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	8/9/89	5.2100	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	8/30/89	9.5900	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	9/12/89	10.4000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	9/27/89	7.6200	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	5/25/90	77.6000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	6/7/90	200.0000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	6/19/90	153.0000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	7/2/90	109.0000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	7/24/90	26.2000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	8/8/90	27.6000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	8/22/90	28.3000	
00005	55	SP	W.B. Little Spokane River	Little Spokane River	29	43	23	SW SW NW	@ bridge (Toner's)	Chattaroy	9/12/90	19.3000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	6/22/87	86.6000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	7/15/87	58.9000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	7/27/87	64.0000	RP=11.85
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	8/3/87	56.9000	RP=11.85
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	8/10/87	52.8000	RP=11.9
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	8/17/87	62.1000	RP=11.85
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	8/31/87	49.3000	RP=11.9
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	9/8/87	53.1000	RP=11.92
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	9/14/87	51.9000	RP=11.93
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	9/21/87	52.8000	RP=11.92
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	10/13/87	63.8000	

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	10/21/87	60.0000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	5/22/88	81.9000	RP=11.75ft
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	6/9/88	108.0000	RP=11.6ft
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	6/27/88	81.1000	RP=11.75ft
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	7/11/88	64.2000	RP=11.85ft
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	7/26/88	50.4000	RP=12.00ft - pump running upst
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	8/16/88	41.6000	RP=12.1 ft
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	8/29/88	42.5000	RP=12.1 ft
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	9/8/88	42.6000	RP=12.1 ft
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	9/30/88	48.6000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	6/13/89	92.1000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	6/28/89	71.5200	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	7/11/89	64.8000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	7/17/89	64.6000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	7/26/89	52.9700	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	8/1/89	47.1000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	8/9/89	48.7000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	8/16/89	48.6000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	8/21/89	51.5000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	8/30/89	58.4000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	9/7/89	58.6000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	9/12/89	60.0000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	9/22/89	58.6000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	9/28/89	58.7200	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	6/7/90		Too swift to measure RP=10.7'
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	6/19/90		Too swift to measure RP=10.9'
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	7/2/90	129.0000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	7/24/90	77.2000	RP=11.7'
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	8/8/90	66.6000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	8/22/90	78.5000	
00006	55	SP	Little Spokane River	Spokane River	28	43	27	SW SW SE	@ bridge	Chattaroy	9/12/90	65.7000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	7/2/87	35.3000	

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	7/27/87	39.8000	Heavy Veg.@ LEW
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	8/3/87	36.0000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	8/10/87	31.8000	Veg.@ LEW & REW
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	8/17/87	36.7000	Veg.@ LEW
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	8/31/87	33.4000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	9/8/87	32.0000	Veg.@ LEW
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	9/14/87	33.2000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	9/21/87	33.2000	Heavy Veg.@ LEW & REW
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	5/22/88	34.7000	approx.28 spr.running 1/4 upst
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	6/9/88	38.4000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	6/27/88	35.5000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	7/11/88	35.6000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	7/26/88	31.8000	Gage 1.89'
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	8/16/88	25.8000	Gage 2.26'-15 spr upstrm
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	8/29/88	31.7000	Gage 1.58'
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	9/8/88	29.2000	Gage 1.62'
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	9/25/88	25.5000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	6/13/89	39.1900	

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	6/28/89	39.2000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	7/11/89	34.8000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	7/17/89	37.2000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	7/26/89	32.9000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	8/1/89	31.0000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	8/9/89	38.5000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	8/16/89	33.8000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	8/21/89	36.4000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	8/30/89	36.8200	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	9/7/89	32.7000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	9/12/89	33.1000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	9/22/89	31.1000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	9/27/89	34.9500	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	6/7/90	54.6000	gage 1.97'
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	6/19/90	47.5000	gage 1.86'
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	7/2/90	41.9000	gage 1.80'
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	7/24/90	42.3000	gage 1.66'
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	8/8/90	37.3000	

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	8/22/90	45.6000	
00007	55	SP	Little Spokane River	Spokane River	29	44	08	SW NW SE	@ GS gage near Elk, Wa	Elk	9/12/90	35.3000	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	6/9/88	1.6500	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	6/28/88	0.8400	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	7/12/88	0.5800	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	7/27/88	0.3500	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	8/17/88	0.2060	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	8/30/88	0.1880	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	9/8/88	0.1550	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	5/7/89	2.1800	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	6/12/89	1.1800	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	6/27/89	0.8800	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	7/11/89	0.6500	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	7/27/89	0.5300	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	8/8/89	0.4200	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	8/29/89	0.4700	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	9/11/89	0.4000	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	9/27/89	0.3600	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	10/24/89	0.5400	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	4/28/90	5.0800	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	6/7/90	5.2200	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	6/19/90	2.9700	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	7/2/90	1.8000	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	7/24/90	1.4000	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	8/8/90	0.9600	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	8/22/90	0.9700	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	9/12/90	0.6900	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	5/10/91	2.7400	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	6/2/91	2.0700	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	6/25/91	1.6250	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	7/11/91	1.0190	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	7/24/91	0.8050	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	8/5/91	0.6570	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	9/11/91	0.3280	
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	10/5/91	0.3700	

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00008	55	PO	Otter Creek	Little Spokane River	30	43	26	NE NE NW	@ highway	Elk	10/25/91	0.6080	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	6/9/88	1.1400	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	6/28/88	0.7100	Heavy Veg.@ LEW & REW
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	7/12/88	0.4900	Veg.@ LEW & REW
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	7/27/88	0.3400	Veg.@ LEW & REW
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	8/17/88	0.2230	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	8/30/88	0.1160	Veg.@ LEW & REW
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	9/8/88	0.0310	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	5/7/89	1.5400	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	6/12/89	0.9800	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	6/27/89	0.6700	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	7/11/89	0.4800	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	7/27/89	0.5800	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	8/8/89	0.2900	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	8/29/89	0.4400	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	9/11/89	0.2300	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	9/27/89	0.2200	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	10/24/89	0.5400	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	5/25/90	2.6500	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	6/7/90	3.7400	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	6/19/90	2.5800	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	7/2/90	1.9600	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	7/24/90	1.4100	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	8/8/90	0.9900	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	8/22/90	1.1100	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	9/12/90	0.6500	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	5/10/91	2.6900	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	6/2/91	1.6200	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	6/25/91	1.2130	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	7/11/91	1.0780	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	7/24/91	0.7990	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	8/5/91	0.5550	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	9/11/91	0.2530	

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	Location TO	RA	SE	QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	10/5/91	0.2930	
00009	55	PO	Otter Creek	Little Spokane River	30	43	26	SW SE NW	@ road (Grange)	Elk	10/25/91	0.3420	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	6/9/88	0.2310	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	6/28/88	0.2560	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	7/12/88	0.2280	Approx.70 sprinklers upstream
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	7/27/88	0.1020	Heavy Veg.@ REW
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	8/17/88	0.0410	Approx.40 sprinklers upstream
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	8/30/88	0.0000	Approx.44 sprinklers upstream
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	9/8/88	0.0000	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	5/7/89	0.0750	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	6/12/89	0.7800	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	6/27/89	1.0280	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	7/11/89	0.9420	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	7/27/89	0.2300	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	8/8/89	0.7200	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	8/29/89	0.6000	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	9/11/89	0.6900	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	9/27/89	0.5000	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	10/24/89	0.4600	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	5/25/90	1.5400	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	6/7/90	1.3600	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	6/19/90	1.7100	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	7/2/90	1.6700	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	7/24/90	1.6200	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	8/8/90	1.4100	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	8/22/90	1.3000	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	9/12/90	1.3400	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	5/10/91	1.0900	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	6/2/91	1.2700	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	6/25/91	1.3040	

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	7/11/91	0.8160	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	7/24/91	1.1580	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	8/5/91	0.8400	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	9/11/91	1.0100	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	10/5/91	0.7680	
00010	55	PO	Otter Creek	Little Spokane River	30	43	35	NE SW SE	@ road (Kopp)	Elk	10/25/91	0.3800	
00284	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	28	44	33	NW NE	@ road	M Kit Carson	6/14/89	0.8400	
00284	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	28	44	33	NW NE	@ road	M Kit Carson	6/29/89	0.5700	
00284	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	28	44	33	NW NE	@ road	M Kit Carson	7/13/89	0.4700	
00284	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	28	44	33	NW NE	@ road	M Kit Carson	7/27/89	0.1400	
00284	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	28	44	33	NW NE	@ road	M Kit Carson	8/3/89	0.1070	
00284	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	28	44	33	NW NE	@ road	M Kit Carson	8/10/89	0.4400	
00284	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	28	44	33	NW NE	@ road	M Kit Carson	8/31/89	0.1640	
00284	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	28	44	33	NW NE	@ road	M Kit Carson	9/13/89	0.1540	
00284	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	28	44	33	NW NE	@ road	M Kit Carson	9/28/89	0.1050	
00284	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	28	44	33	NW NE	@ road	M Kit Carson	5/25/90	4.8400	
00284	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	28	44	33	NW NE	@ road	M Kit Carson	6/8/90	11.8000	
00284	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	28	44	33	NW NE	@ road	M Kit Carson	7/3/90	1.1400	
00284	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	28	44	33	NW NE	@ road	M Kit Carson	8/7/90	0.2030	
00284	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	28	44	33	NW NE	@ road	M Kit Carson	9/11/90	0.1530	
00285	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	27	44	04	NE NW/G.lot	@ road	Mead	6/14/89	0.6300	
00285	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	27	44	04	NE NW/G.lot	@ road	Mead	6/29/89	0.2800	
00285	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	27	44	04	NE NW/G.lot	@ road	Mead	7/13/89	0.2050	
00285	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	27	44	04	NE NW/G.lot	@ road	Mead	7/27/89	0.0230	
00285	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	27	44	04	NE NW/G.lot	@ road	Mead	8/10/89	0.4500	
00285	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	27	44	04	NE NW/G.lot	@ road	Mead	8/31/89	0.1130	
00285	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	27	44	04	NE NW/G.lot	@ road	Mead	9/13/89	0.0730	
00285	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	27	44	04	NE NW/G.lot	@ road	Mead	9/28/89	0.0600	
00285	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	27	44	04	NE NW/G.lot	@ road	Mead	5/25/90	5.9900	
00285	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	27	44	04	NE NW/G.lot	@ road	Mead	6/8/90	14.8000	
00285	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	27	44	04	NE NW/G.lot	@ road	Mead	7/3/90	1.5800	
00285	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	27	44	04	NE NW/G.lot	@ road	Mead	8/7/90	0.0810	
00285	55	SP	Little Deep Creek (N.Fork)	Little Deep Creek	27	44	04	NE NW/G.lot	@ road	Mead	9/11/90	0.0840	
00286	55	SP	Little Deep Creek (S.Fork)	Little Deep Creek	27	44	03	NW NW/G.lot	@ road	Foothills	6/14/89	2.1900	
00286	55	SP	Little Deep Creek (S.Fork)	Little Deep Creek	27	44	03	NW NW/G.lot	@ road	Foothills	6/29/89	1.5000	
00286	55	SP	Little Deep Creek (S.Fork)	Little Deep Creek	27	44	03	NW NW/G.lot	@ road	Foothills	7/13/89	1.3100	
00286	55	SP	Little Deep Creek (S.Fork)	Little Deep Creek	27	44	03	NW NW/G.lot	@ road	Foothills	7/27/89	0.6300	

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00286	55	SP	Little Deep Creek (S.Fork)	Little Deep Creek	27	44	03	NW NW/G.lot	@ road	Foothills	8/10/89	0.7000	
00286	55	SP	Little Deep Creek (S.Fork)	Little Deep Creek	27	44	03	NW NW/G.lot	@ road	Foothills	8/31/89	0.5300	
00286	55	SP	Little Deep Creek (S.Fork)	Little Deep Creek	27	44	03	NW NW/G.lot	@ road	Foothills	9/13/89	0.2700	
00286	55	SP	Little Deep Creek (S.Fork)	Little Deep Creek	27	44	03	NW NW/G.lot	@ road	Foothills	9/28/89	0.2250	
00286	55	SP	Little Deep Creek (S.Fork)	Little Deep Creek	27	44	03	NW NW/G.lot	@ road	Foothills	5/25/90	7.0900	
00286	55	SP	Little Deep Creek (S.Fork)	Little Deep Creek	27	44	03	NW NW/G.lot	@ road	Foothills	6/8/90	21.0000	
00286	55	SP	Little Deep Creek (S.Fork)	Little Deep Creek	27	44	03	NW NW/G.lot	@ road	Foothills	7/3/90	3.1800	
00286	55	SP	Little Deep Creek (S.Fork)	Little Deep Creek	27	44	03	NW NW/G.lot	@ road	Foothills	8/7/90	0.6000	
00286	55	SP	Little Deep Creek (S.Fork)	Little Deep Creek	27	44	03	NW NW/G.lot	@ road	Foothills	9/11/90	0.2700	
00287	55	SP	Little Deep Creek	Deadman Creek	27	44	07	SE NE	@ road (west side)	Mead	6/14/89	3.2800	
00287	55	SP	Little Deep Creek	Deadman Creek	27	44	07	SE NE	@ road (west side)	Mead	6/29/89	1.7800	
00287	55	SP	Little Deep Creek	Deadman Creek	27	44	07	SE NE	@ road (west side)	Mead	7/13/89	0.9600	
00287	55	SP	Little Deep Creek	Deadman Creek	27	44	07	SE NE	@ road (west side)	Mead	7/27/89	0.5500	
00287	55	SP	Little Deep Creek	Deadman Creek	27	44	07	SE NE	@ road (west side)	Mead	8/10/89	1.2300	
00287	55	SP	Little Deep Creek	Deadman Creek	27	44	07	SE NE	@ road (west side)	Mead	8/31/89	0.5300	
00287	55	SP	Little Deep Creek	Deadman Creek	27	44	07	SE NE	@ road (west side)	Mead	9/13/89	0.3400	
00287	55	SP	Little Deep Creek	Deadman Creek	27	44	07	SE NE	@ road (west side)	Mead	9/28/89	0.4800	
00287	55	SP	Little Deep Creek	Deadman Creek	27	44	07	SE NE	@ road (west side)	Mead	5/19/90	7.9300	
00287	55	SP	Little Deep Creek	Deadman Creek	27	44	07	SE NE	@ road (west side)	Mead	6/8/90	41.3000	
00287	55	SP	Little Deep Creek	Deadman Creek	27	44	07	SE NE	@ road (west side)	Mead	7/3/90	4.3600	
00287	55	SP	Little Deep Creek	Deadman Creek	27	44	07	SE NE	@ road (west side)	Mead	8/7/90	0.6600	
00287	55	SP	Little Deep Creek	Deadman Creek	27	44	07	SE NE	@ road (west side)	Mead	9/11/90	0.3900	
00288	55	SP	Little Deep Creek	Deadman Creek	27	43	23	SW NW	downstream from RR overpass	Mead	6/14/89	2.9800	
00288	55	SP	Little Deep Creek	Deadman Creek	27	43	23	SW NW	downstream from RR overpass	Mead	6/29/89	1.4600	
00288	55	SP	Little Deep Creek	Deadman Creek	27	43	23	SW NW	downstream from RR overpass	Mead	7/13/89	0.7590	
00288	55	SP	Little Deep Creek	Deadman Creek	27	43	23	SW NW	downstream from RR overpass	Mead	7/27/89	0.0900	
00288	55	SP	Little Deep Creek	Deadman Creek	27	43	23	SW NW	downstream from RR overpass	Mead	8/10/89	1.9600	
00288	55	SP	Little Deep Creek	Deadman Creek	27	43	23	SW NW	downstream from RR overpass	Mead	8/31/89	0.2320	
00288	55	SP	Little Deep Creek	Deadman Creek	27	43	23	SW NW	downstream from RR overpass	Mead	9/13/89	0.0630	

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	Location TO	RA	SE	QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00288	55	SP	Little Deep Creek	Deadman Creek	27	43	23	SW NW	downstream from RR overpass	Mead	9/28/89	0.0000	
00288	55	SP	Little Deep Creek	Deadman Creek	27	43	23	SW NW	downstream from RR overpass	Mead	5/19/90	8.2300	
00288	55	SP	Little Deep Creek	Deadman Creek	27	43	23	SW NW	downstream from RR overpass	Mead	6/8/90	42.5000	
00288	55	SP	Little Deep Creek	Deadman Creek	27	43	23	SW NW	downstream from RR overpass	Mead	7/3/90	5.4100	
00288	55	SP	Little Deep Creek	Deadman Creek	27	43	23	SW NW	downstream from RR overpass	Mead	8/7/90	0.1340	
00288	55	SP	Little Deep Creek	Deadman Creek	27	43	23	SW NW	downstream from RR overpass	Mead	9/11/90	0.1100	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	6/14/89	3.0300	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	6/29/89	1.6000	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	7/13/89	0.5400	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	7/27/89	0.5400	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	8/10/89	0.6100	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	8/31/89	0.7300	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	9/13/89	0.8100	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	9/28/89	0.5550	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	5/19/90	7.6400	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	6/12/90	25.8000	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	7/3/90	5.0800	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	8/7/90	0.5700	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	9/11/90	0.7500	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	5/11/91	8.8100	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	6/10/91	6.9900	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	7/10/91	2.9200	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	7/24/91	1.4500	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	8/5/91	0.8620	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	9/10/91	3.0700	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	10/5/91	0.4940	
00289	55	SP	Little Deep Creek	Deadman Creek	27	43	33	NE NE	access road (Spitz)	Mead	10/19/91	0.5000	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	6/14/89	0.1710	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	6/29/89	0.0780	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	7/13/89	0.0900	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	7/27/89	0.0400	

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	8/10/89	0.0700	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	8/31/89	0.0800	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	9/13/89	0.0600	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	9/28/89	0.0400	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	5/25/90	0.3500	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	6/8/90	0.5600	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	7/3/90	0.2300	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	8/7/90	0.0500	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	9/11/90	0.0900	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	5/11/91	0.6800	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	5/30/91	0.1200	Raining night before meas.
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	6/10/91	0.2020	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	6/19/91	0.0970	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	6/25/91	0.1620	Rain in last 24 hrs.
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	7/2/91	0.1770	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	7/9/91	0.1240	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	7/17/91	0.1510	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	7/24/91	0.0650	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	8/5/91	0.0770	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	8/22/91	0.0510	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	9/5/91	0.0370	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	9/9/91	0.0440	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	9/18/91	0.0320	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	9/25/91	0.0300	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	10/2/91	0.0330	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	10/9/91	0.0310	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	10/19/91	0.0370	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	10/23/91	0.0420	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	10/31/91	0.0630	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	11/22/91	0.1500	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	11/27/91	0.1780	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	12/4/91	0.1490	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	12/11/91	0.1700	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	1/7/92	0.2420	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	1/15/92	0.2090	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	1/22/92	0.2050	

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	1/30/92	0.5310	Water murky
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	2/5/92	0.4400	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	2/13/92	0.3830	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	2/25/92	0.4990	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	3/18/92	0.3330	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	3/25/92	0.3260	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	4/8/92	0.2650	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	4/15/92	0.3200	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	4/23/92	0.2910	
00290	55	SP	Unnamed Creek	Deadman Creek	27	44	30	SE SE	@ road	Mead	5/6/92	0.1160	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	2/13/91	0.1000	Rain
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	5/24/91	0.1600	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	5/30/91	0.2800	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	6/10/91	0.1200	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	6/19/91	0.0450	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	6/25/91	0.0630	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	7/2/91	0.0530	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	7/9/91	0.0490	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	7/17/91	0.0850	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	7/24/91	0.0690	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	8/5/91	0.0550	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	8/22/91	0.0930	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	9/5/91	0.0530	

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	9/9/91	0.0520	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	9/18/91	0.0080	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	9/25/91	0.0100	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	10/2/91	0.0160	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	10/9/91	0.0220	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	10/19/91	0.0400	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	10/23/91	0.0450	Rain
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	10/31/91	0.0360	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	11/22/91	0.0200	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	11/27/91	0.0400	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	12/4/91	0.0300	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	12/11/91	0.0660	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	1/7/92	0.0810	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	1/15/92	0.0690	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	1/22/92	0.0690	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	1/30/92	0.1820	Water murky color
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	2/5/92	0.1370	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	2/25/92	0.1140	

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	3/18/92	0.1090	Water murky color
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	3/25/92	0.1040	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	4/8/92	0.0880	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	4/15/92	0.0860	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	4/23/92	0.1100	
00290A	55	SP	Unnamed Creek	Deadman Creek	27	44	20	NE SW	@ highway (north side)	Mead	5/6/92	0.0640	Water muddy
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	6/14/89	16.5000	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	6/29/89	9.0900	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	7/13/89	8.8100	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	7/27/89	3.9000	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	8/10/89	4.2200	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	8/31/89	3.5200	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	9/13/89	2.4000	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	9/28/89	2.0200	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	6/8/90	113.0000	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	7/3/90	17.8000	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	8/7/90	5.3500	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	9/11/90	3.0400	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	5/10/91	39.3000	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	6/10/91	22.1000	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	6/24/91	14.0900	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	7/10/91	14.4000	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	7/24/91	8.3300	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	8/5/91	6.2500	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	9/10/91	2.7400	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	10/5/91	0.1980	
00291	55	SP	Deadman Creek	Little Spokane River	27	44	23	NW NE	@ road (east side)	Foothills	10/19/91	1.8250	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	6/14/89	0.1600	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	6/29/89	0.0130	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	7/13/89	0.0000	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	7/27/89	0.0000	

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	Location TO	RA	SE	QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	8/10/89	0.0000	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	8/31/89	0.0000	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	9/13/89	0.0000	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	9/28/89	0.0000	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	5/25/90	9.9900	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	6/8/90	8.5700	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	7/3/90	1.0700	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	8/7/90		No meas./Too low
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	9/11/90	0.1030	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	5/10/91	1.4800	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	5/24/91	0.3800	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	6/10/91	0.4840	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	6/25/91	0.3950	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	7/10/91	0.0710	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	7/24/91		no meas./too low
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	8/5/91	0.0130	
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	9/10/91		dry
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	10/5/91		dry
00292	55	SP	Unnamed Creek	Deadman Creek	27	44	26	SE SW	@ road (east side)	Foothills	10/19/91		dry
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	6/14/89	17.4000	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	6/29/89	9.4900	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	7/13/89	6.9800	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	7/27/89	4.6000	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	8/10/89	6.7700	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	8/31/89	4.1700	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	9/13/89	2.9200	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	9/28/89	2.6300	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	6/8/90		Too swift to measure
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	7/3/90	21.4000	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	8/7/90	5.3100	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	9/11/90	2.8100	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	5/10/91	40.6600	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	6/10/91	24.5000	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	6/25/91	16.7000	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	7/10/91	16.2900	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	7/24/91	9.9900	

Database of Ecology Stream Measurements
Little Spokane River Watershed (WRIA 55)

Point Number	WRIA	County	Source	Tributary	TO	RA	SE	Location QUARTERS	Point of Measurement	USGS Map	Date	Flow (cfs)	Flow Remarks
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	8/5/91	7.0800	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	9/10/91	3.1600	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	10/5/91	3.0400	
00293	55	SP	Deadman Creek	Little Spokane River	27	44	33	SW SE	@ road (north side)	Foothills	10/19/91	2.9600	
00294	55	SP	Peone Creek	Deadman Creek	26	44	08	NE	@ road	Mead	6/14/89	0.2870	
00294	55	SP	Peone Creek	Deadman Creek	26	44	08	NE	@ road	Mead	6/29/89	0.1540	
00294	55	SP	Peone Creek	Deadman Creek	26	44	08	NE	@ road	Mead	7/13/89	0.0700	
00294	55	SP	Peone Creek	Deadman Creek	26	44	08	NE	@ road	Mead	7/27/89	0.0000	
00294	55	SP	Peone Creek	Deadman Creek	26	44	08	NE	@ road	Mead	8/10/89	0.0000	
00294	55	SP	Peone Creek	Deadman Creek	26	44	08	NE	@ road	Mead	8/31/89	0.0400	
00294	55	SP	Peone Creek	Deadman Creek	26	44	08	NE	@ road	Mead	9/13/89	0.0200	
00294	55	SP	Peone Creek	Deadman Creek	26	44	08	NE	@ road	Mead	9/28/89	0.0000	
00294	55	SP	Peone Creek	Deadman Creek	26	44	08	NE	@ road	Mead	6/8/90	4.0000	
00294	55	SP	Peone Creek	Deadman Creek	26	44	08	NE	@ road	Mead	7/3/90	0.9000	
00294	55	SP	Peone Creek	Deadman Creek	26	44	08	NE	@ road	Mead	8/7/90	0.0500	
00294	55	SP	Peone Creek	Deadman Creek	26	44	08	NE	@ road	Mead	9/11/90	0.0500	
00295	55	SP	Unnamed Creek	Peone Creek	26	44	16	NW SE	@ road (south side)	Greenacres	6/14/89	0.3000	
00295	55	SP	Unnamed Creek	Peone Creek	26	44	16	NW SE	@ road (south side)	Greenacres	6/29/89	0.0380	
00295	55	SP	Unnamed Creek	Peone Creek	26	44	16	NW SE	@ road (south side)	Greenacres	7/13/89	0.0000	
00295	55	SP	Unnamed Creek	Peone Creek	26	44	16	NW SE	@ road (south side)	Greenacres	7/27/89	0.0000	
00295	55	SP	Unnamed Creek	Peone Creek	26	44	16	NW SE	@ road (south side)	Greenacres	8/10/89	0.0000	
00295	55	SP	Unnamed Creek	Peone Creek	26	44	16	NW SE	@ road (south side)	Greenacres	8/31/89	0.0220	
00295	55	SP	Unnamed Creek	Peone Creek	26	44	16	NW SE	@ road (south side)	Greenacres	9/28/89	0.0000	
00295	55	SP	Unnamed Creek	Peone Creek	26	44	16	NW SE	@ road (south side)	Greenacres	5/4/90	0.8100	
00295	55	SP	Unnamed Creek	Peone Creek	26	44	16	NW SE	@ road (south side)	Greenacres	6/8/90	2.8600	
00295	55	SP	Unnamed Creek	Peone Creek	26	44	16	NW SE	@ road (south side)	Greenacres	7/3/90	0.3100	
00295	55	SP	Unnamed Creek	Peone Creek	26	44	16	NW SE	@ road (south side)	Greenacres	8/7/90	0.0170	
00295	55	SP	Unnamed Creek	Peone Creek	26	44	16	NW SE	@ road (south side)	Greenacres	9/11/90	0.0460	