

1995 ANNUAL REPORT



TUALATIN RIVER FLOW MANAGEMENT TECHNICAL COMMITTEE

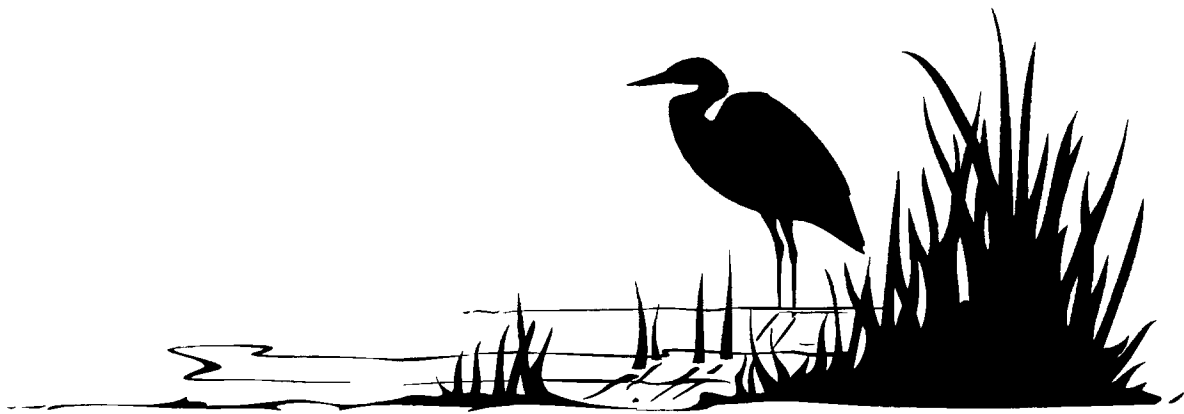
Prepared by



Unified Sewerage Agency

TUALATIN RIVER FLOW MANAGEMENT TECHNICAL COMMITTEE

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**Prepared By:
Unified Sewerage Agency
Planning Division
in Cooperation with the Oregon Water Resources Department
Watermaster District 18**

Historic Photograph of Tualatin River at Lee Falls (River Mile 71.0)
Courtesy of Washington County Historical Museum

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TUALATIN RIVER FLOW MANAGEMENT TECHNICAL COMMITTEE

COMMITTEE MEMBERS

ORGANIZATION

Jan Miller, Chair

Unified Sewerage Agency

Karl Borg

Joint Water Commission

Wally Otto

Tualatin Valley Irrigation District

Jerry Rodgers

Oregon Water Resources Department

Chuck Schaefer

Lake Oswego Corporation

Carlo Spani

Unified Sewerage Agency

Tom VanderPlaat

Unified Sewerage Agency

EXECUTIVE SUMMARY

In 1987, a committee was established of the major water users in the Tualatin River Basin. The committee was named the Tualatin River Flow Management Technical Committee. The members include Unified Sewerage Agency (USA), Tualatin Valley Irrigation District (TVID), Joint Water Commission (JWC), Lake Oswego Corporation (LOC), and the Oregon Water Resources Department (OWRD). This report is to give a review of the committees' activities during 1995. During this past year representatives of other organizations and agencies have joined in to discuss issues related to the flow management of the Tualatin River.

The committee provides a mechanism for the coordination and management of the Tualatin River. The members of the committee are technical staff that have detailed knowledge of the specific characteristics of the flow in the Tualatin River. An expanding on-going flow monitoring system has provided valuable information for management of stored water and natural flow availability in the basin. Since the issue of water quality has come to the fore-front, the monitoring system has been an excellent example of inter-agency coordination. This coordination has saved dollars for the agencies involved, and the information gathered is used by other agencies and organizations.

The committee meets monthly from February through December to review the flow and reservoir supply conditions. The attached hydrographs show the differences between 1994 and 1995 (See Appendix A). The 1995 water year was characterize as normal which may be characterized as wet given the last several years of drier than normal summers. Early summer precipitation levels were normal or slightly above normal.

Due to the wet months of May and June, streamflow for the main Tualatin and tributaries remained higher in **1995**. Average precipitation for the months of May, June and July is 4.48 inches which is 113 percent of normal; however in **1994**, precipitation for those 3 months was 2.26 inches or 57 percent of normal. The contract holders of stored water from Scoggins Reservoir started releases later than usual in the year.

BACKGROUND

The Tualatin River Basin comprises an area of 712 square miles situated in the Northwest corner of Oregon and is a subbasin of the Willamette River. The headwaters are in the Coast Range and flow in a generally easterly direction to the confluence with the Willamette River. The basin lies almost entirely in Washington County. The Tualatin River is 83 miles long and has a very flat gradient for most of its length.

The mountain reach (River Mile 85 - 58) is steep with an average gradient of 80 feet per mile. At RM 78 water released from Barney Reservoir (which is on the Middle Fork of the North Fork of the Trask River) enters the Tualatin River via an aqueduct over a low Coast Range divide. Barney Reservoir (capacity 4,040 acre-feet) stores water for the Cities of Hillsboro and Forest Grove. Water is released during the summer low-flow season to supplement shortages in natural flow. At RM 73.2 water is diverted by the City of Hillsboro at the Cherry Grove Intake, for municipal and industrial purposes.

River Mile (RM) 60 is the confluence of the Tualatin and Scoggins Creek. In the early 1970's the Bureau of Reclamation built an earthen dam on Scoggins Creek. The reservoir has a active storage capacity of 53,640 acre-feet. Scoggins Reservoir (Henry Hagg Lake) is a multipurpose facility with contracted water for irrigation, municipal and industrial, and water quality uses. Recreation is a major activity during the summer months on the reservoir. During the winter it serves as a flood control structure.

Near RM 5 on Scoggins Creek, the Tualatin Valley Irrigation District (TVID) operates the Patton Valley Pump Station. This pump station can divert water via a low pressure pipeline into the upper Tualatin River above the city of Gaston. The water is released at two outlets, one at RM 63.2 and the other at RM 64. This water is used to serve irrigators in the Wapato Improvement District (Onion Lake) and TVID users upstream of the Scoggins confluence.

The meander reach (RM 58 - 33) has an average gradient of 2.8 feet per mile. The Springhill Pumping Plant (SHPP), the largest diversion facility on the river is located at RM 56.3. This pump plant is jointly operated by the Tualatin Valley Irrigation District (TVID) and the Joint Water Commission (JWC). Both TVID and JWC have natural flow water rights that are used in the early part of the season and release contracted stored water from Scoggins Reservoir to augment declined natural flow in the summer.

Tualatin Valley Irrigation District (TVID) is the agricultural water service agency, which serves approximately 20,000 acres of irrigated cropland. They have a pumping capacity of approximately 140 cubic feet per second (CFS) or 90 million gallons per day (MGD) at the SHPP. The TVID pumps into a pressure pipeline irrigation system that serves about 10,000 acres of irrigated cropland. The remaining 10,000 acres are served directly from the Tualatin River. The JWC serves as the municipal water purveyor for the cities of Hillsboro and parts of Beaverton and Forest Grove. Their SHPP capacity is approximately 45 CFS (30 MGD).

The Unified Sewerage Agency (USA) provides sanitary and stormwater services to the urban areas of Washington County. The USA has two major wastewater treatment plants that have permits to discharge water during the summer into the Tualatin River. During the months of May to October, the Rock Creek facility discharges at RM 38.1 and the second facility, Durham, discharges at RM 9.4. Each has an average release of 23 CFS (15 MGD). The USA also releases storage water from Scoggins Reservoir for flow augmentation during the seasonal low flow periods. The goal is to maintain 150 CFS (100 MGD) at the Tualatin River at Farmington Road Bridge Gage (RM 33.3).

The reservoir reach (RM 33 - 3.4) has an estimated gradient of 0.05 feet per mile. This reach winds through the basin with a very slow travel time. The reach has several deep pools and is very different in appearance than the upper reaches. A portion of the Tualatin flow is diverted at RM 6.7 by the Lake Oswego Corporation (LOC) through the Lake Oswego Canal. A headwork structure regulates the flow into this mile long canal that feeds into Lake Oswego. The water is used to generate power below the dam at the east end of Lake Oswego. The Lake Oswego Corporation has a natural flow water right with a priority date of 1906 for 57.5 cfs and 500 acre-feet of contracted stored water for consumptive uses from Hagg Lake. At RM 3.4, a combination diversion dam/fish ladder structure is used during low flow periods to elevate the Tualatin River enough to divert the flow at the canal. During most of year, the river elevation is adequate to allow diversion of the LOC water right; however, in the summer flash boards are installed to increase the water level. This dam raises the Tualatin 2-3 feet and affects the water surface elevation for about 25 river miles. The slow movement of the water causes this reach to act much like a lake.

The riffle reach (RM 3.4 - 0) has an average gradient of 10 feet per mile. The Tualatin flows through a short reservoir section and drops into a narrow gorge in the City of West Linn to the Willamette River. The mouth of the Tualatin is just upstream from the Willamette River Falls at Oregon City.

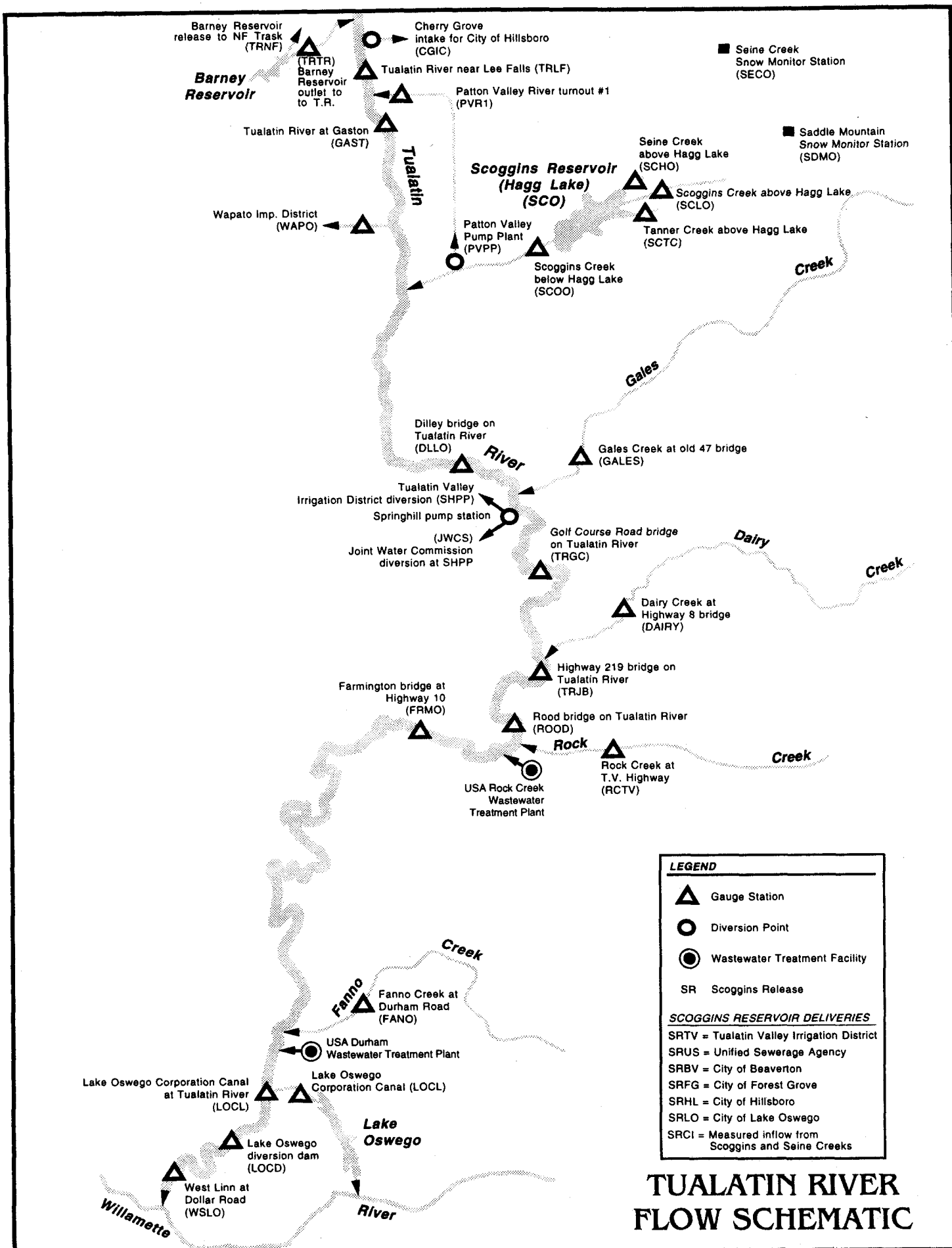
Rainfall in the Tualatin Basin ranges from 110 inches on the eastern slopes of the Coast Range to 37 inches in the southeastern area of the drainage basin. The amount of stream flow from snow is minimal. The peak months for rainfall are November through February while the driest months are normally June through October. The peak streamflow month is usually February, and the lowest streamflow month is August.

INFORMATION AND DATA COLLECTION SYSTEM

The Tualatin River Flow Management Technical Committee meet monthly from February through November. The meetings focus mainly on the review of the hydrographs and current status of the reservoirs. A variety of other water issues and problems are discussed. Each member updates the committee on any changes that could impact the flow management of the Tualatin. Minutes are recorded and reviewed at the next meeting.

A coordinated information system was developed to provide flow information to all members of the committee. Because use or release of water by any one of the entities can impact the other users, coordination of flow information is an important aspect of the committee's work. The data is collected by field staffs of the cooperating entities or from the Corps of Engineers via telemetry. A system of gaging stations, precipitation and other flow monitoring equipment has been developed during the past several years to monitor the flows on the Tualatin and the major tributaries. Significant releases and diversions are also monitored. The data collected is relayed to the local Watermaster office on a weekly basis. The data is downloaded from the Watermaster's office to USA's mainframe computer. Hydrographs (Appendix A) which show the previous year and current years data, were developed to identify and address problems related to the flow. Rainfall is shown as total weekly accumulation and three stations are currently being graphed.

A second set of hydrographs (Appendix B) was developed to show the available natural flow at various points on the mainstem of the Tualatin. These graphs depict the volume of natural flow by taking the measured flow and subtracting the storage flow. The storage flow is calculated on the releases from Scoggins and Trask Reservoirs. An evaporation loss factor reduces the storage flow and is based on an estimated loss of 0.25 percent of the flow per river mile. The main purpose for calculation of the natural flow is to determine when natural flow is no longer adequate in various river reaches. The key point in the analysis of the graphs is to detect when the available natural flow is below zero. When the natural flow graphs show flows less than zero, the reach does not have adequate water to serve all users and regulation is needed. Regulation is handled by the local Watermaster office and is done on a priority basis as required by Oregon Water Law.



Source: Unified Sewerage Agency

Source: Unified Sewerage Agency

1995 ENTITIES REPORTS

UNIFIED SEWERAGE AGENCY by Carlo Spani

Unified Sewerage Agency's (USA) flow management program for 1995 was very successful. Coordination with the Tualatin Valley Irrigation District (TVID) was excellent again this year. This led to the highest possible river flows throughout the release season on both an average and instantaneous basis.

In early May, USA requested permission from the Bureau of Reclamation (BOR) to vary from the stipulated release schedule and instead, release water based on maintaining a target river flow at the Farmington gage. The USA also requested that the BOR again, consider allowing USA the option to purchase 3,000 to 6,000 acre-feet of additional storage water. In mid July, the BOR approved the variance from the prescribed release schedule and said it would evaluate the possibility of a sale of additional water to USA later in the release season.

The USA's water release for water quality was initiated on June 24, 1995 with a target river flow goal of 120 CFS on a monthly average basis for the months June through August. September through November targets were set at 150 CFS. The river flow target was altered based on two factors. In the past five years, maintaining the river flow target of 150 CFS was not feasible in the late summer and fall due to dry climatic conditions. Secondly, studies of the river quality indicated that it was more important to have higher river flows during the September, October period rather than in July and August.

As a result of the lower river flow target as well as unusually high natural flow conditions, USA used only 3 percent of it's water allocation through August 1, 1995. Despite this significant delay in water use, the average release available for the remainder of the season was only increased by 5 CFS from 45 CFS to 50 CFS.

Uninterrupted USA releases began in early August, in part to off-set an unusual discharge of ammonia from the Rock Creek wastewater treatment facility at river mile 38. With an average USA release of 76 CFS, and an average total release of 207 CFS from August 8th through the August 21, the effect of the ammonia discharge was minimized.

Significant rainfall occurred in mid October which allowed the temporary cessation of the USA release. However, consistent rainfall that allowed the end of the release season did not occur until November 8, 1995. The USA released 78 percent of its storage allocation with the remainder conserved for a potential November dry spell.

Table A.
Water Released from Scoggins Reservoir
for Water Quality (Acre-ft.)

	<u>Max. Available</u>	<u>1995 Available</u>	<u>Consumption</u>
Storage	12,618	12,618	9,828
Natural Flow Credit	4,282	0	0
Purchased Water	3,000	0	0
-			----- 9,828*

* Release Season - June 24, 1994 to November 8, 1995 (138 Days)

Table B.
1995 River Flow Data Summary
(Cubic Feet per Second)

<u>Month</u>	Farmington Daily <u>Min/Max</u>	Farmington 7DMA <u>Min/Max</u>	Farmington Monthly <u>Average</u>	USA Release Monthly <u>Average</u>
June	202/452	225/364	280	3
July	144/398	163/263	197	2
August	118/258	137/233	184	56
Sept.	132/245	146/196	174	53
Oct.	141/606	170/322	243	32
Nov. **	201/485	209/260	255	60
Minimum	118	137	174	
Maximum	606	364	280	
Average	217			36

*7DMA = 7 Day Moving Average

** Data limited to release period (November 1 - November 8th)

The time of travel from Scoggin Reservoir to the Dilley, Golf Course, Farmington, and West Linn gages are 9 hours, 18 hours, 36 hours, and 55 hours respectively, under the high flow conditions.

TUALATIN VALLEY IRRIGATION DISTRICT by Wally Otto

The Tualatin Valley Irrigation District (TVID) began releasing stored water for irrigation from Scoggin Dam on May 31, 1995 to augment the natural flow in the Tualatin River. Water continued to be delivered at various rates until October 31, 1995, with the exception of twelve days in June and three days in October. During the 1995 irrigation season, 15,398 acre-feet of stored water was delivered to TVID to supply water needs on the Patton Valley low pressure line including the crossover line to augment flows in the Tualatin River above Gaston down to the confluence with Scoggin Creek, the Springhill Pump Plant for pipeline users, and the downstream river users of stored water to river mile 19.24. This does not include downstream TVID river users who received water from the Unified Sewerage Agency (USA) treatment plants.

The TVID requires that all district patrons who receive Bureau of Reclamation (BOR) project water complete crop reports for the previous season prior to the new irrigation season each year. Detailed maps are also required to show where project water is going to be applied for the new season. All patrons are also required to comply with the Reclamation Reform Act of 1982. If all monies due to the district are paid and the above requirements are met, the district patron is then served with project water as available and entitled. The TVID had 100 percent compliance in 1995 with all patrons who received project water.

Watermark sensors were used in 1995 to assist growers with irrigation scheduling. Several hundred sensors were placed in various fields growing a variety of crops. Some sensors were read and used by growers and others were monitored by district personnel. The sensors determine the soil moisture content. The data was then combined with the soil type, weather conditions and specific crop at the site of the sensor to indicate how much water was needed and when the water needed to be applied. This irrigation scheduling is part of the TVID water conservation program.

Scoggins Dam is operated and maintained by TVID under contract with the United States Bureau of Reclamation. All operations and maintenance at the dam went according to schedule in 1995. In May, Scoggins Dam was examined under the *Review of Operation and Maintenance (RO&M) Program* by Bureau of Reclamation officials as required by Part 231.2.3 of Reclamation Instructions. A Safety of Dams (SOD) examination was also conducted at the same time by additional Bureau of Reclamation inspectors from both Boise, Idaho and Denver, Colorado. The SOD inspection was performed in accordance with Federal Guidelines for Dam Safety as implemented in Part 753 of the Departmental Manual. Periodic examinations have been made of Scoggins Dam and its operators since 1978 with the last RO&M being made in 1992 and the last SOD examination in 1989.

A synopsis of the examination indicates that Scoggins Dam is "maintained and operated in very good condition." No new SOD recommendations were made as a result of the 1995 examination; however, several previous recommendations remain to be completed. These are

not of the nature which would in any way put the safety of the structure in jeopardy. Several RO&M recommendations were also made to assist in routine maintenance and to meet new federal codes.

Flood control was a major function of Scoggins Dam for the water/year (W/Y) 1995. For example, over 30,000 acre-feet of inflow to the reservoir was recorded in December 1994. Flood control continued at an above normal pace through March 1995 and the water/year ended with 62.94" of precipitation being recorded at the Dam. The W/Y 1996 season started earlier than ever in the 21 year history of the dam with 12.24" of precipitation recorded in November 1995 and inflow recorded at over 16,000 acre-feet.

Stored water was delivered to all the water contractors in W/Y 95. Each contractor ordered and received the following amounts for 1995:

Table C - 1995 Scoggin Reservoir - Hagg Lake Deliveries

Storage Water Contractors	Volumes Used (Acre-ft)
TVID	15,398
USA	9,824
Lake Oswego	505
Hillsboro	2,414
Forest Grove	595
Beaverton	3,741
Total	32,477

Most stored water deliveries were completed by the end of October 1995. Unified Sewerage Agency continued water deliveries until November 8, 1995 when the natural flow in the Tualatin River increased significantly due to several days of above normal precipitation. For a more detailed review of reservoir operations for 1995, a complete set of monthly spreadsheets is included with this report. See Appendix C.

TABLE D - Precipitation (October - April)

Precipitation Amounts for 1995 Water Year at Scoggins Dam			
October 1994	4.94"	May	1.47
November	9.3	June	2.44
December	11.54	July	0.58
January 1995	12	August	1.01
February	5.36	September 1995	1.89
March	7.88		
April	4.83	Total	62.94"

TABLE E -- 1995 Scoggin Dam Precipitation Data (January - June)

1995 Precipitation at Scoggin Dam					
Month	Precip - Inches	Percentage of Normal	Month	Precip. - Inches	Percentage of Normal
January	12	167%	July	0.58	104%
February	5.36	98%	August	1.01	133%
March	7.88	150%	September	1.89	114%
April	4.53	131%	October	3.7	118%
May	1.47	75%	November	12.24	166%
June	2.44	169%	December	12.17	138%
			Total	65.27	136%

JOINT WATER COMMISSION by Karl Borg

The Hillsboro-Forest Grove-Beaverton-Tualatin Valley Water District Joint Water Treatment Plant started releasing stored water from Scoggins Reservoir for the 1995 season on June 3. The releases continued until September 28.

Scarella Bros. worked on the expansion of Barney Reservoir. Mike Pihl Logging is removing marketable timber from the areas that will be under water when the expansion is complete. The releases from Barney Reservoir were arranged and coordinated with the project manager, Eldon Mills and Oregon Department of Fish and Wildlife (ODFW). The Barney Reservoir expansion will increase the impoundment capacity from 4,000 to 20,000 acre-ft. The Barney Reservoir expansion project will span the next two years.

The Joint Water Commission Water Treatment Plant will also be under construction during the next 20 months. The water plant expansion started September 1995. Completion is scheduled for June 1997. The expansion will increase plant capacity from 40 to 70 million gallons per day (MGD).

Table F
1995 Scoggins Dam Releases for The Joint Water Commission
(Acre-Feet)

<u>Month</u>	<u>Beaverton</u>	<u>Hillsboro</u>	<u>Forest Grove</u>	<u>Total</u>
June	857	117	14	988
July	1,214	460	119	1,793
August	1,002	1,010	200	2,212
September	668	827	262	1,757
October	0	0	0	0
Total	3,741	2,414	595	6,750

Table G
1995 Barney Reservoir releases for the Joint Barney Commission
(Acre-Feet)

<u>Month</u>	<u>Beaverton</u>	<u>Hillsboro</u>	<u>Forest Grove</u>	<u>TVWD</u>	<u>USA</u>	<u>Total</u>
June	0	725	104	0	0	829
July	0	569	81	0	0	650
August	21	98	127	61	0	286
September	211	18	2	70	0	90
October	2	3	0	4	297	7
Total	234	1,413	314	135	297	2,393

LAKE OSWEGO CORPORATION by Chuck Schaefer

The 1995 Water Management and Water Quality Program for Oswego Lake, its canal and embayments continues to challenge us.

Lake Oswego Corporation (LOC) primary concerns are to reduce nutrient levels and associated algae growth. Our objectives continue to be for water safety, protection of water rights, land use planning and protection of the beneficial uses of the lake.

Oswego Lake has additional challenges which are unique to its status as a lake. We continue to work on six problem areas:

1. Reduction of nutrients.
2. Reduction of sediments.
3. Removal of rooted aquatic plants.
4. Fecal Coliform bacteria.
5. Debris pollution.
6. Resolve special problems peculiar to limited areas of the lake.

A drain the lake year was 1994. We processed 95 shoreline construction and repair permits, including two major City of Lake Oswego projects. This summer we hired a limnology graduate, Mark Goossen from Indiana University to assist in achieving new goals in our Water Management Plan. He is working on the following elements:

1. Understanding of the biological and chemical processes of Lake Oswego.
2. Identification of rooted water plants and algae species.
3. Setup and utilize new laboratory equipment and establish an in-house capability for analyses for fecal coliforms and other water quality constituents.

The secchi disk readings were exceptional during the late spring, and early and late summer months. Some of the reading were above 10 meters (~39 feet). The improved water quality in Lake Oswego is believed to have come from above average rainfall, cooler summer night temperatures and higher than normal natural and storage flows in the Tualatin watershed. As a result, copper sulfate applications were reduced during 1995.

"Blue-Greens Attack with Vengeance"

"In mid-August, the surface of much of the lake turned green, with only Lakewood Bay initially showing some resistance. Until that time the lake had achieved record clarity, with visibility down to over 20 feet. Since algae becomes fertilizers for more algae, we hoped that the good July would cause us to have a better than usual August. However, most of the nutrients still come to us via the Tualatin River.

Even though the river is better than it once was, when our 75 degrees, there were plenty of nutrients to supply the blue-green algae that then flourished. Blue greens can tolerate bright sun with the ultraviolet radiation at the surface better than other algae species and they love the warm water. In addition, they are capable of adjusting their depth by changing the size of the intracellular gas bubbles. Finally, if there is an abundance of phosphorus along with a relative shortage of nitrogen, the blue-greens can "fix" their own nitrogen from the atmosphere. These types of algae form colonies of a larger size than can be eaten by the tiny zooplankton animals that devour the smaller types of algae.

This year, we went out of our way to preserve these microscopic zooplankton, a maneuver that we hope lead to outstanding main water quality in the both June and July." as written by Dr. Paul Ash, Water Quality Chairman.

In conclusion, as reported by Mark Goossen, LOC graduate limnologist, phosphorus loading to Lake Oswego remains an obstacle. Algae growth will continue to be a problem as long as nutrient loading remains at the current level. Any reductions in the nutrient loading could only have a desirable impact on the lake's water quality. Levels of phosphorus in the Tualatin River should be closely monitored. Also nutrient sampling of the lake should be continued on a monthly basis. As greater improvements in the Tualatin River phosphorus level occur, the lake's response should be studied. All of these elements will help in determining how best to manage the lake.

Our long term objective in water quality is to continue to work hard to reduce phosphorus input to the levels that provide substantial reductions in the use of copper need for algae. With new lab equipment and continued monitoring of nutrient levels in our program, we hope to produce modeling and annual evaluations that assist lake and river managers to develop good alternative methods to improve guarantee water quality and maintain adequate water resources.

OREGON WATER RESOURCES DEPARTMENT by Jerry Rodgers

The Tualatin Basin Watermaster office flow management activities included operation of the stream gaging network and regulation of water withdrawals within the basin. The gaging network provides information on water availability and is the framework for regulatory decisions on water use. This information is vital to making decisions on releases from Scoggins and Barney Reservoirs. Staffing to operate the system of gages is a cooperative funding effort by the agencies with contracted water in Scoggins Reservoir. Table H lists the stations monitored in 1995.

Equipment upgrades were made to the Tualatin River at Golf Course Bridge, Gales Creek at Highway 47, and Dairy Creek at Highway 8 gaging stations. Punch tape gages were replaced with data loggers that simplify data manipulation and will provide the opportunity to collect more parameters. Communication improvements were made to the Tualatin River at Golf Course Bridge and Tualatin River at Oswego Canal stations. Modem communication was added to the Gales Creek at Highway 47 station.

Development of the Tualatin River Drainage Water Right Information Program (WRIP) continued with the addition of the West Fork Dairy Creek Subbasin. All surface water rights in this subbasin are now entered in a relational database. Information includes water rights by individual tax lot, by priority date, and diversion point by river mile. The database allows the generation of water right holders for any reach of the stream by priority date. Water users can be targeted for informational releases or regulatory action related to their area. Work continues on adding tributaries to this database during the off season. The Fanno, Dairy, and McKay Creek Basins are planned to be added by the summer of 1996.

By knowing both flow and demand, decisions on who is entitled to natural flow are easier to make, thereby protecting senior water right holders. Table I summarizes 1995 regulatory activity.

Although regulation started earlier in 1995 than in 1994, timely precipitation limited overall regulation to a reduced level than recent years. Reservoir carryover into 1996 is close to the 20 year average.

Table H
Tualatin Basin 1995 Streamflow Stations

Stream	Stream Mile	Type
Ash Creek @ Greenburg	0.1	Staff
Beaverton Creek @ 216th	1.2	Staff
Beaverton Creek @ 170th	5.0	Staff
Bronson Creek @ 185th	1.4	USGS-Gage
WF Dairy Creek @ Evers Rd	1.9	Staff
*Fanno Creek @ Durham	1.2	USGS-Recorder
Fanno Creek @ Bonita	2.1	Staff
Fanno Creek @ Tuckerwood	7.3	Staff
Fanno Creek @ Scholls nr Allen	9.4	Staff
Fanno Creek @ 56th	12.6	Recorder-USGS
*Gales Creek @ Hwy 47	2.4	Recorder
Gales Creek @ Clapshaw Rd	12.4	Staff
Johnson Creek @ Davis	1.3	Staff
McKay Creek @ Hornecker Rd	2.2	Staff-summer
McKay Creek @ Glencoe	4.3	Staff-winter
McKay Creek @ Northup Rd	15.3	Staff
EF McKay Creek @ Dixie Mtn Rd	0.6	Staff
Oswego Canal (from Tualatin R)	6.7	Recorder
Rock Creek @ Hwy 8	1.2	Recorder
Rock Creek @ Quatama Rd	4.9	Staff
Sain Creek ab Scoggins Res	1.6	Recorder
*Scoggins Creek ab Scoggins Res	8.0	Recorder
*Scoggins Creek be Scoggins Res	4.8	USGS-Recorder
Summer Creek @ Fowler School	0.2	Staff
Tanner Creek ab Scoggins Res	1.6	Staff
Tualatin River be Lee Falls	70.5	Staff
*Tualatin River @ Gaston	63.9	Recorder
*Tualatin River @ Dilley	58.8	USGS-Recorder
*Tualatin River @ Golf Course Rd	51.5	Recorder
Tualatin River @ Hwy 219	44.4	Staff
*Tualatin River @ Rood Br	38.4	Recorder
*Tualatin River @ Farmington	33.3	Recorder
Tualatin River @ Elsner	16.2	Staff
*Tualatin River @ Oswego Canal (elevation only)	6.7	Recorder
*Tualatin River @ West Linn	1.8	USGS-Recorder
Wapato Canal (from Tualatin R)	61.9	Staff
* Telemetry		

TABLE I 1995 OWRD Tualatin Basin Surface Water Regulation Summary

DATE	STREAM REGULATED	PRIORITY DATE
6/2	Tualatin R ab mile 44.73	1/1/1974
6/28	Tualatin R ab mile 44.73	2/1/1963
6/28	Gales Creek subbasin	2/1/1963
7/20	Tualatin R ab mile 60.00	1/1/1940
7/28	Tualatin R mile 56.80 to 60.00	1/1/1945
7/31	Remainder of basin	10/8/1976
8/2	Tualatin R ab mile 60.00	1/1/1930
8/17	EF Dairy Cr subbasin ab mile 13.0	5/25/1966
9/30	WRIP Database End of Season Notices	

WATER QUALITY INFORMATION SUMMARY UNIFIED SEWERAGE AGENCY (USA)

By Jan Miller

Total Phosphorus TMDL and Point Source Wasteload & Nonpoint Source Load Allocations

In 1989, a total phosphorus Total Maximum Daily Load (TMDL) was established for point and nonpoint sources in the Tualatin Basin. The wastewater treatment plants were upgraded and a surface water management plan was adopted. The point sources met their TMDL on schedule. The nonpoint sources are not meeting their TMDL. The compliance schedule for the nonpoint sources has been extended to March 31, 1997. Tables on the following pages, describe the conditions in the Tualatin Basin relative to the TMDL. All calculations were done as specified in the TMDL or the water quality standard using data from the USA monitoring program unless otherwise specified.

The first table on the page titled, STATUS OF THE TUALATIN RIVER - TOTAL PHOSPHORUS TMDL, shows the monthly median total phosphorus for the sites that have assigned TMDL values or are required monitoring sites. Data that are above a site's TMDL are shaded. Very few of the sites meet the TMDL. Tualatin River sites are very close to their TMDLs. Most of the tributaries are significantly above their TMDL. The Rock Creek subbasin has higher levels than the others. Work is underway to find the cause of these higher values.

The second table shows the three-month average for the Chlorophyll *a* at the required monitoring sites. Even with the reductions in total phosphorus, the Tualatin River is not meeting the Chlorophyll *a* target level.

The final table shows the results of the continuous monitor that the U.S. Geological Survey (USGS) maintains at the Lake Oswego diversion dam at river mile 3.4. Dissolved Oxygen (DO) is a primary indicator of water quality in terms of aquatic life. The current water quality standard is 6.0 mg/l for the Tualatin River. Traditionally it has been measured as a grab when samples are collected. This does not give a complete picture of the conditions that the aquatic organisms are exposed to during the day. Since DO can change dramatically over the course of a day during an algal bloom, it is better to measure it continually. To portray this data the percentage of hours is given. The standard was not met. Values drop below 6.0 mg/l for various reasons. It can be due to decomposition of algae when they die off, or due to sediment oxygen demand when temperature changes cause the slow-moving sections of the river to "turn over", or to high ammonia levels. The Environmental Quality Commission (EQC) is expected to change the DO standard in the Tualatin Basin from 6.0 mg/l to 6.5 mg/l in early 1996. Although not a water quality standard, high DO can be a problem by causing the water to become supersaturated. This happens when there are algae blooms that produce large quantities of oxygen during the day-light hours. The pH also is a primary indicator of water quality in terms of aquatic health. The water quality standard for the Tualatin River is 6.5 to 8.5. During algae blooms, the pH goes up during the day and drops during the night.

The increases can cause the standard to be exceeded. Decreases in algae production during the night allow the pH to return to neutral and therefore, do not cause violations.

The second page titled, STATUS OF THE TUALATIN RIVER - POINT SOURCE WASTE LOAD ALLOCATIONS & NON POINT SOURCE LOAD ALLOCATIONS, shows the various inputs to the Tualatin River in terms of waste load allocation (WLA) for point sources or load allocation (LA) for nonpoint sources.

The first table shows the two USA summer-discharging wastewater treatment plants. The allowed total phosphorus load is tied to the river flow at the Farmington gauge and the Treatment Plant flow. The USA has stored water in Hagg Lake that it releases to increase the flow in the Tualatin River. The USA's goal is to release this water to maintain between 120 and 150 CFS at the Farmington gauge. Generally 120 CFS is enough in the early summer. If there is sufficient water to maintain 150 CFS until November 30, extra water will be released to keep the flow above 200 CFS in October and November. The treatment plants released less total phosphorus (MEDIAN LB) than was allowed by their WLA. Therefore, they meet the point source TMDL.

The second table shows one reason that the Tualatin River did not meet the TMDL. Except Scoggins Creek (Hagg Lake is the source water), the tributaries did not meet their LAs. The values, where the LAs are not met, are shaded. Therefore, the nonpoint sources do not meet the TMDL.

STATUS OF THE TUALATIN RIVER TOTAL PHOSPHORUS TMDL

1995	TOTAL PHOSPHORUS mg/l		MONTHLY MEDIAN		(Compliance or Required Monitoring Sites)				
TUALATIN RIVER	RIVER MILE	TMDL 1996	SAMPLES/ MONTH	MAY	JUN	JUL	AUG	SEP	OCT
CHERRY GROVE	71.5	0.02	5	0.01	0.01	0.01	0.01	0.01	0.01
DILLEY	61.2	0.04	5	0.03	0.03	0.01	0.03	0.03	0.04
GOLF COURSE	52.8	0.045	5	0.05	0.05	0.04	0.04	0.03	0.04
ROOD ROAD	39.1	0.05	5	0.08	0.08	0.07	0.06	0.07	0.08
FARMINGTON	33.6	0.07	1	0.09	0.08	0.08	0.06	0.07	0.11
SCHOLLS	27.1	0.07	9	0.09	0.10	0.10	0.07	0.08	0.10
ELSNER	16.5	0.07	9	0.09	0.10	0.10	0.08	0.07	0.10
BOONES FERRY	8.7	0.07	9	0.09	0.10	0.10	0.08	0.08	0.11
STAFFORD	5.4	0.07	9	0.09	0.10	0.10	0.08	0.07	0.10
<u>TRIBUTARIES</u>									
SCOGGINS	60	0.06	5	0.04	0.03	0.02	0.01	0.03	0.01
GALES	56.8	0.045	5	0.04	0.04	0.05	0.05	0.05	0.05
DAIRY	44.7	0.045	5	0.09	0.09	0.12	0.13	0.14	0.12
MCKAY	44.7	0.045	5	0.06	0.08	0.12	0.12	0.15	0.10
ROCK	38.1	0.07	5	0.18	0.25	0.23	0.21	0.21	0.18
CHICKEN	15.5	0.07	5	0.09	0.11	0.13	0.12	0.13	0.12
FANNO	9.3	0.07	5	0.12	0.16	0.15	0.14	0.16	0.14

1995	CHLOROPHYLL a ug/l	Three Month Stratified MEAN		(Required Monitoring Sites)				
TUALATIN RIVER	RIVER MILE	WQ CRITERIA	MAR-MAY	APR-JUN	MAY-JUL	JUN-AUG	JUL-SEP	AUG-OCT
ROOD ROAD	39.1	15	4.0	3.9	4.4	4.1	4.2	3.7
FARMINGTON	33.6	15	3.5	3.6	3.7	4.6	4.4	4.3
SCHOLLS	27.1	15	4.2	4.9	6.9	7.7	6.9	5.0
ELSNER	16.5	15	5.6	9.9	19.5	28.5	28.2	19.2
BOONES FERRY	8.7	15	6.9	13.8	21.3	27.4	24.3	17.6
STAFFORD	5.4	15	7.4	16.9	27.6	37.6	33.0	23.8
<u>TRIBUTARIES</u>								
DAIRY CREEK	44.7	15	3.1	3.2	3.7	4.5	5.0	4.2
ROCK CREEK	38.1	15	7.1	5.9	6.1	5.9	4.4	4.6
CHICKEN CREEK	15.5	15	1.4	1.8	2.0	2.7	2.3	2.1
FANNO CREEK	9.3	15	6.8	7.7	5.3	4.7	3.9	4.5

Tributaries are sampled near the mouth. River mile indicates where they intersect the Tualatin River.
"Less than" values are used in the calculations at half their value (0.5 times the detection limit).

1995	USGS CONTINUOUS MONITOR	HOURLY READINGS		(River Mile 3.4)			
DISSOLVED OXYGEN(DO) MG/L		MAY	JUN	JUL	AUG	SEP	OCT
*Percentage of time greater than 13.5		0	2.7	7.5	7.1	0	0
Percentage of time less than 6.5		0	0	1.7	6.2	7.2	46.3
Percentage of time less than 6.0		0	0	0.1	0	1.1	5.8
pH							
Percentage of time greater than 8.5		0	2.0	0.5	6.3	0	0
Percentage of time less than 6.5		0	0	0	0	0	0

*At a DO of 13.5 and temperature of 20 deg c., the percent DO saturation is 150% which can cause problems, but it is not a Water Quality Standard.

Shading indicates that a limit is not being met.

**STATUS OF THE TUALATIN RIVER
POINT SOURCE WASTELOAD ALLOCATION & NONPOINT SOURCE LOAD ALLOCATION
TOTAL PHOSPHORUS**

1995 TREATMENT PLANT WASTELOAD ALLOCATIONS (WLA)

SITE	INFO	STAT.	UNITS	MAY	JUN	JUL	AUG	SEP	OCT
FARMINGTON	FLOW	MEAN	CFS	596	280	197	184	174	242
FARMINGTON GOAL	FLOW	MEAN	CFS	120	120	120	150	150	**200
*USA RELEASE	FLOW	MEAN	CFS	0	3.4	1.6	55.0	52.9	32
	FLOW	TOTAL	AC-FT	0	204	99	3416	3150	1005
	FLOW	YTD	AC-FT	0	204	303	3719	5879	8872
DURHAM EFFLUENT	FLOW	MEAN	MGD	20.5	18.6	16.9	17.3	16.8	19.1
	T-PO4-P	MEDIAN	MG/L	0.03	0.03	0.03	0.03	0.03	0.03
	T-PO4-P	WLA	LB	16.0	13.0	12.0	12.0	12.0	14
	T-PO4-P	MEDIAN	LB	5.3	4.6	4.2	4.4	4.4	4.6
ROCK CREEK	FLOW	MEAN	MGD	20.9	19.1	18.3	17.9	17.5	18.9
	T-PO4-P	MEDIAN	MG/L	0.03	0.02	0.03	0.03	0.02	0.05
	T-PO4-P	WLA	LB	38.0	28.0	22.0	22.0	22.0	27
	T-PO4-P	MEDIAN	LB	4.9	3.5	4.4	4.4	2.9	7.5

Based on daily values

*USA RELEASE from Hagg Lake for flow augmentation (total available from storage 12,618 AC-FT).

** Actual goal 150 cfs but there was enough water in storage to maintain 200 cfs.

1995 TRIBUTARY LOADS RELATIVE TO 1996 LOAD ALLOCATIONS (LA)

SITE	INFO	STAT.	UNITS	MAY	JUN	JUL	AUG	SEP	OCT
SCOGGINS CK	FLOW	MEAN	CFS	51.1	75.0	133	161	134	67.2
	T-PO4-P	LA	LB	10.8	10.8	21.6	32.3	21.6	10.8
	T-PO4-P	MEDIAN	LB	7.5	7.9	14.3	14.1	21.5	4.8
GALES CREEK	FLOW	MEAN	CFS	101.0	52.9	22.4	17.5	21.4	31.4
	T-PO4-P	LA	LB	12.1	12.1	2.4	2.4	2.4	6.1
	T-PO4-P	MEDIAN	LB	20.2	11.5	7.0	4.7	5.5	7
DAIRY CREEK	FLOW	MEAN	CFS	255.4	97.5	49.5	25.0	20.6	62
	T-PO4-P	LA	LB	24.3	12.1	6.1	6.1	2.4	12.1
	T-PO4-P	MEDIAN	LB	122.7	52.6	26.2	17.4	14.4	36.2
ROCK CREEK	FLOW	MEAN	CFS	30.8	54.3	20.4	9.8	16.4	27.9
	T-PO4-P	LA	LB	9.4	9.4	3.8	1.9	3.8	9.4
	T-PO4-P	MEDIAN	LB	24.5	55.4	15.6	11.5	14.2	25.3
FANNO CREEK	FLOW	MEAN	CFS	29.3	20.6	10.3	11.0	10.3	20.6
	T-PO4-P	LA	LB	9.4	3.8	3.8	3.8	3.8	3.8
	T-PO4-P	MEDIAN	LB	13.3	17.6	6.5	5.4	6.8	7.1

Based on weekly samples

"Less than" values are used in the calculations at half their value (0.5 times the detection limit).

Shading indicated that WLA (NPDES Permit) or LA (TMDL 22M-02-004 Schl A.2) are not being met.

Ammonia TMDL and Point Source Wasteload & Nonpoint Source Load Allocations

In 1989 an ammonia Total Maximum Daily Load (TMDL) was established for point sources in the Tualatin Basin. The wastewater treatment plants were upgraded. The Tualatin Basin currently meets the ammonia TMDL. Tables on the following pages describe the conditions in the Tualatin Basin relative to the TMDL. All calculations were done as specified in the TMDL or the specific water quality standard using data from the USA monitoring program unless otherwise specified.

The first table on the page titled, STATUS OF THE TUALATIN RIVER - AMMONIA TMDL, shows the monthly median ammonia for the sites that have assigned TMDL values or are required monitoring sites. Data that are above a site's TMDL are shaded. Most of the sites meet the TMDL, most of the time. In May, USA is often granted a variance that allows the two smaller treatment plants, Forest Grove at river mile 56.7 and Hillsboro at river mile 44, to discharge to the Tualatin River until the flow at Farmington drops below 250 CFS. This is the most likely cause of the higher levels of ammonia during May. Because of the high flow and cool weather this does not cause low dissolved oxygen or toxicity problems.

The second table shows the minimum dissolved oxygen reading at the listed site for the month. Dissolved Oxygen (DO) is a primary indicator of water quality conditions in terms of aquatic life. These data represent instantaneous readings taken when the samples are collected. The current water quality standard on the Tualatin River is 6.0 mg/l. It is expected to be 6.5 mg/l after the EQC accepts the recommendations of Department of Environmental Quality (DEQ) following the 1992-1994 triennial review of the water quality standards. The tributaries currently have a percent dissolved oxygen standard of 90 percent rather than a concentration standard. After the EQC accepts the recommendations of DEQ this is expected to change to the dissolved oxygen standard of 6.5 mg/l also. For the tributaries, both the dissolved oxygen and the percent saturation values are shown. Only the values below the current percent saturation standard are highlighted.

The third table shows the results of the continuous monitor that the USGS maintains at the Lake Oswego diversion dam, river mile 3.4. Unlike the second table that shows the result of grab samples, this shows the results of a continuous recorder. To portray this data, the percentage of hours is given. The standard was not met. Values drop below 6.0 mg/l for various reasons. It can be due to decomposition of algae when they die off, due to high ammonia levels, or due to sediment oxygen demand when water temperature changes cause the slow-moving sections of the river to "turn over" mixing the water with very low dissolved oxygen levels with the rest of the water column.

The fourth table shows the time periods and locations of chronic ammonia toxicity. To determine toxicity, the ammonia level, pH, and temperature must be considered. To cause chronic toxicity, the levels must be exceeded for four continuous days.

The second page, entitled STATUS OF THE TUALATIN RIVER - POINT SOURCE WASTE LOAD ALLOCATIONS & NON POINT SOURCE LOAD ALLOCATIONS, shows the various inputs to the Tualatin River in terms of waste load allocation (WLA) or load allocation (LA).

The first table shows the two USA summer-discharging wastewater treatment plants. The allowed ammonia load is tied to the river flow at the Farmington gauge and the Treatment Plant flow. The USA has stored water in Hagg Lake which it uses to increase the flow in the Tualatin River. The USA's goal is to release this water to maintain between 120 and 150 CFS at the Farmington gauge. Generally 120 CFS is enough in the early summer. If there is sufficient water to maintain 150 CFS until November 30, extra water will be released to keep the flow above 200 CFS in October and November. The treatment plants release significantly less ammonia (MEDIAN LB) than is allowed by their WLA.

The second table shows the tributary load allocations (LA) and the pounds in the tributaries. The ammonia tributary load allocations are based on the flow at Rood Road on the Tualatin River. Except for Rood Road, the tributaries easily meet their load allocations. Rood Road meets its TMDL, but most of the time not its load allocation.

STATUS OF THE TUALATIN RIVER AMMONIA TMDL

1995 AMMONIA	MG/L	MONTHLY MEDIAN	(Compliance or Required Monitoring Sites)						
<u>TUALATIN RIVER</u>	RIVER MILE	TMDL 1996	SAMPLES/MONTH	MAY	JUN	JUL	AUG	SEP	OCT
CHERRY GROVE	71.5	0.03	5	0.01	0.01	0.01	0.01	0.01	0.01
DILLEY	61.2	0.03	5	0.03	0.01	0.01	0.01	0.01	0.01
GOLF COURSE	52.8	0.04	5	0.05	0.01	0.01	0.01	0.02	0.01
ROOD ROAD	39.1	0.05	5	0.1	0.03	0.04	0.01	0.04	0.02
FARMINGTON	33.6	1.00	1	0.21	0.04	0.04	0.03	0.04	0.03
SCHOLLS	27.1	1.00	9	0.12	0.03	0.03	0.43	0.04	0.04
ELSNER	16.5	0.85	9	0.12	0.01	0.01	0.03	0.01	0.03
BOONES FERRY	8.7	0.85	9	0.07	0.01	0.04	0.08	0.03	0.05
STAFFORD	5.4	0.85	9	0.08	0.01	0.03	0.06	0.04	0.03
<u>TRIBUTARIES</u>									
SCOGGINS	60	0.03	5	0.03	0.01	0.01	0.01	0.02	0.01
GALES	56.8	0.04	5	0.01	0.01	0.03	0.02	0.02	0.01
DAIRY	44.7	0.04	5	0.04	0.03	0.04	0.03	0.04	0.03
MCKAY	44.7	0.04	5	0.04	0.03	0.04	0.04	0.04	0.01
ROCK	38.1	0.10	5	0.04	0.03	0.04	0.03	0.03	0.01
CHICKEN	15.5	0.10	5	0.06	0.05	0.06	0.05	0.06	0.03
FANNO	9.3	0.10	5	0.04	0.05	0.04	0.05	0.05	0.06

1995 MINIMUM DISSOLVED OXYGEN (DO) Monthly minimum measured at 3 feet, if multiple depths measured. Proposed standard 6.5 mg/l.

8-1														
<u>TUALATIN RIVER</u>	RIVER MILE	WQL STANDARD	MAY		JUN		JUL		AUG		SEP		OCT	
ROOD ROAD	39.1	6.0 mg/l		7.3		8.2		7.4		9.2		8.2		6.2
FARMINGTON	33.6	6.0 mg/l		9.6		7.9		8.4		8.4		7.9		7.6
SCHOLLS	27.1	6.0 mg/l		7.4		7.0		7.3		4.7		7.2		7.3
ELSNER	16.5	6.0 mg/l		7.3		7.3		6.1		6.1		6.7		6.1
BOONES FERRY	8.7	6.0 mg/l		7.9		7.4		6.6		6.7		6.3		6.0
STAFFORD	5.4	6.0 mg/l		8.3		7.5		7.8		6.7		6.5		6.1
<u>TRIBUTARIES</u>			%S	DO	%S	DO	%S	DO	%S	DO	%S	DO	%S	DO
DAIRY CREEK	44.7	90% Sat.	76	7.5	77	7.4	76	6.8	79	7.4	70	7.0	67	7.2
ROCK CREEK	38.1	90 % Sat.	65	6.3	67	6.3	65	5.8	65	6.1	60	6.0	59	6.8
CHICKEN CREEK	15.5	90% Sat.	69	6.8	64	6.2	58	5.3	59	5.8	53	5.4	60	6.4
FANNO CREEK	9.3	90% Sat.	73	7.0	72	7.1	69	6.1	66	6.2	64	6.1	69	7.2

Tributaries are sampled near the mouth. River mile indicates where they intersect the Tualatin River.

"Less than" values are used in the calculations at half their value (0.5 times the detection limit).

1995 USGS CONTINUOUS MONITOR HOURLY READINGS (River Mile 3.4) Note: Proposed standard is 6.5 mg/l

DISSOLVED OXYGEN(DO) MG/L	MAY	JUN	JUL	AUG	SEP	OCT
Percentage of time less than 6.5	0	0	1.7	6.2	7.2	46.3
Percentage of time less than 6.0	0	0	0.1	0	1.1	5.8

CHRONIC AMMONIA TOXICITY	MAY	JUN	JUL	AUG	SEP	OCT
Site	None	None	None	Scholls	None	None
Duration (4 Days = Violation)				1 Day		

Shading indicates that a limit is not being met.

STATUS OF THE TUALATIN RIVER
POINT SOURCE WASTELOAD ALLOCATION & NONPOINT SOURCE LOAD ALLOCATION
AMMONIA

1995 TREATMENT PLANT WASTELOAD ALLOCATIONS (WLA)
Relative to Farmington Flow and Treatment Plant Flow

SITE	INFO	STAT.	UNITS	MAY	JUN	JUL	AUG	SEP	OCT
FARMINGTON	FLOW	MEAN	CFS	596	280	197	184	174	242
FARMINGTON GOAL	FLOW	MEAN	CFS	120	120	120	150	150	**200
*USA RELEASE	FLOW	MEAN	CFS	0	3.4	1.6	55.0	52.9	32
	FLOW	TOTAL	AC-FT	0	204	99	3416	3150	1005
	FLOW	YTD	AC-FT	0	204	303	3719	5879	8872
DURHAM EFFLUENT	FLOW	MEAN	MGD	20.5	18.6	16.9	17.3	16.8	19.1
	NH3-N	MEDIAN	MG/L	0.04	0.05	0.04	0.03	0.03	0.03
	NH3-N	WLA	LB	433	412	373	373	373	433
	NH3-N	MEDIAN	LB	7.2	7.1	6.2	4.2	4.3	4.5
ROCK CREEK EFFLUENT	FLOW	MEAN	MGD	20.9	19.1	18.3	17.9	17.5	18.9
	NH3-N	MEDIAN	MG/L	1.20	0.23	0.03	1.1	0.02	0.02
	NH3-N	WLA	LB	1042	1042	782	782	782	1041
	NH3-N	MEDIAN	LB	213	36	4	161	2.9	3

Based on daily values

*USA RELEASE from Hagg Lake for flow augmentation (total available from storage 12,618 AC-FT).

** Actual goal 150 cfs but there was enough water in storage to maintain 200 cfs.

1995 LOADS RELATIVE TO 1996 LOAD ALLOCATIONS (LA)
Relative to Farmington Flow

SITE	INFO	STAT.	UNITS	MAY	JUN	JUL	AUG	SEP	OCT
TUALATIN RIVER	FLOW	MEAN	CFS	513	246	170	151	120	137
AT ROOD ROAD	NH3-N	LA	LB	65	40	20	20	20	40
	NH3-N	MEDIAN	LB	323	40	25	9.5	20.6	15
ROCK CREEK	FLOW	MEAN	CFS	30.8	54.3	20.4	9.8	16.4	27.9
	NH3-N	LA	LB	16	11	8	8	8	11
	NH3-N	MEDIAN	LB	5.1	5.5	2.7	1.5	2	1.5
CHICKEN CREEK	FLOW	MEAN	CFS	10.9	4.7	3.2	1.3	1.3	2.9
	NH3-N	LA	LB	6	4	3	3	3.0	4
	NH3-N	MEDIAN	LB	3	1.2	0.9	0.3	0.4	0.4
FANNO CREEK	FLOW	MEAN	CFS	29.3	20.6	10.3	11.0	10.3	21
	NH3-N	LA	LB	9	6	5	5	5.0	6
	NH3-N	MEDIAN	LB	3.4	5.5	1.8	1.7	2.2	2.9

Based on weekly samples

"Less than" values are used in the calculations at half their value (0.5 times the detection limit).

Shading indicated that WLA (NPDES Permit) or LA (TMDL 22M-01-004 Schl A#2) are not being met.

REPORT SUMMARY

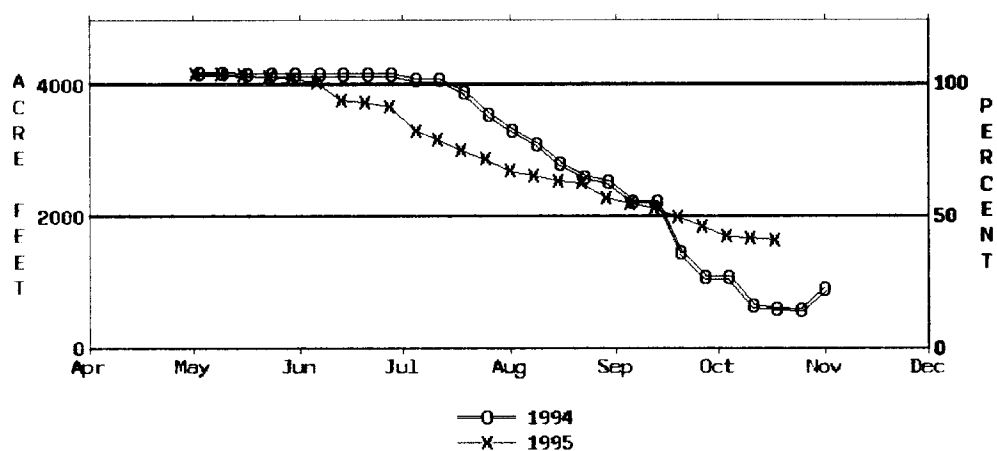
The Tualatin River Flow Management Technical Committee is and will continue to be an important part of the water resources management activities in the Tualatin Basin. The information system and monitoring network will need telemetry and equipment improvements to enhance current information and improve reservoir release efficiencies. Additional stations may need to be established where data gaps are found.

The committee has provided the vehicle for coordination and awareness of impacts caused by each entities operations. In 1995, the committee worked towards improvement of the monitoring system. The coordination continues to provided a unique opportunity for partnerships in water management and show the importance of a watershed basis approach. Data collected will provide decision makers with some of the key information needed to make those difficult choices when there are conflicts on water management issues.

Hydrographs for Flow Monitoring Sites

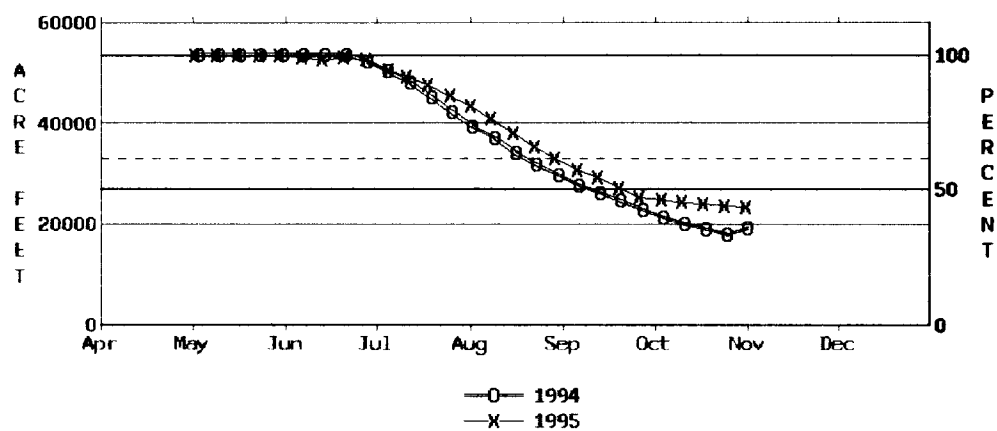
APPENDIX A

TRASK (BARNEY RESERVOIR CONTENT) (TBRC)



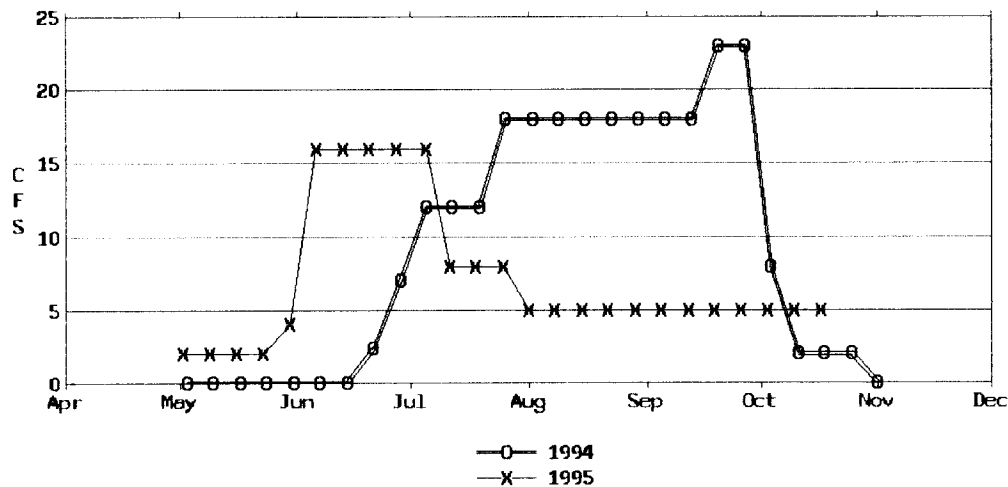
MAXIMUM POOL = 4040.8 AF AT 1590.8 FEET
 MINIMUM POOL = 0.0 AF AT 1530 FEET

SCOGGIN RESERVOIR STORAGE CONTENT (SCO)

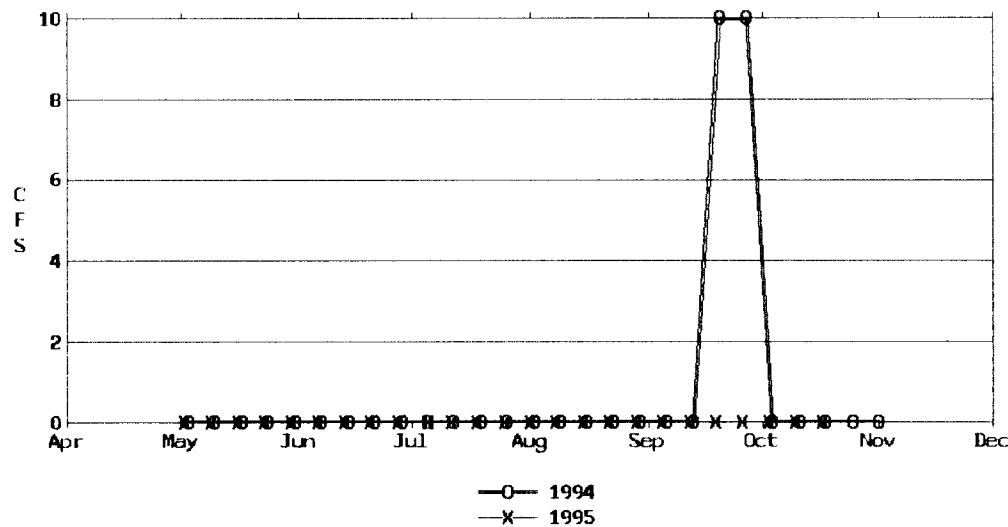


MAXIMUM POOL = 53638 AF AT 303.50 FEET (MAY 1)
 MINIMUM POOL = 33040 AF AT 283.50 FEET (NOV 1)
 ACTIVE CAPACITY = 0 AF AT 235.3 FEET

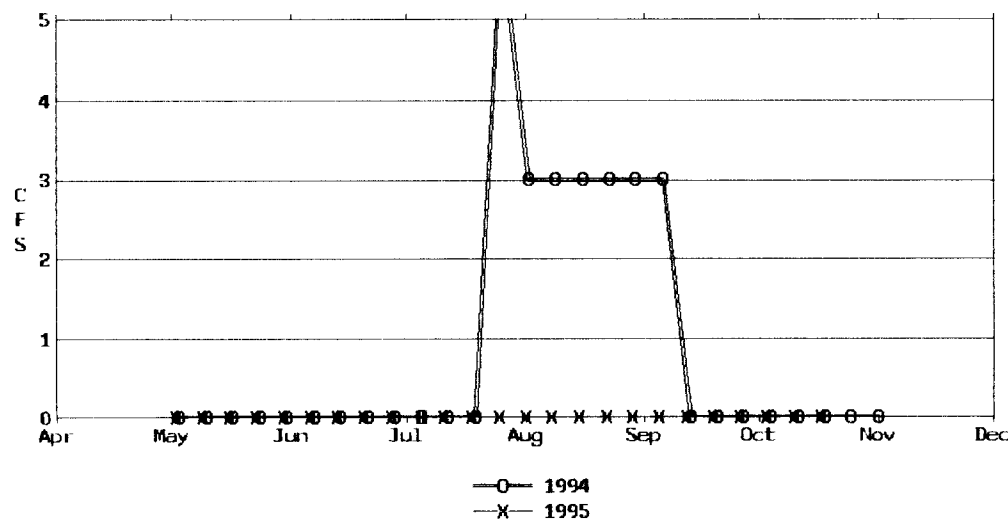
TRASK RELEASE TO TUALATIN RIVER (TRTR) RM 78.00



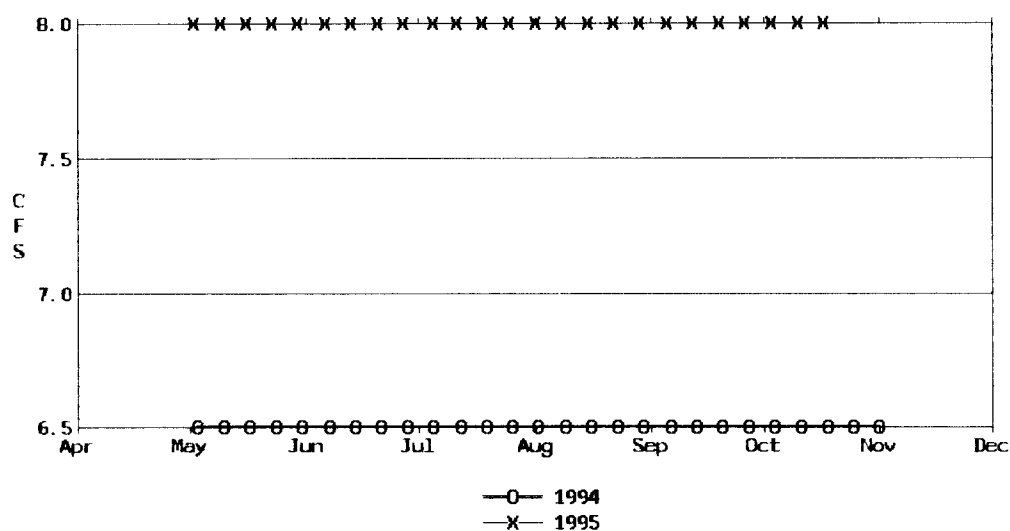
TRASK RELEASE FOR WATER QUALITY (TRWQ)



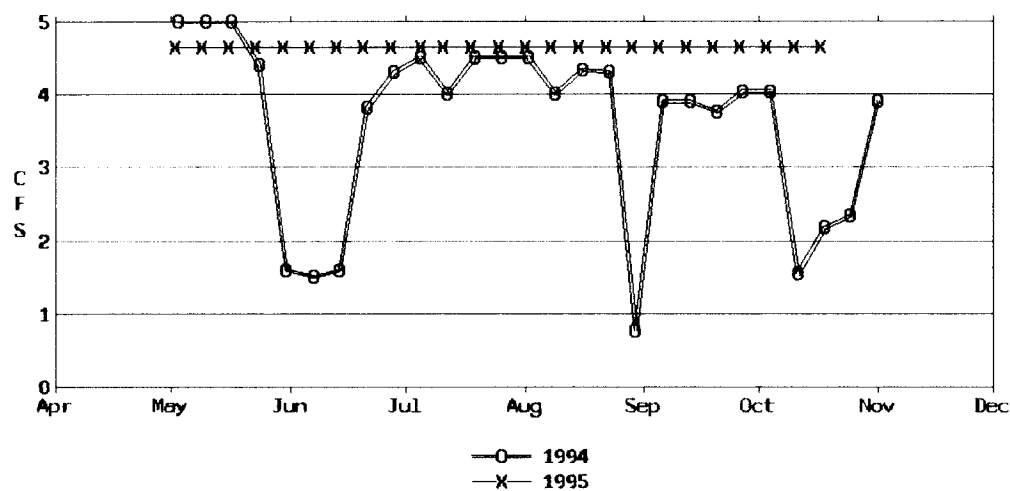
TRASK RELEASE FOR EXCHANGE (TRES)



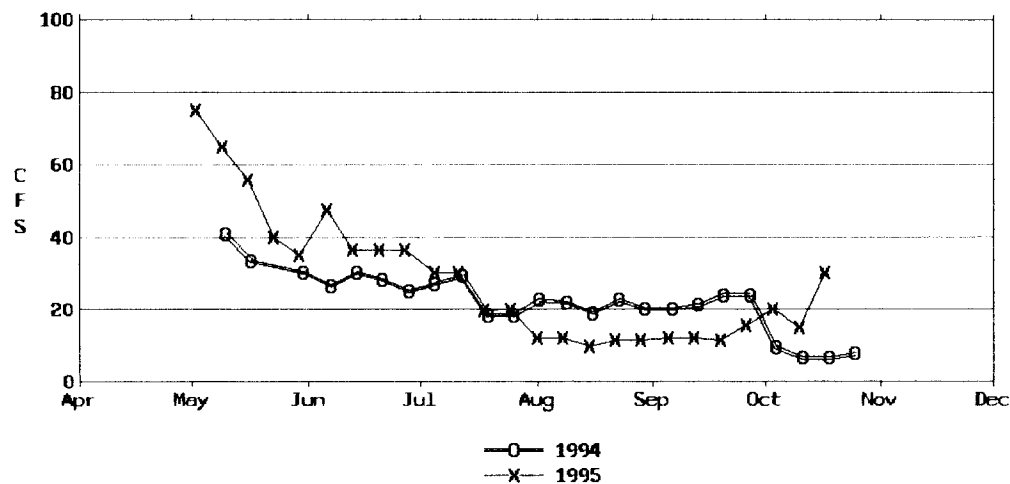
TRASK RELEASE TO NF TRASK RIVER (TRNF)



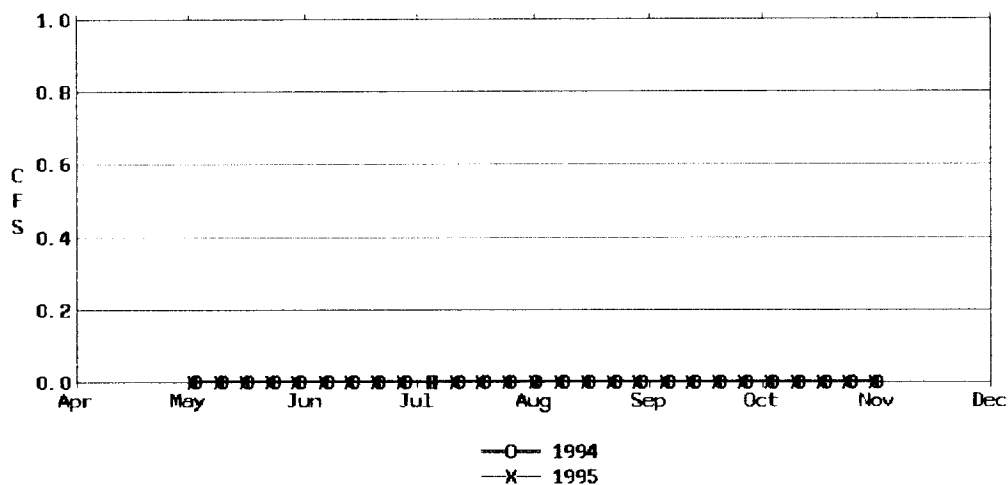
CHERRY GROVE INTAKE - HILLSBORO (CGIC) RM 73.30



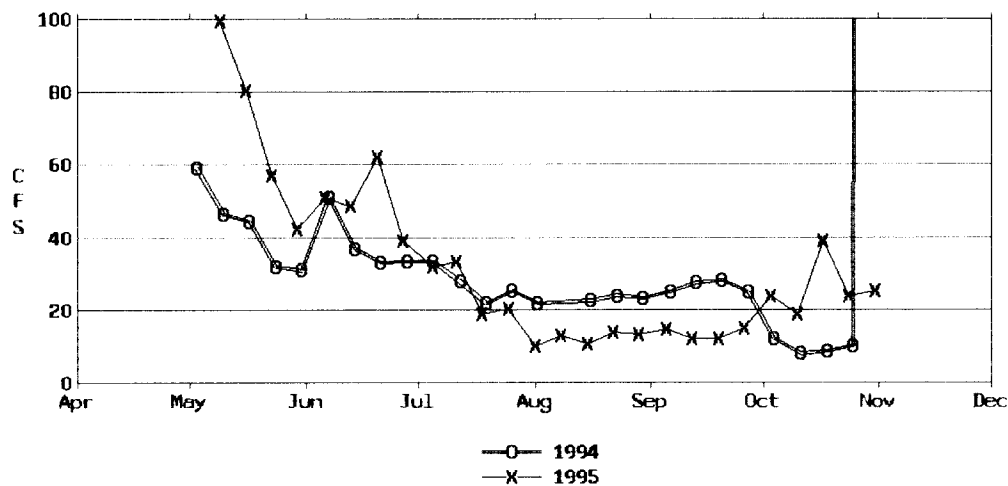
TUALATIN RIVER BELOW LEE FALLS (TRLF) RM 70.70



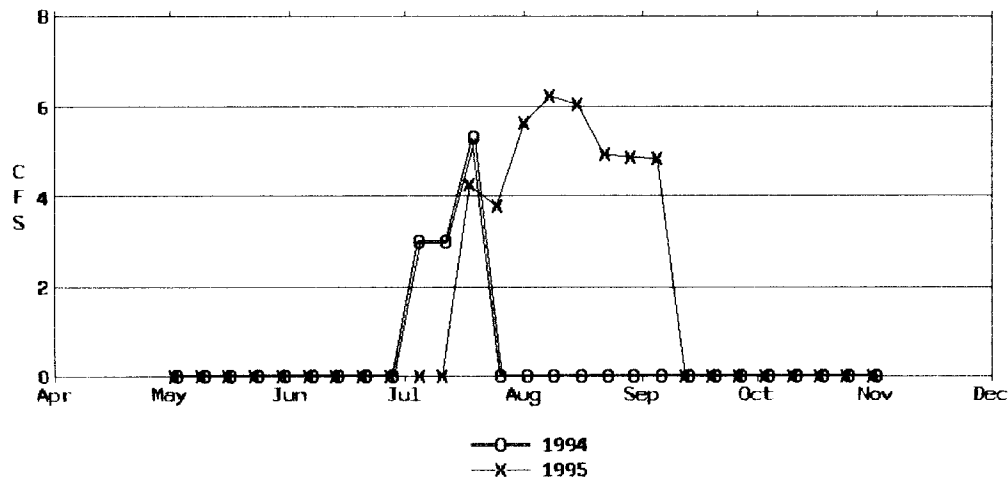
TVID - PATTON VALLEY RIV. TURNOUT #2 (PVR2) **RM 64.26**



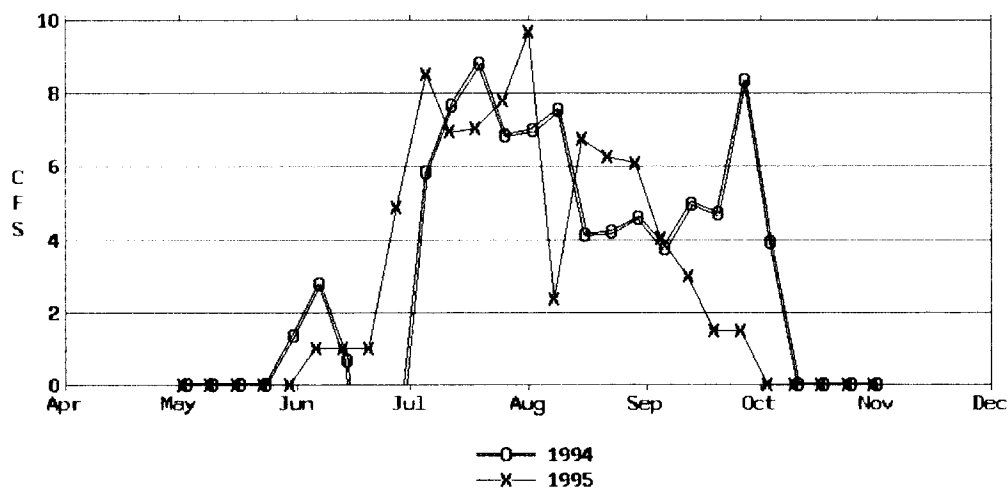
TUALATIN RIVER ABOVE GASTON (GAST) **RM 63.87**



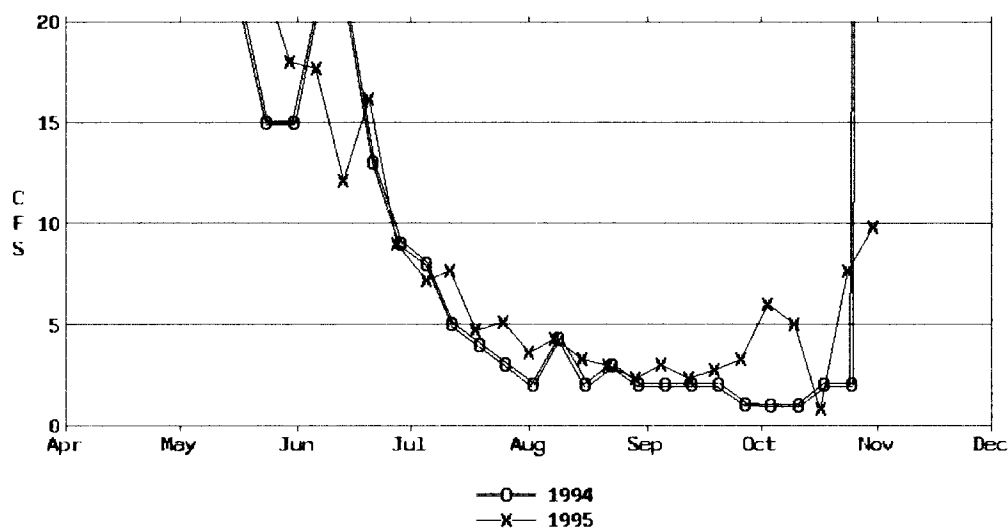
TVID - PATTON VALLEY RIV. TURNOUT #1 (PVR1) **RM 63.13**



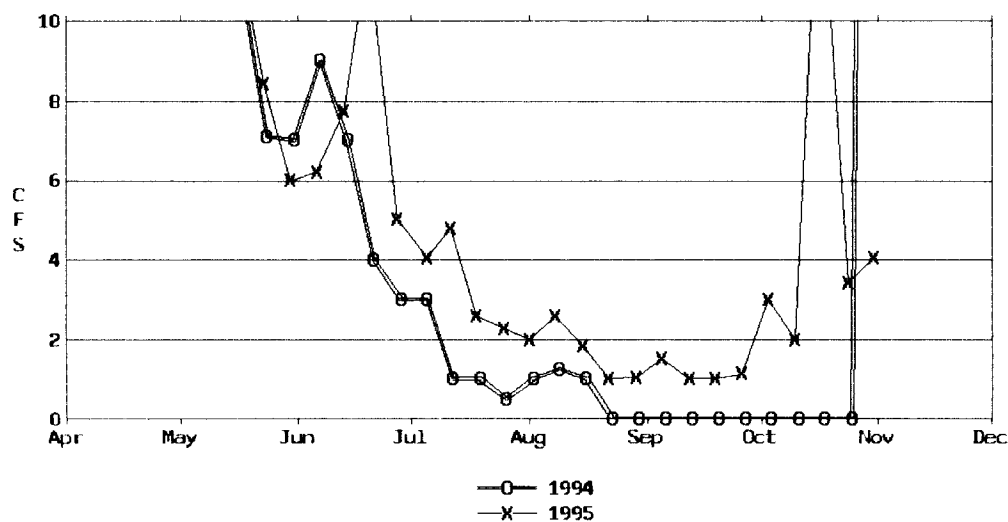
WAPATO CANAL DIVERSION (WAP0) **RM 62.00**



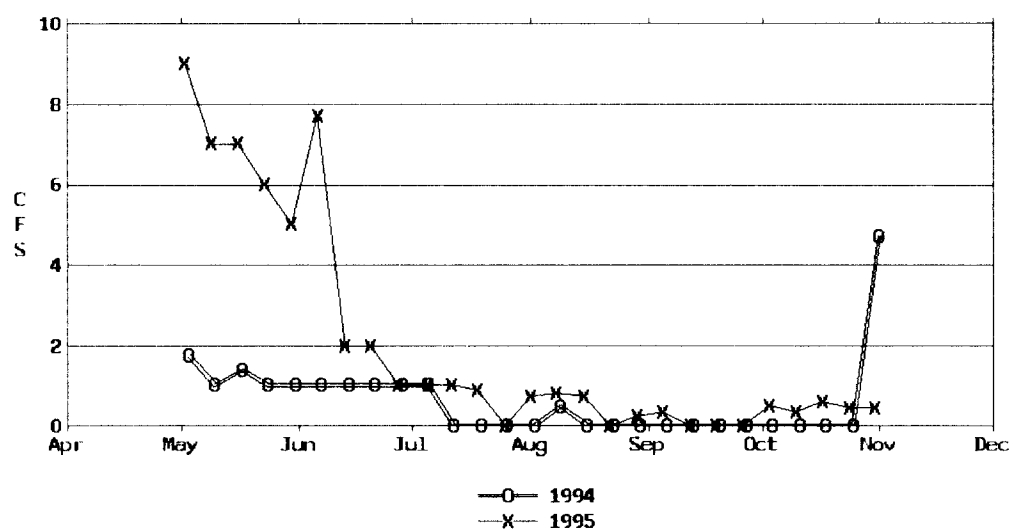
SCOGGIN CREEK ABOVE HAGG LAKE (SCLO)



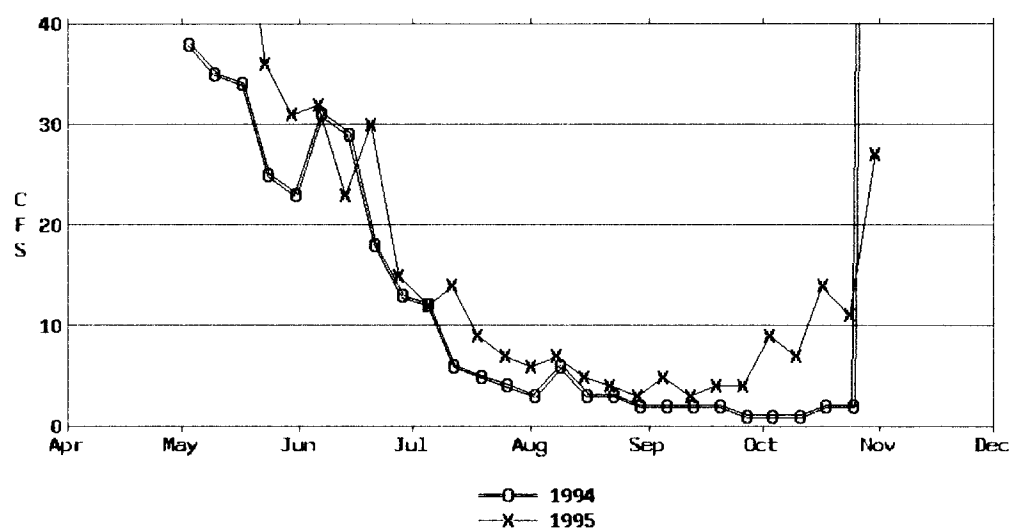
SAIN CREEK ABOVE HAGG LAKE (SCH0)



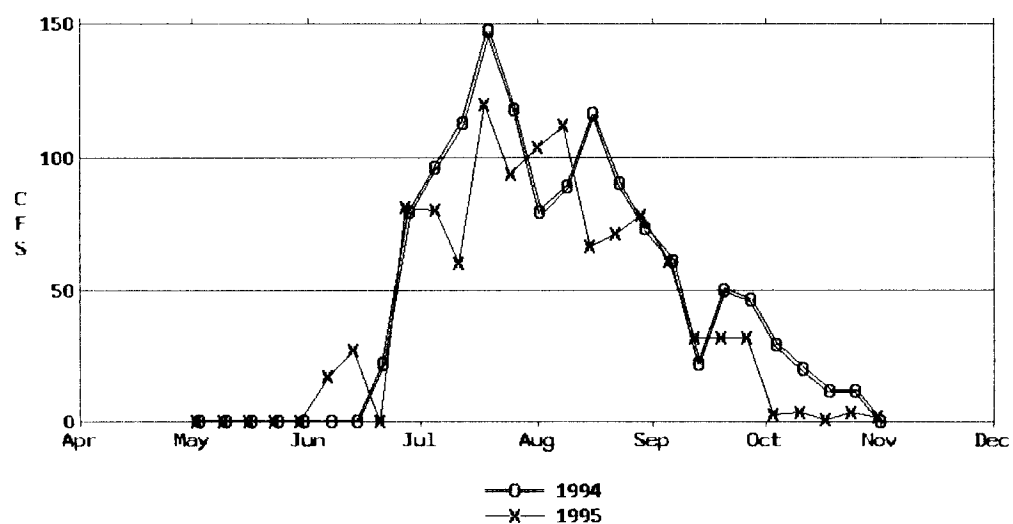
TANNER CREEK ABOVE HAGG LAKE (TANO)



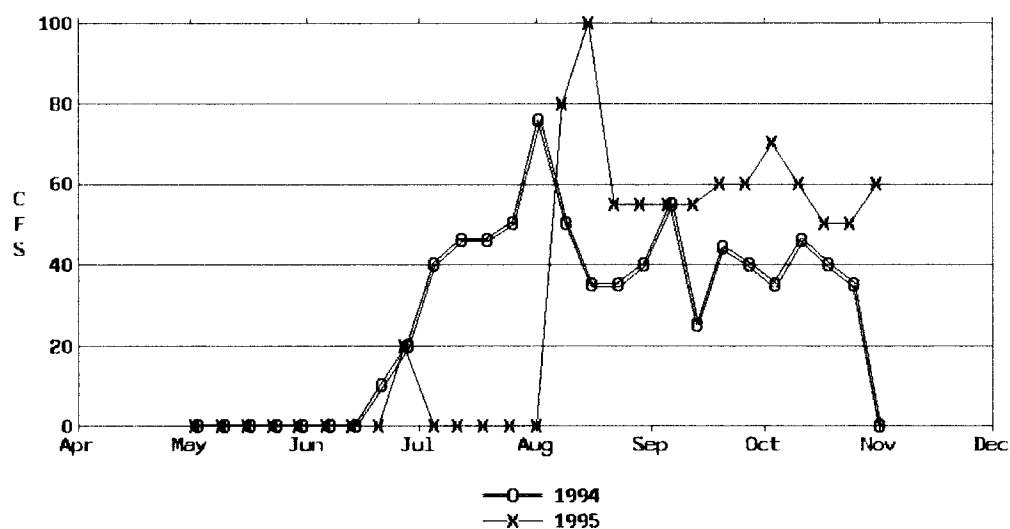
SCOGGINS RESERVOIR COMP. INFLOW (SRCI)



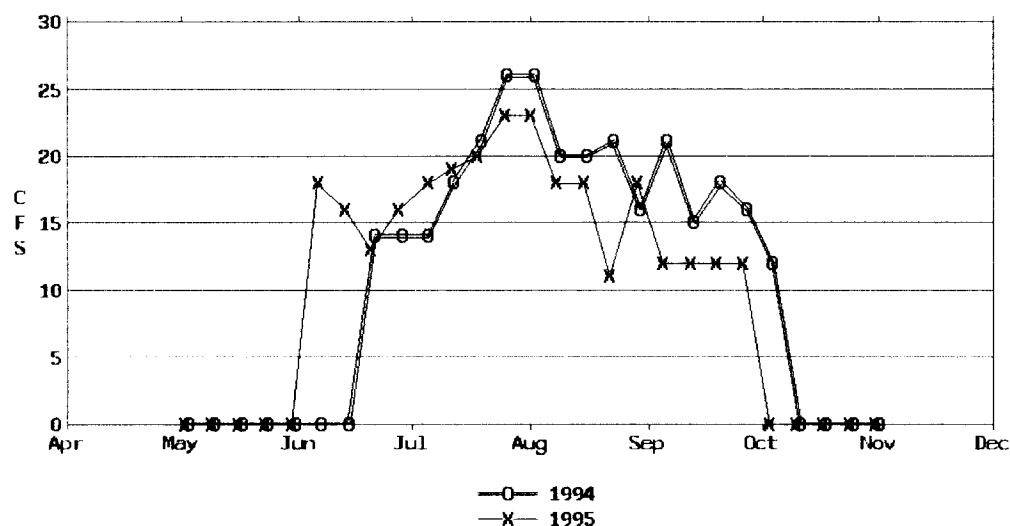
TVID RELEASE FROM SCOGGIN RES. (SRTV)



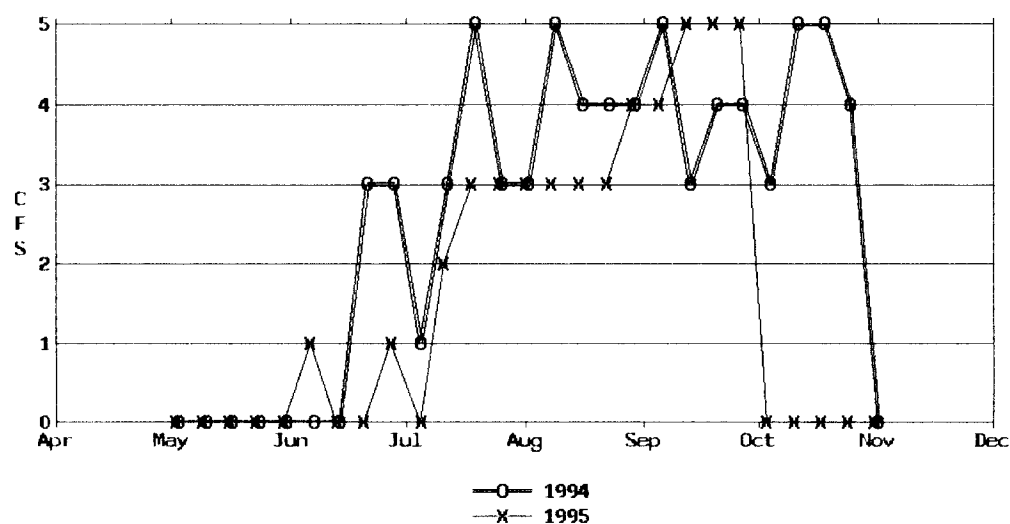
USA RELEASE FROM SCOGGIN RES. (SRUS)



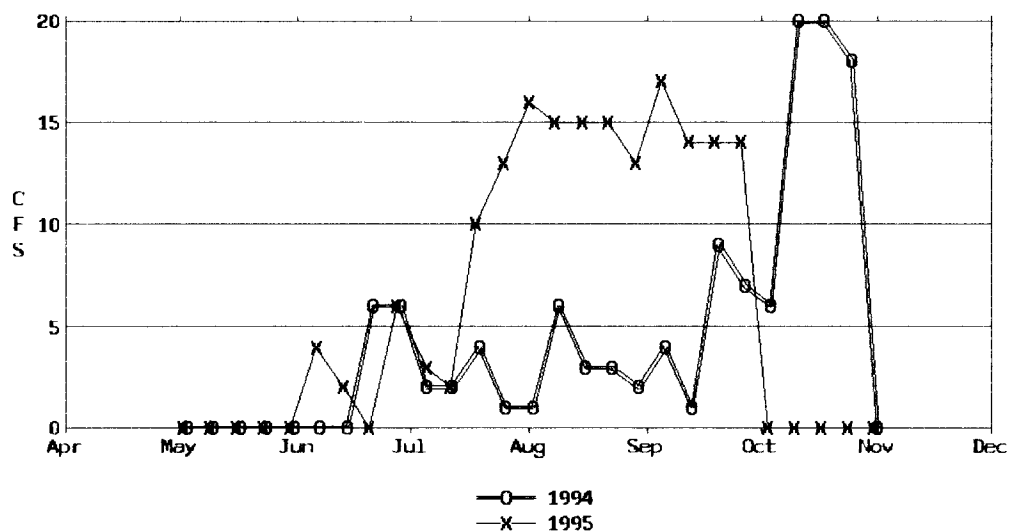
BEAVERTON RELEASE FROM SCOGGIN RES. (SRBV)



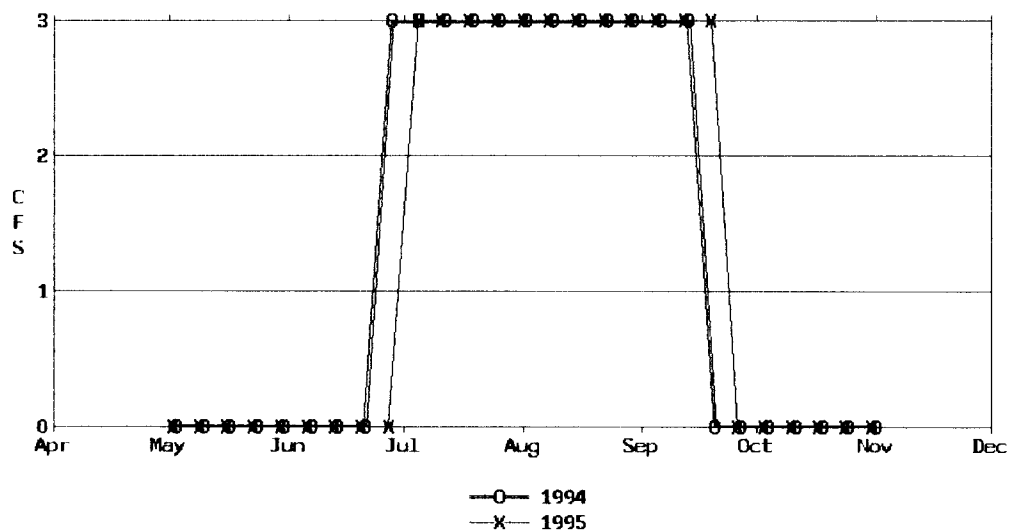
FOREST GROVE RELEASE FROM SCOG. RES. (SRFG)



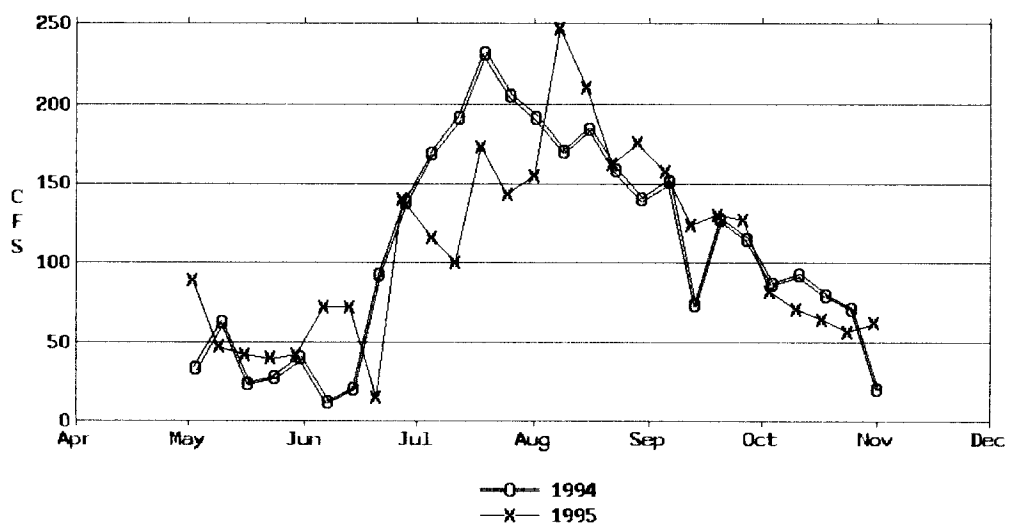
HILLSBORO RELEASE FROM SCOGGIN RES. (SRHL)



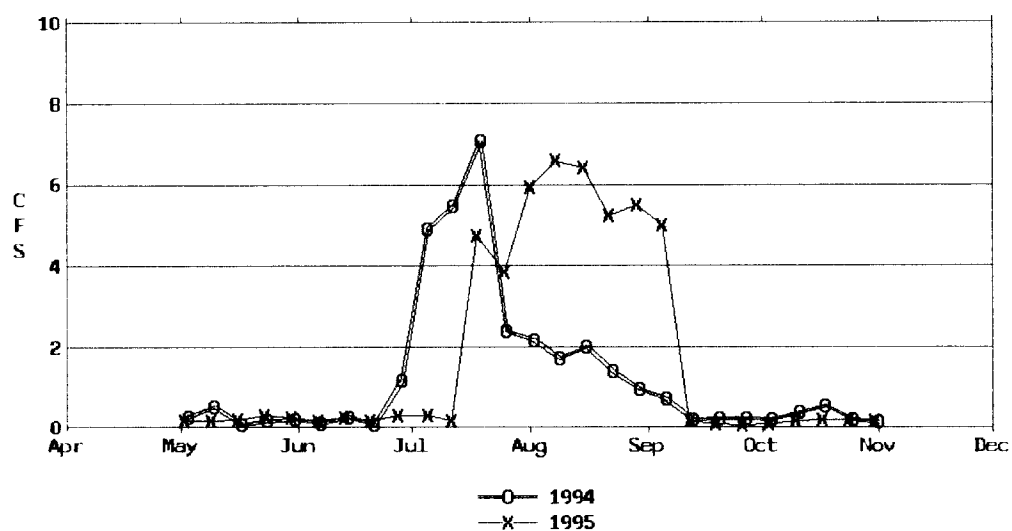
LOC RELEASE FROM SCOGGIN RES. (SRLO)



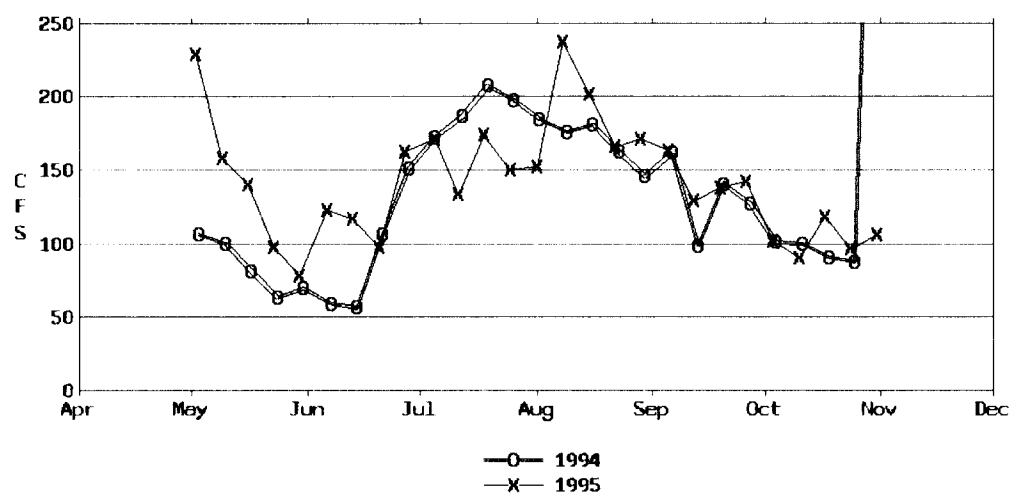
SCOGGIN CR. BELOW HAGG LAKE (RELEASE) (SC00)



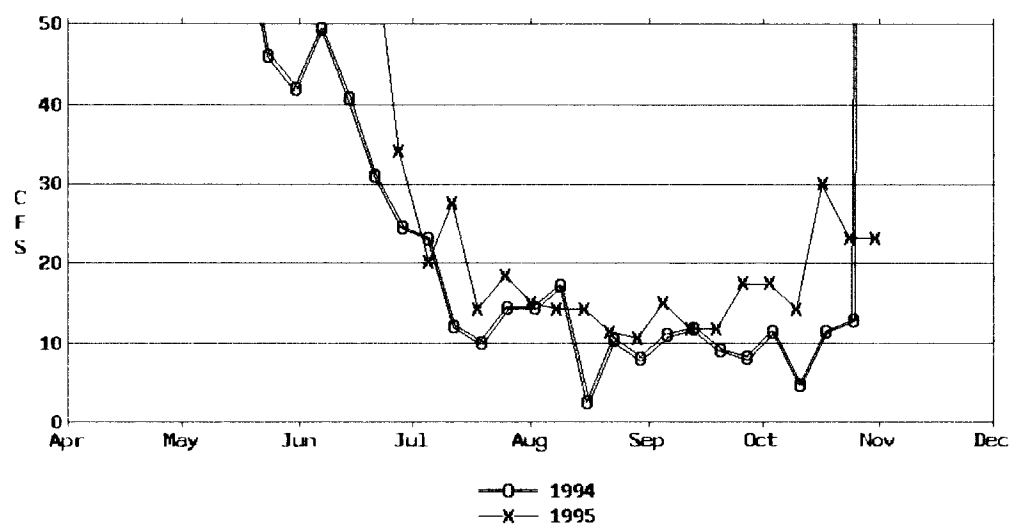
TVID - PATT. VALLEY PUMP PLANT DIV. (PVPP)



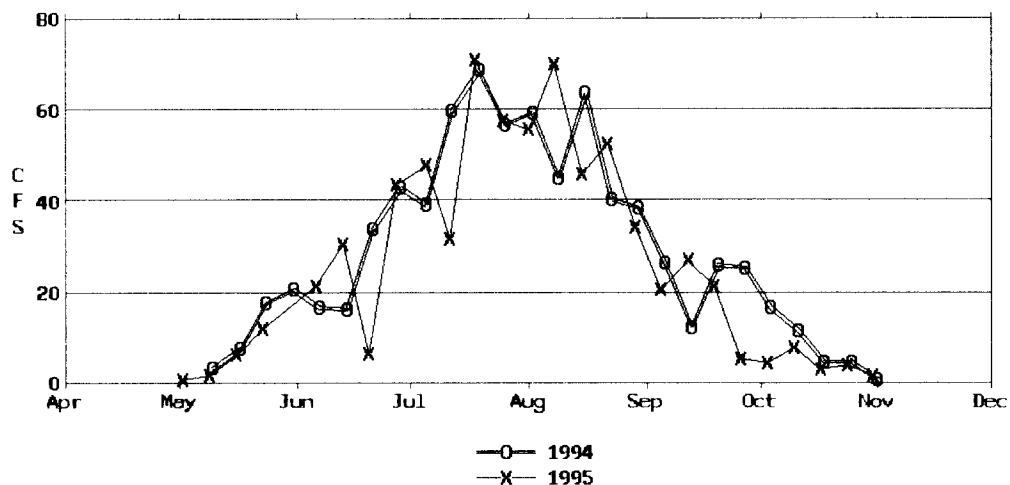
TUALATIN RIV. AT DILLEY BR. (DLLO) RM 58.82



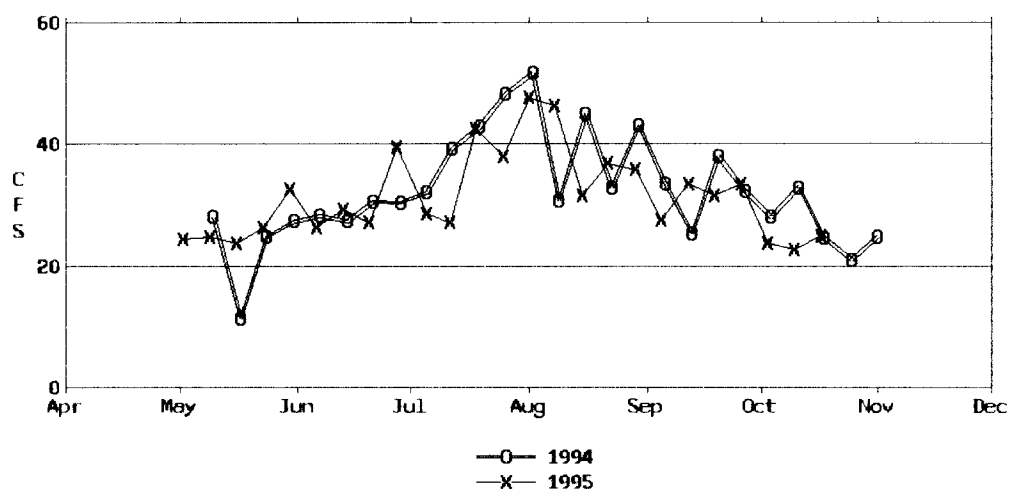
GALES CR. ON OLD HWY 47 BRIDGE (GALES)



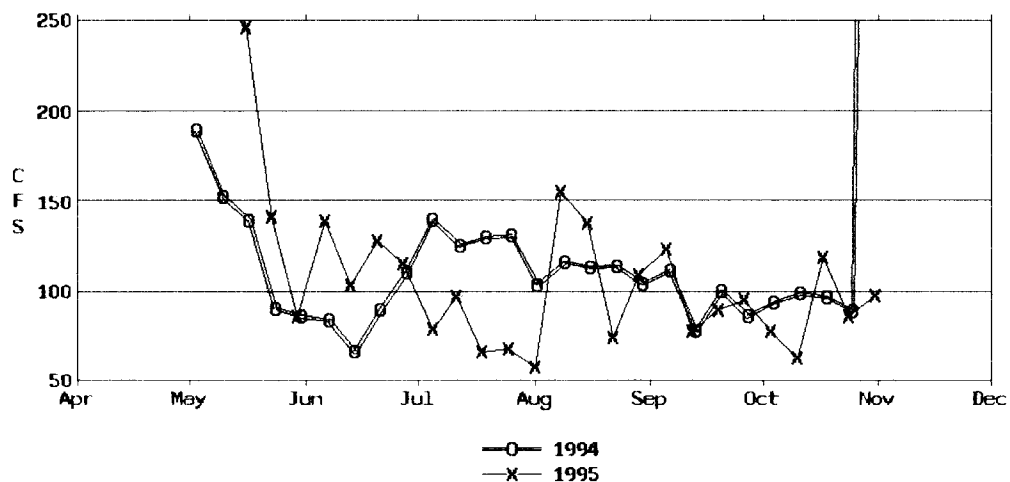
TVID - SPRINGHILL PUMP PLANT DIV. (SHPP) **RM 56.10**



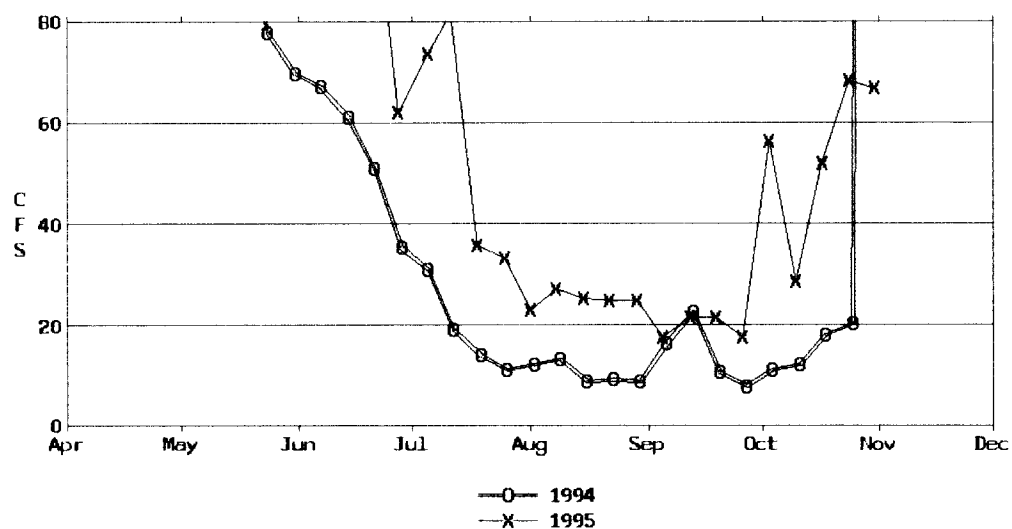
JOINT WATER DIVERSION AT SHPP PLANT (JWCS) **RM 56.10**



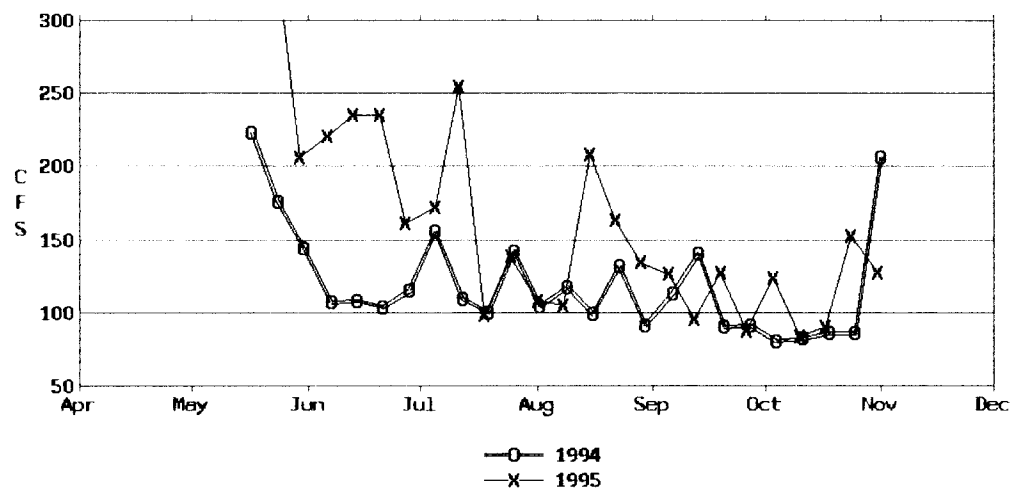
TUALATIN RIV. AT GOLF COURSE RD. (TRGC) **RM 51.54**



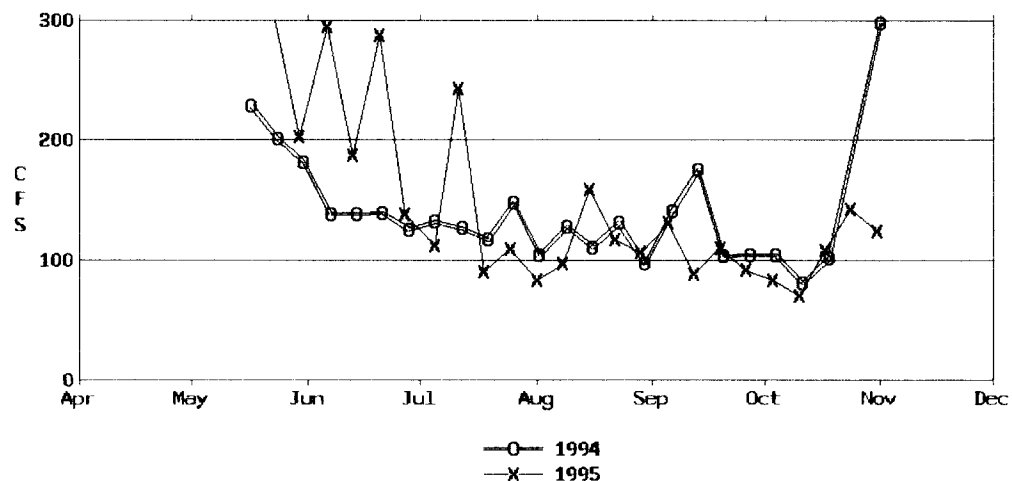
DAIRY CREEK AT HWY 8 BRIDGE (DAIRY)



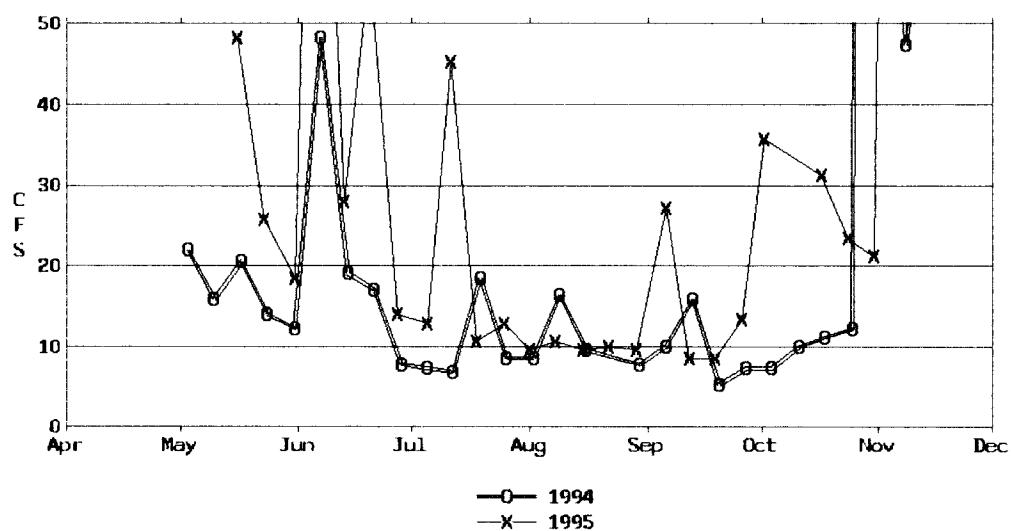
TUALATIN RIV. AT HWY 219 BRIDGE (TRJB) RM 44.40



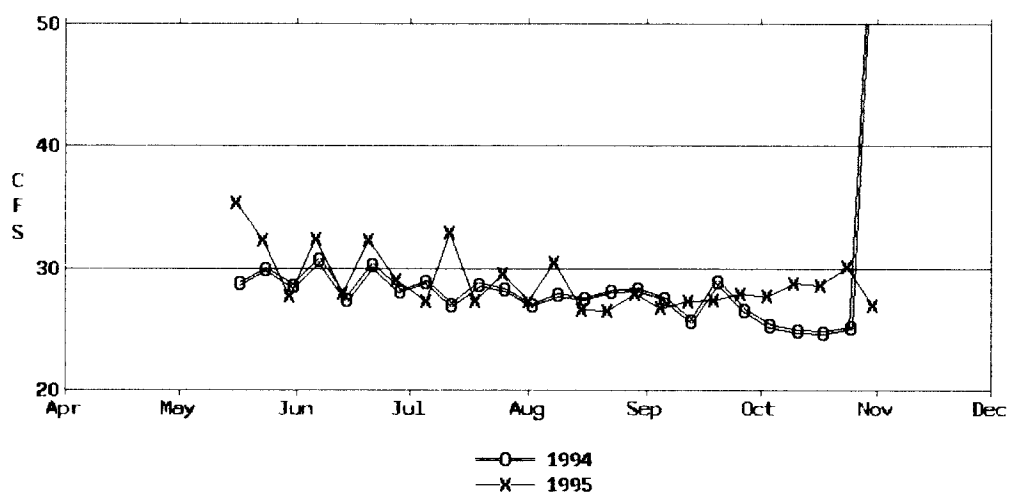
TUALATIN RIV. AT ROOD RD. BRIDGE (ROOD) RM 38.44



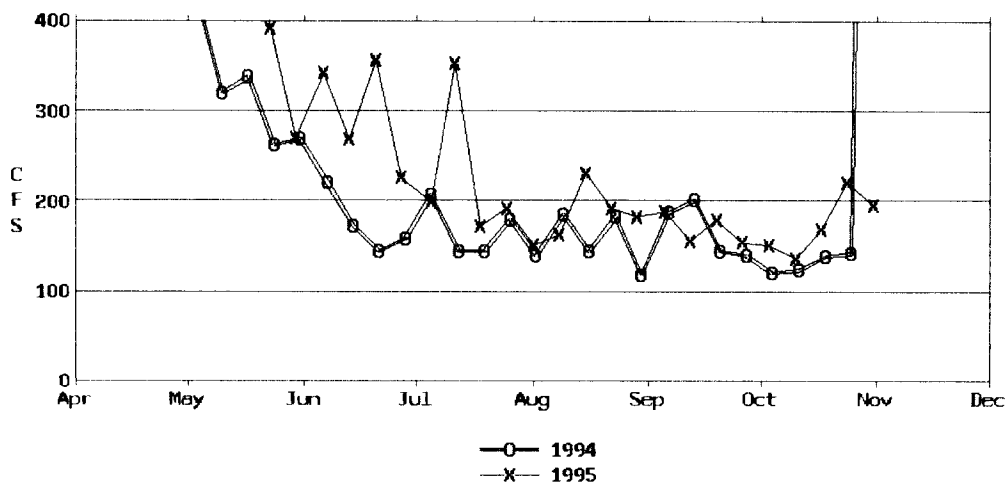
ROCK CREEK AT TV HWY (RCTV)



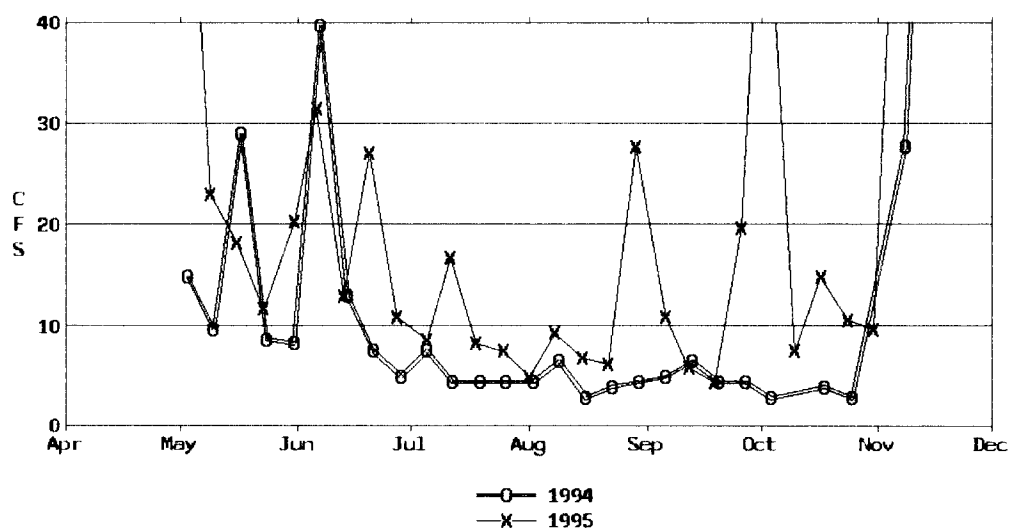
USA ROCK CREEK WWTP DISCHARGE (USARC) RM 38.08



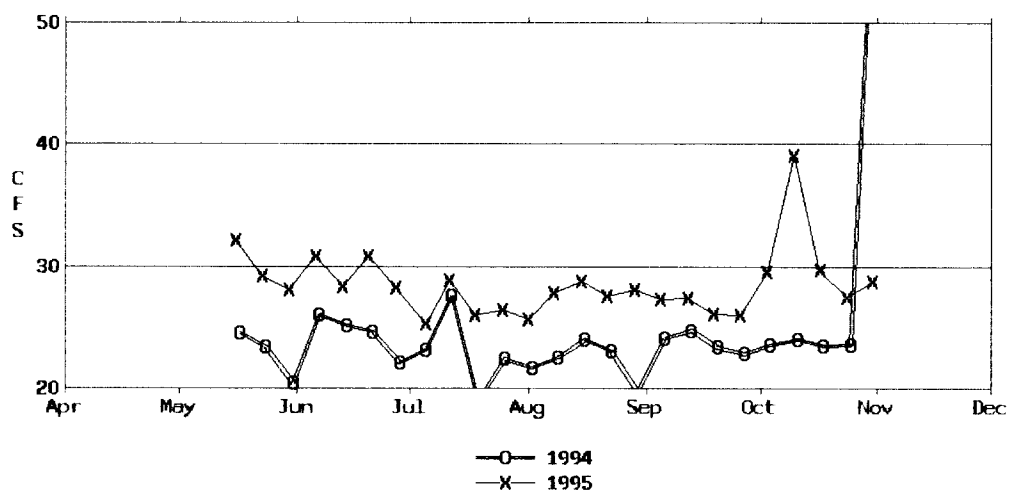
TUALATIN R. AT FARMINGTON RD. BRIDGE (FRMO) RM 33.30



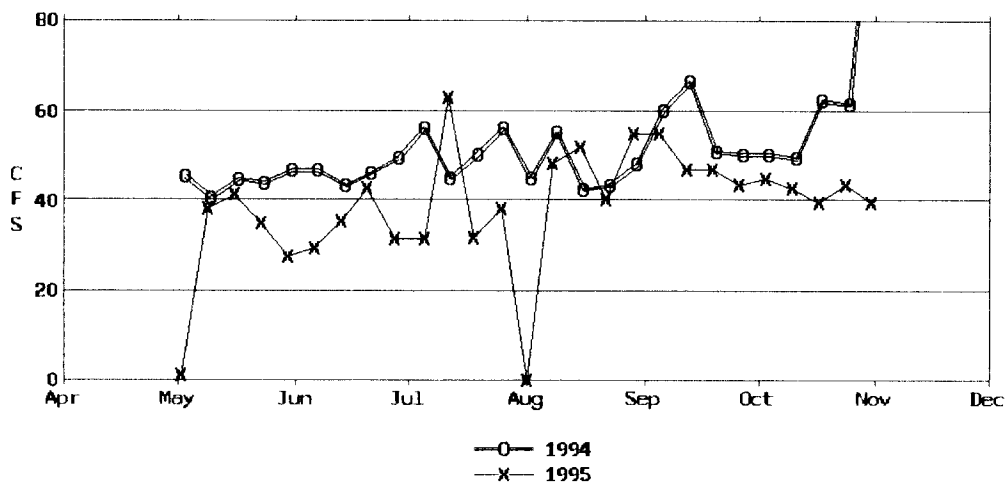
FANNO CREEK AT DURHAM RD. BRIDGE (FANO)



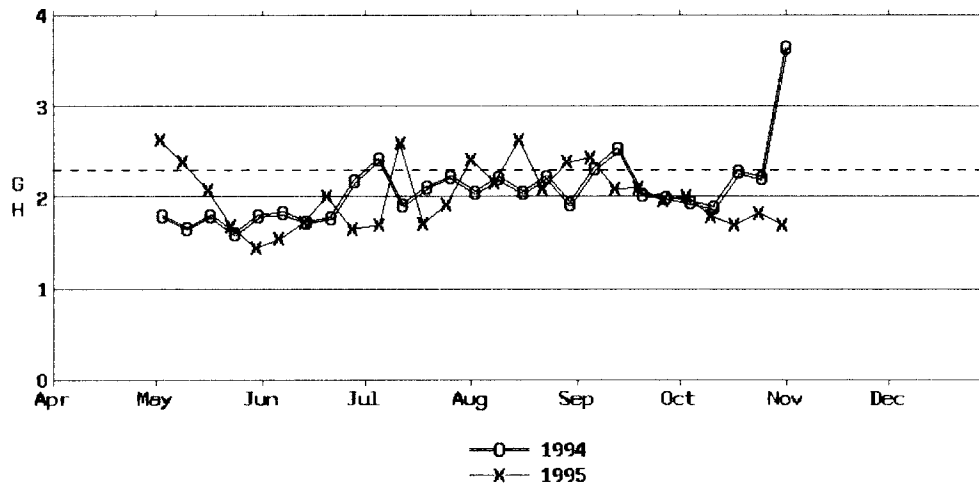
USA DURHAM WWTP DISCHARGE (USADH) RM 9.33



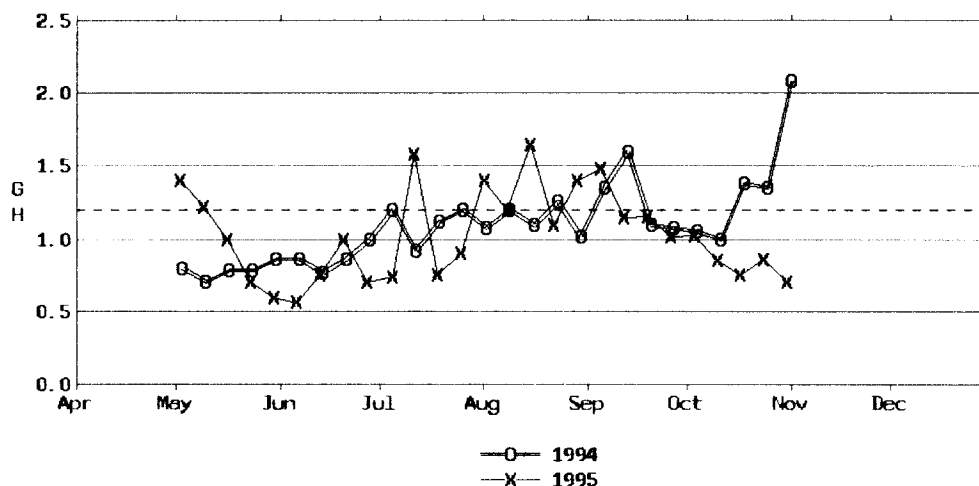
LAKE OSWEGO CORP. CANAL DIVERSION (LOCL) RM 6.70



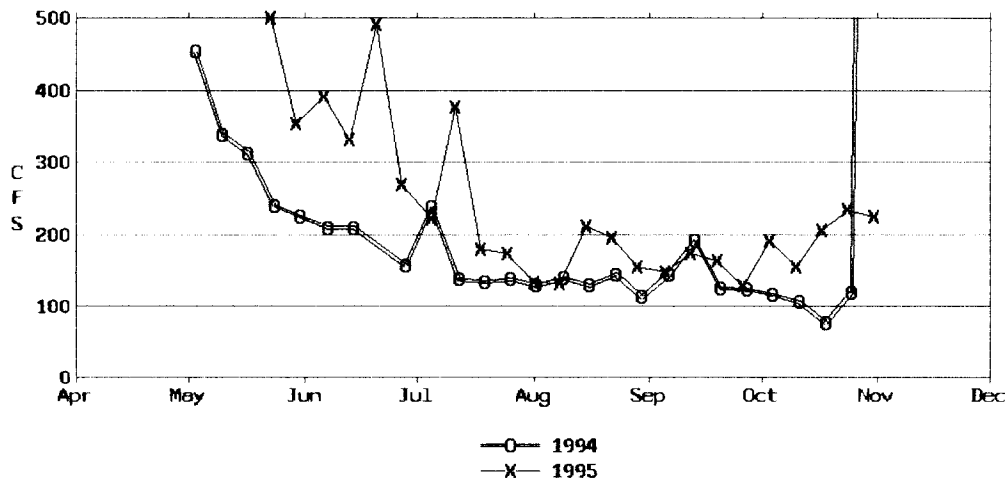
TUALATIN RIV. AT LOC CANAL (LOCS) **RM 6.70**



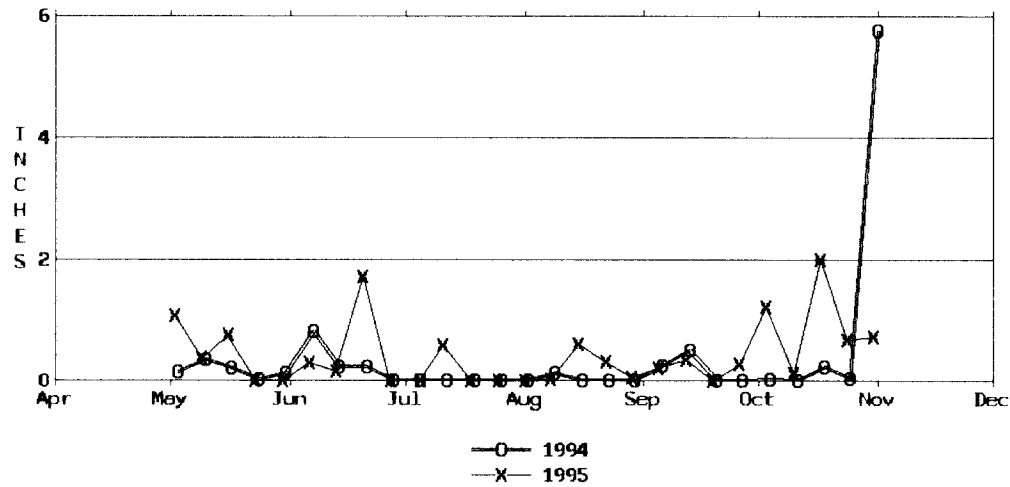
TUALATIN RIV. AT LOC DAM (LOCD) **RM 3.45**



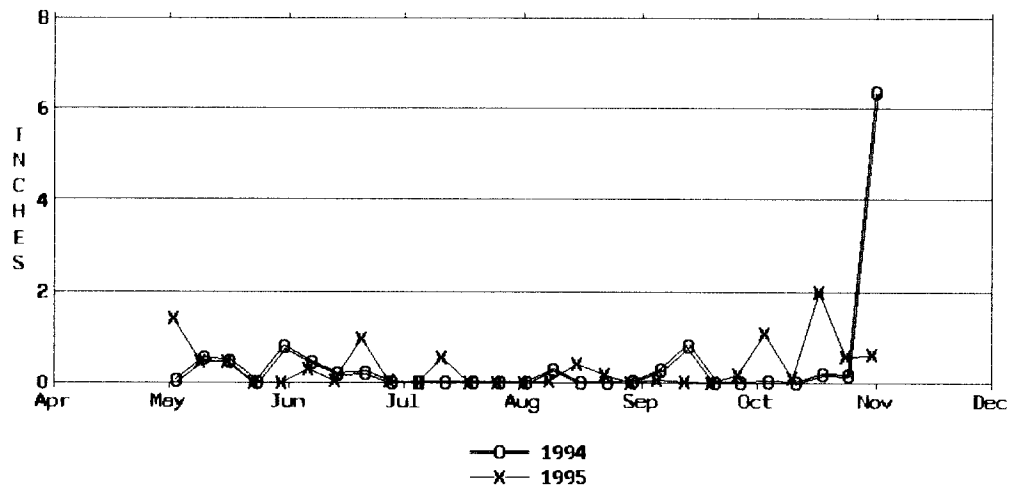
TUALATIN RIV. AT WEST LINN (WSLO) **RM 1.75**



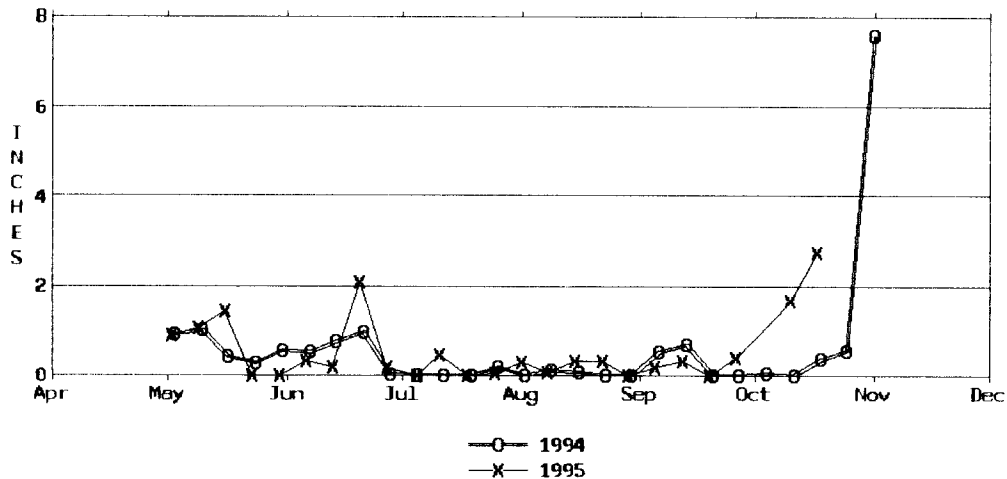
SCOGGIN RESERVOIR STATION (SCOP) PREVIOUS 7 DAYS ACCUMULATED PRECIPITATION



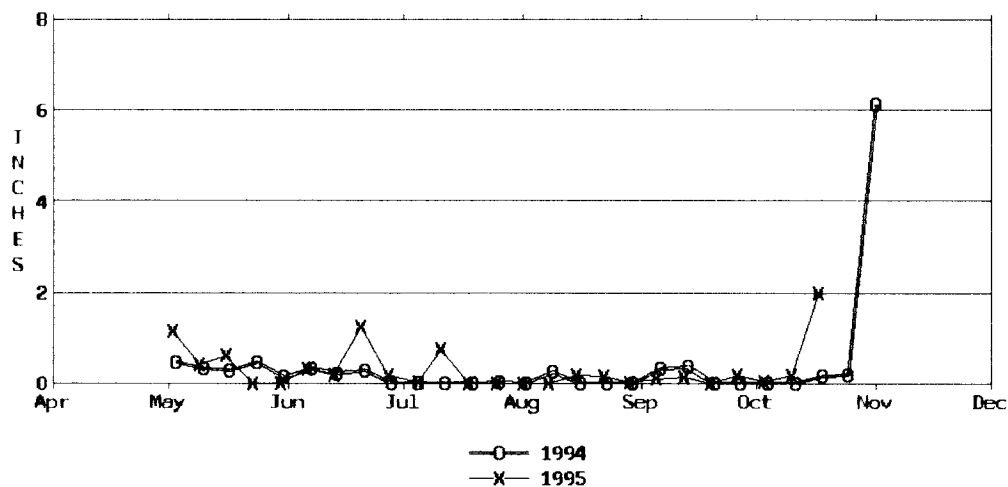
FOREST GROVE STATION (FGOP) PREVIOUS 7 DAYS ACCUMULATED PRECIPITATION



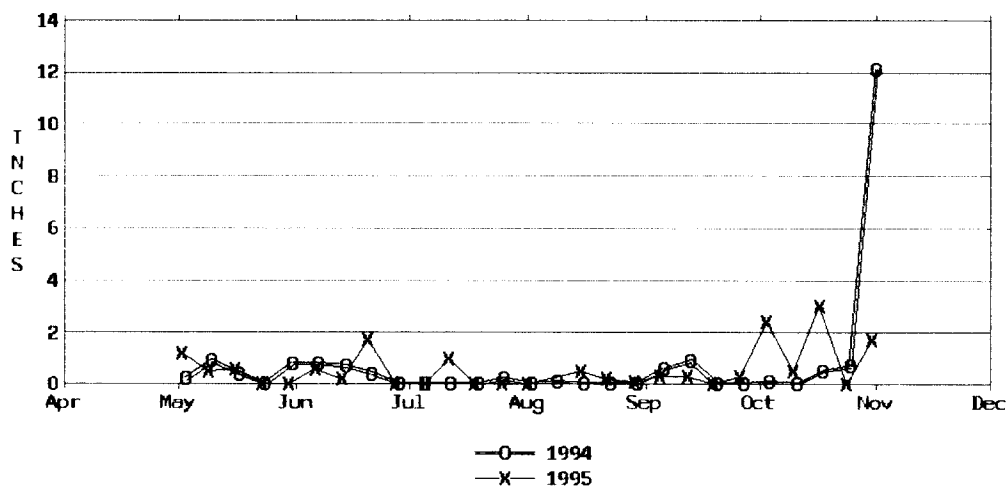
HAINES FALLS STATION (HFOP) PREVIOUS 7 DAYS ACCUMULATED PRECIPITATION



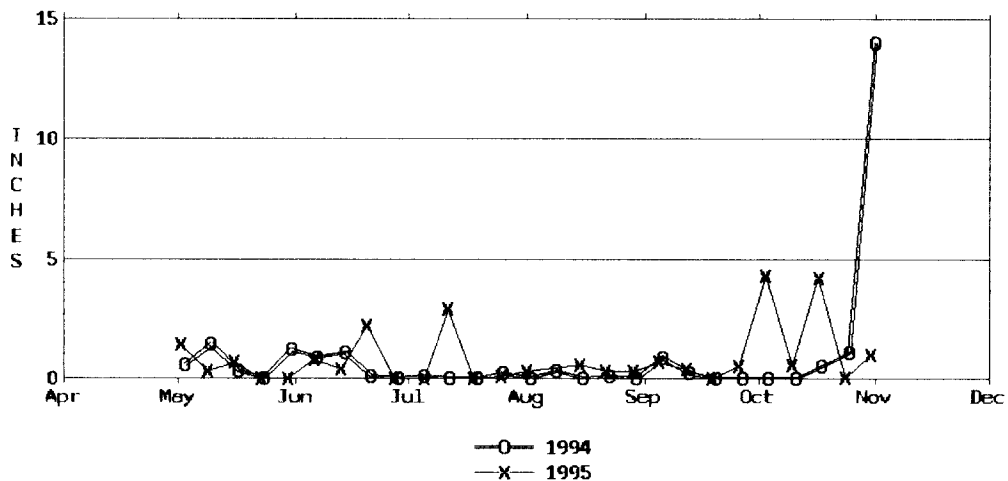
JOINT WATER PLANT STATION (JWOP) PREVIOUS 7 DAYS ACCUMULATED PRECIPITATION



SAIN CREEK STATION (SECO) PREVIOUS 7 DAYS ACCUMULATED PRECIPITATION



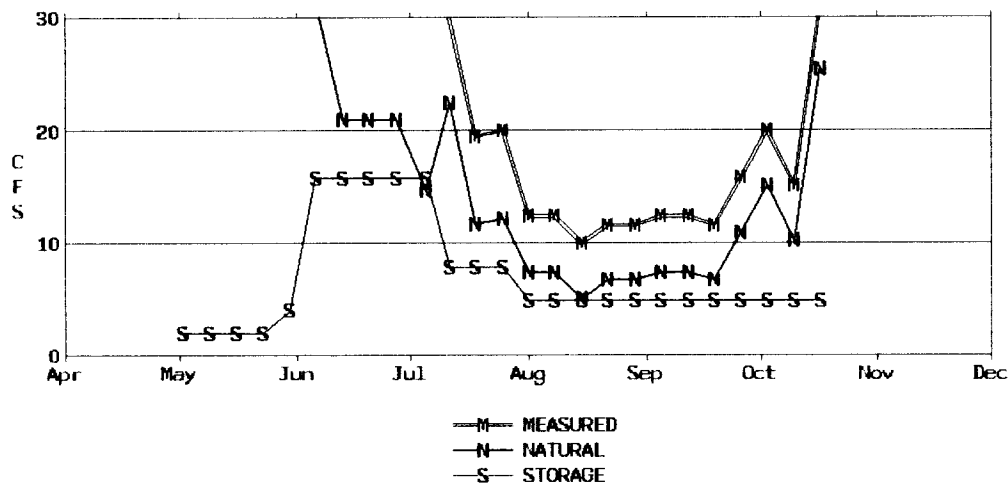
SADDLE MOUNTAIN STATION (SDMO) PREVIOUS 7 DAYS ACCUMULATED PRECIPITATION



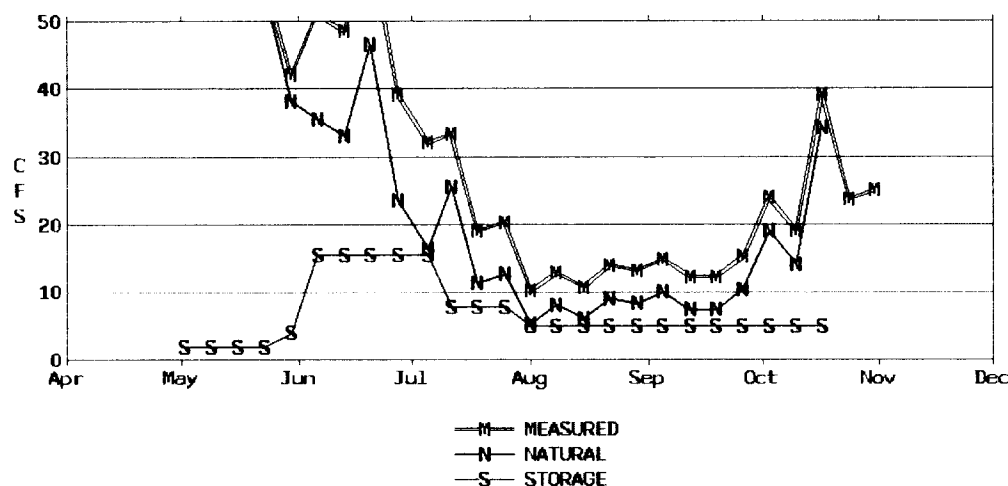
**Hydrographs for Natural Flow
Determination and Data Tables**

APPENDIX B

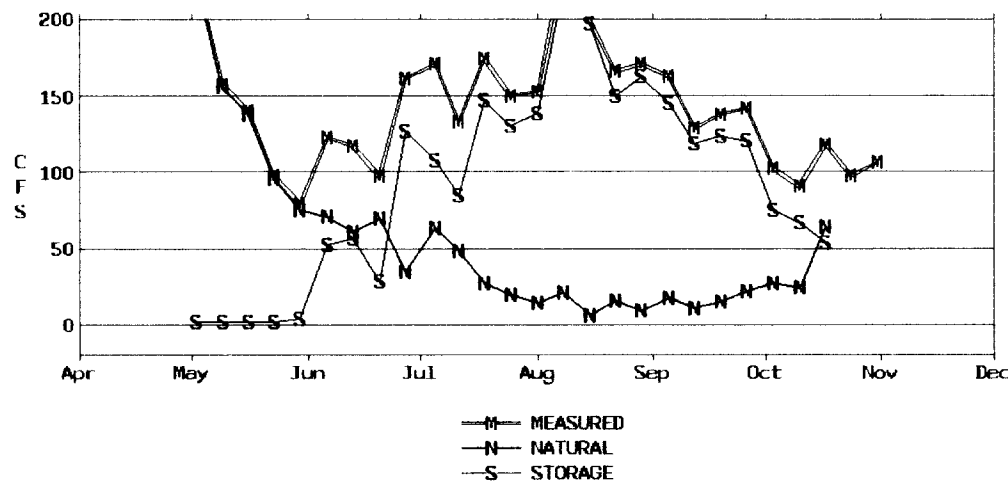
NATURAL FLOW AT LEE FALLS ON TUALATIN RIVER (NFTRLF) RM 70.70



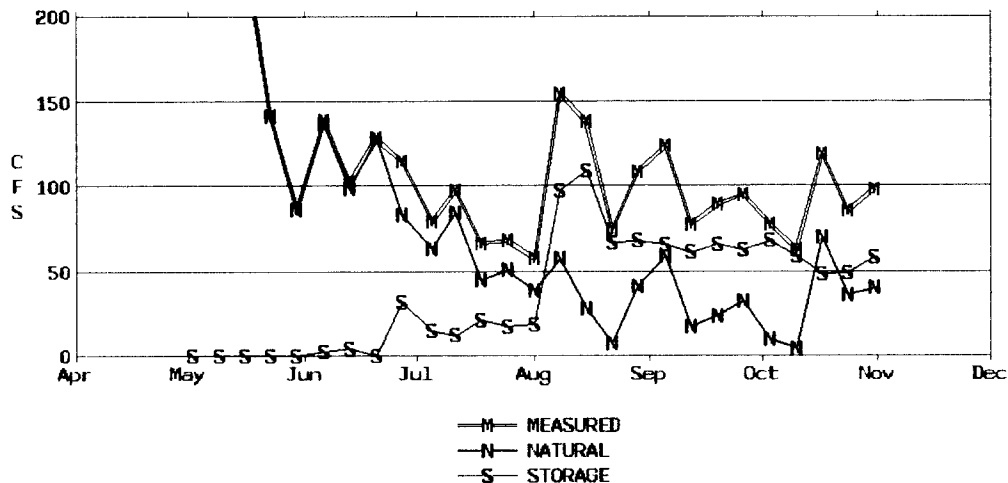
NATURAL FLOW AT GASTON GAUGE ON TUALATIN RIVER (NFGAST) RM 63.87



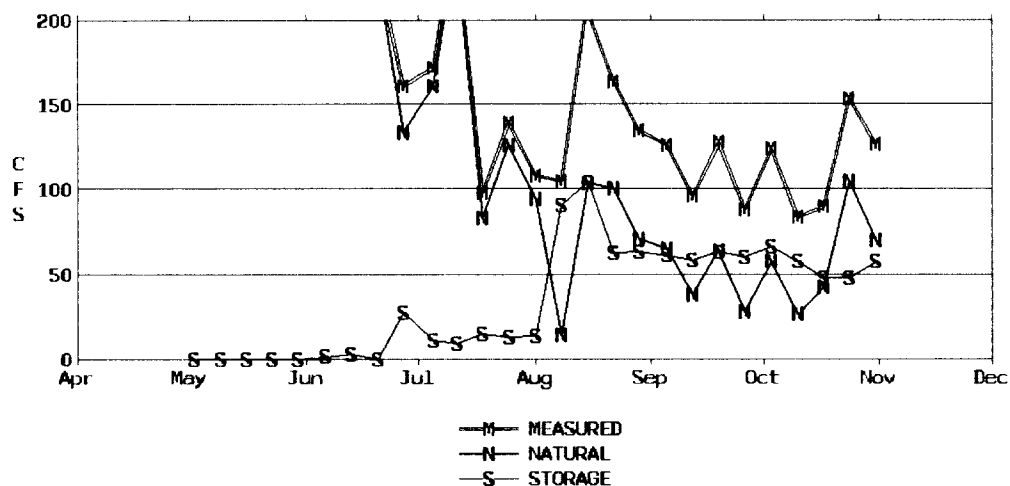
NATURAL FLOW AT DILLEY GAUGE ON TUALATIN RIVER (NFDLLO) RM 58.82



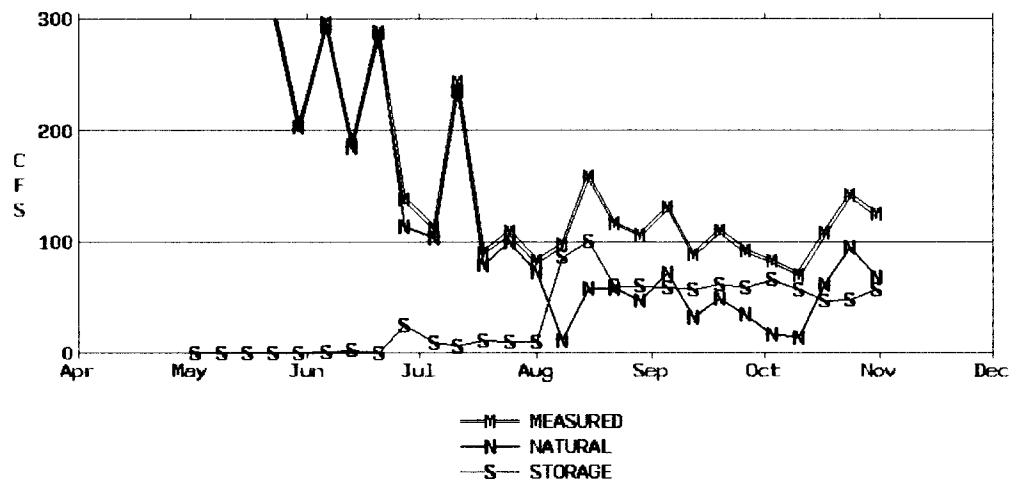
NATURAL FLOW AT GOLF COURSE BRIDGE GAUGE ON TUALATIN RIVER (NFTRGC) RM 51.54



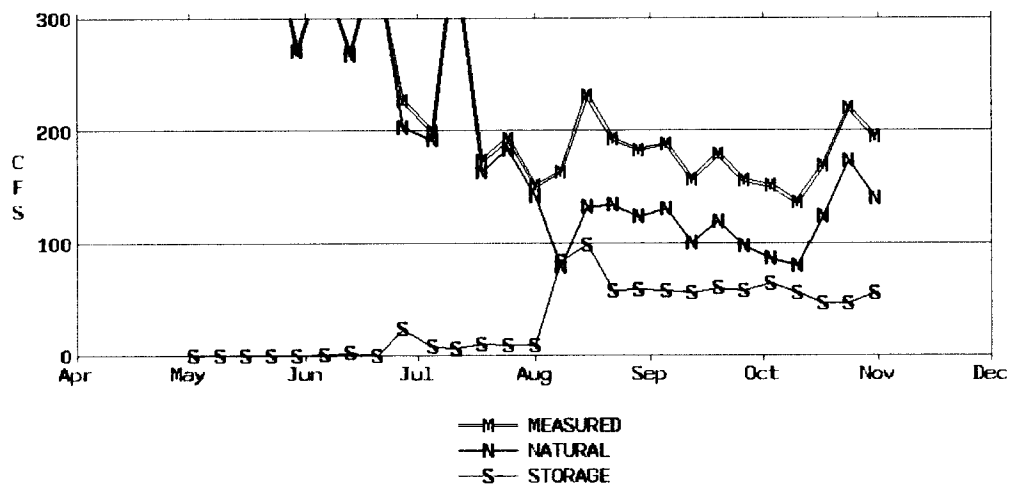
NATURAL FLOW AT HWY 219 BRIDGE GAUGE ON TUALATIN RIVER (NFTRJB) RM 44.40



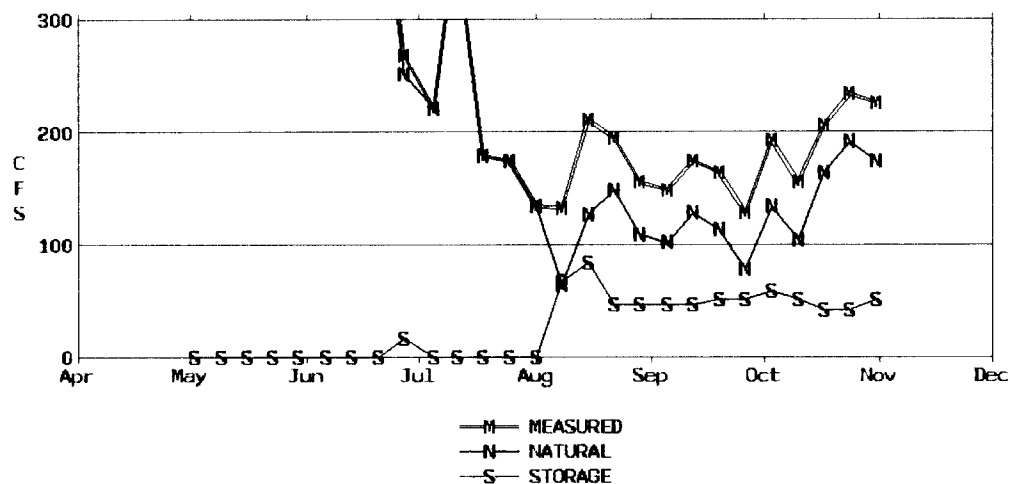
NATURAL FLOW AT ROOD BRIDGE RD. ON TUALATIN RIVER (NFR00D) RM 38.44



NATURAL FLOW AT FARMINGTON RD. BRIDGE ON TUALATIN RIVER (NFFRMO) RM 33.30



NATURAL FLOW AT WEST LINN ON TUALATIN RIVER (NFWSLO) RM 1.75



NATURAL FLOW
AT LEE FALLS ON TUALATIN RIVER

	NFTRLF	TRLF	STORAGE	TRTR	LOSS (2%)
02-MAY-95	73.24	75.20	1.96	2	0.04
09-MAY-95	63.04	65.00	1.96	2	0.04
16-MAY-95	53.84	55.80	1.96	2	0.04
23-MAY-95	38.04	40.00	1.96	2	0.04
30-MAY-95	31.28	35.20	3.92	4	0.08
31-MAY-95					
06-JUN-95	31.82	47.50	15.68	16	0.32
13-JUN-95	20.92	36.60	15.68	16	0.32
20-JUN-95	20.92	36.60	15.68	16	0.32
27-JUN-95	20.92	36.60	15.68	16	0.32
05-JUL-95	14.62	30.30	15.68	16	0.32
11-JUL-95	22.46	30.30	7.84	8	0.16
18-JUL-95	11.66	19.50	7.84	8	0.16
25-JUL-95	12.16	20.00	7.84	8	0.16
01-AUG-95	7.40	12.30	4.90	5	0.10
08-AUG-95	7.40	12.30	4.90	5	0.10
15-AUG-95	5.03	9.93	4.90	5	0.10
22-AUG-95	6.70	11.60	4.90	5	0.10
29-AUG-95	6.70	11.60	4.90	5	0.10
05-SEP-95	7.40	12.30	4.90	5	0.10
06-SEP-95					
12-SEP-95	7.40	12.30	4.90	5	0.10
19-SEP-95	6.70	11.60	4.90	5	0.10
26-SEP-95	10.90	15.80	4.90	5	0.10
02-OCT-95					
03-OCT-95	15.10	20.00	4.90	5	0.10
10-OCT-95	10.20	15.10	4.90	5	0.10
17-OCT-95	25.40	30.30	4.90	5	0.10
24-OCT-95					
31-OCT-95					
07-NOV-95					
14-NOV-95					
28-NOV-95					

NFTRLF = TRLF - STORAGE
 WHERE STORAGE = TRTR - LOSS
 WHERE LOSS = TRTR * .02

NATURAL FLOW
AT GASTON GAUGE ON TUALATIN RIVER

	NFGAST	GAST	STORAGE	TRTR	LOSS (3%)	PVR2
02-MAY-95	129.06	131.0	1.94	2	0.06	0
09-MAY-95	97.36	99.3	1.94	2	0.06	0
16-MAY-95	78.36	80.3	1.94	2	0.06	0
23-MAY-95	55.06	57.0	1.94	2	0.06	0
30-MAY-95	38.12	42.0	3.88	4	0.12	0
31-MAY-95						
06-JUN-95	35.38	50.9	15.52	16	0.48	0
13-JUN-95	32.98	48.5	15.52	16	0.48	0
20-JUN-95	46.58	62.1	15.52	16	0.48	0
27-JUN-95	23.58	39.1	15.52	16	0.48	0
05-JUL-95	16.48	32.0	15.52	16	0.48	0
11-JUL-95	25.64	33.4	7.76	8	0.24	0
18-JUL-95	11.34	19.1	7.76	8	0.24	0
25-JUL-95	12.64	20.4	7.76	8	0.24	0
01-AUG-95	5.35	10.2	4.85	5	0.15	0
08-AUG-95	8.05	12.9	4.85	5	0.15	0
15-AUG-95	5.95	10.8	4.85	5	0.15	0
22-AUG-95	9.15	14.0	4.85	5	0.15	0
29-AUG-95	8.35	13.2	4.85	5	0.15	0
05-SEP-95	10.05	14.9	4.85	5	0.15	0
06-SEP-95						
12-SEP-95	7.45	12.3	4.85	5	0.15	0
19-SEP-95	7.45	12.3	4.85	5	0.15	0
26-SEP-95	10.35	15.2	4.85	5	0.15	0
02-OCT-95						
03-OCT-95	19.15	24.0	4.85	5	0.15	0
10-OCT-95	14.15	19.0	4.85	5	0.15	0
17-OCT-95	34.25	39.1	4.85	5	0.15	0
24-OCT-95		23.7				0
31-OCT-95		25.1				0
07-NOV-95						
14-NOV-95						
28-NOV-95						

NFGAST = GAST - STORAGE

WHERE STORAGE = (TRTR - LOSS) + PVR2

WHERE LOSS = TRTR * .03

NATURAL FLOW
AT DILLEY GAUGE ON TUALATIN RIVER

	NFDLLO	DLLO	STORAGE	TRTR	SRUS	SRTV	SRHL	SRFG	SRLO	SRBV
02-MAY-95	227.0700	229.0	1.9300	2	0	0	0	0	0	0
09-MAY-95	156.0700	158.0	1.9300	2	0	0	0	0	0	0
16-MAY-95	138.0700	140.0	1.9300	2	0	0	0	0	0	0
23-MAY-95	95.0700	97.0	1.9300	2	0	0	0	0	0	0
30-MAY-95	74.5400	78.4	3.8600	4	0	0	0	0	0	0
31-MAY-95										
06-JUN-95	70.6005	123.0	52.3995	16	0	17	4	1	0	18
13-JUN-95	60.7405	117.0	56.2595	16	0	27	2	0	0	16
20-JUN-95	69.4150	97.4	27.9850	16	0	0	0	0	0	13
27-JUN-95	34.7165	162.0	127.2835	16	20	81	6	1	0	16
05-JUL-95	62.9200	171.0	108.0800	16	0	80	3	0	3	18
11-JUL-95	48.0800	133.0	84.9200	8	0	60	2	2	3	19
18-JUL-95	27.3200	174.0	146.6800	8	0	120	10	3	3	20
25-JUL-95	20.1110	150.0	129.8890	8	0	94	13	3	3	23
01-AUG-95	14.4260	153.0	138.5740	5	0	104	16	3	3	23
08-AUG-95	21.0680	238.0	216.9320	5	80	112	15	3	3	18
15-AUG-95	5.7190	202.0	196.2810	5	100	66	15	3	3	18
22-AUG-95	15.5565	166.0	150.4435	5	55	71	15	3	3	11
29-AUG-95	8.6870	171.0	162.3130	5	55	78	13	4	3	18
05-SEP-95	17.3815	163.0	145.6185	5	55	61	17	4	3	12
06-SEP-95										
12-SEP-95	10.4980	129.0	118.5020	5	55	32	14	5	3	12
19-SEP-95	14.6730	138.0	123.3270	5	60	32	14	5	3	12
26-SEP-95	21.5680	142.0	120.4320	5	60	32	14	5	0	12
02-OCT-95										
03-OCT-95	27.0195	102.0	74.9805	5	70	3	0	0	0	0
10-OCT-95	23.8010	90.0	66.1990	5	60	4	0	0	0	0
17-OCT-95	64.0565	118.0	53.9435	5	50	1	0	0	0	0
24-OCT-95		96.8			50	4	0	0	0	0
31-OCT-95		106.0			60	2	0	0	0	0
07-NOV-95										
14-NOV-95										
28-NOV-95										

NFDLLO = DLLO - STORAGE

WHERE STORAGE = (TRTR + SRUS + (SRTV*.90) + SRHL + SRFG + SRLO + SRBV) - LOSS

WHERE LOSS = (TRTR + SRUS + (SRTV*.90) + SRHL + SRFG + SRLO + SRBV) * .035

NATURAL FLOW
AT DILLEY GAUGE ON TUALATIN RIVER

LOSS (3.5%)

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-----
02-MAY-95      0.0700
09-MAY-95      0.0700
16-MAY-95      0.0700
23-MAY-95      0.0700
30-MAY-95      0.1400
31-MAY-95
06-JUN-95      1.9005
13-JUN-95      2.0405
20-JUN-95      1.0150
27-JUN-95      4.6165
05-JUL-95      3.9200
11-JUL-95      3.0800
18-JUL-95      5.3200
25-JUL-95      4.7110
01-AUG-95      5.0260
08-AUG-95      7.8680
15-AUG-95      7.1190
22-AUG-95      5.4565
29-AUG-95      5.8870
05-SEP-95      5.2815
06-SEP-95
12-SEP-95      4.2980
19-SEP-95      4.4730
26-SEP-95      4.3680
02-OCT-95
03-OCT-95      2.7195
10-OCT-95      2.4010
17-OCT-95      1.9565
24-OCT-95
31-OCT-95
07-NOV-95
14-NOV-95
28-NOV-95

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NFDLLO = DLLO - STORAGE

WHERE STORAGE = (TRTR + SRUS + (SRTV*.90) + SRHL + SRFG + SRLO + SRBV) - LOSS

WHERE LOSS = (TRTR + SRUS + (SRTV*.90) + SRHL + SRFG + SRLO + SRBV) * .035

NATURAL FLOW
AT GOLF COURSE BRIDGE GAUGE ON T.R.

	NFTRGC	TRGC	STORAGE	SRUS	SRTV	SRLO	LOSS (3.4%)
02-MAY-95	486.00000	486.0	0.00000	0	0	0	0.00000
09-MAY-95	348.00000	348.0	0.00000	0	0	0	0.00000
16-MAY-95	246.00000	246.0	0.00000	0	0	0	0.00000
23-MAY-95	141.00000	141.0	0.00000	0	0	0	0.00000
30-MAY-95	86.00000	86.0	0.00000	0	0	0	0.00000
31-MAY-95							
06-JUN-95	136.37248	139.0	2.62752	0	17	0	0.09248
13-JUN-95	98.82688	103.0	4.17312	0	27	0	0.14688
20-JUN-95	128.00000	128.0	0.00000	0	0	0	0.00000
27-JUN-95	83.16064	115.0	31.83936	20	81	0	1.12064
05-JUL-95	63.73720	79.0	15.26280	0	80	3	0.53720
11-JUL-95	84.82840	97.0	12.17160	0	60	3	0.42840
18-JUL-95	44.85480	66.3	21.44520	0	120	3	0.75480
25-JUL-95	50.67336	68.1	17.42664	0	94	3	0.61336
01-AUG-95	38.52776	57.5	18.97224	0	104	3	0.66776
08-AUG-95	57.51128	155.0	97.48872	80	112	3	3.43128
15-AUG-95	28.30104	138.0	109.69896	100	66	3	3.86104
22-AUG-95	7.39824	74.4	67.00176	55	71	3	2.35824
29-AUG-95	40.91632	109.0	68.08368	55	78	3	2.39632
05-SEP-95	58.54384	124.0	65.45616	55	61	3	2.30384
06-SEP-95							
12-SEP-95	17.12608	78.1	60.97392	55	32	3	2.14608
19-SEP-95	23.49608	89.3	65.80392	60	32	3	2.31608
26-SEP-95	32.09408	95.0	62.90592	60	32	0	2.21408
02-OCT-95							
03-OCT-95	10.01632	78.1	68.08368	70	3	0	2.39632
10-OCT-95	4.22176	62.8	58.57824	60	4	0	2.06176
17-OCT-95	70.54544	119.0	48.45456	50	1	0	1.70544
24-OCT-95	36.58176	85.5	48.91824	50	4	0	1.72176
31-OCT-95	39.73088	98.0	58.26912	60	2	0	2.05088
07-NOV-95							
14-NOV-95							
28-NOV-95							

NFTRGC = TRGC - STORAGE

WHERE STORAGE = (SRUS + (SRTV * .16) + SRLO) - LOSS

WHERE LOSS = (SRUS + (SRTV * .16) + SRLO) * .034

NATURAL FLOW
AT HWY 219 BRIDGE GAUGE ON T.R.

	NFTRJB	TRJB	STORAGE	SRUS	SRTV	SRLO	LOSS (5.2%)
02-MAY-95			0.00000	0	0	0	0.00000
09-MAY-95			0.00000	0	0	0	0.00000
16-MAY-95	602.00000	602.0	0.00000	0	0	0	0.00000
23-MAY-95	358.00000	358.0	0.00000	0	0	0	0.00000
30-MAY-95	206.00000	206.0	0.00000	0	0	0	0.00000
31-MAY-95							
06-JUN-95	218.22724	220.0	1.77276	0	17	0	0.09724
13-JUN-95	232.18444	235.0	2.81556	0	27	0	0.15444
20-JUN-95	235.00000	235.0	0.00000	0	0	0	0.00000
27-JUN-95	133.59332	161.0	27.40668	20	81	0	1.50332
05-JUL-95	160.81360	172.0	11.18640	0	80	3	0.61360
11-JUL-95	244.89920	254.0	9.10080	0	60	3	0.49920
18-JUL-95	82.84240	98.2	15.35760	0	120	3	0.84240
25-JUL-95	126.35368	139.0	12.64632	0	94	3	0.69368
01-AUG-95	94.31088	108.0	13.68912	0	104	3	0.75088
08-AUG-95	14.63664	105.0	90.36336	80	112	3	4.95664
15-AUG-95	103.47352	208.0	104.52648	100	66	3	5.73352
22-AUG-95	100.61212	163.0	62.38788	55	71	3	3.42212
29-AUG-95	70.88216	134.0	63.11784	55	78	3	3.46216
05-SEP-95	64.65492	126.0	61.34508	55	61	3	3.36492
06-SEP-95							
12-SEP-95	37.57904	95.9	58.32096	55	32	3	3.19904
19-SEP-95	64.13904	127.2	63.06096	60	32	3	3.45904
26-SEP-95	27.78304	88.0	60.21696	60	32	0	3.30304
02-OCT-95							
03-OCT-95	57.32716	124.0	66.67284	70	3	0	3.65716
10-OCT-95	26.70288	84.0	57.29712	60	4	0	3.14288
17-OCT-95	42.49572	90.0	47.50428	50	1	0	2.60572
24-OCT-95	105.18288	153.0	47.81712	50	4	0	2.62288
31-OCT-95	69.91144	127.0	57.08856	60	2	0	3.13144
07-NOV-95							
14-NOV-95							
28-NOV-95							

NFTRJB = TRJB - STORAGE

WHERE STORAGE = (SRUS + (SRTV * .11) + SRLO) - LOSS

WHERE LOSS = (SRUS + (SRTV * .11) + SRLO) * .052

NATURAL FLOW
AT ROOD BRIDGE RD. ON T.R.

	NFROOD	ROOD	STORAGE	SRUS	SRLO	SRTV	LOSS (6.6%)
02-MAY-95	804.00000	804	0.00000	0	0	0	0.00000
09-MAY-95	686.00000	686	0.00000	0	0	0	0.00000
16-MAY-95	512.00000	512	0.00000	0	0	0	0.00000
23-MAY-95	311.00000	311	0.00000	0	0	0	0.00000
30-MAY-95	203.00000	203	0.00000	0	0	0	0.00000
31-MAY-95							
06-JUN-95	293.72976	295	1.27024	0	0	17	0.08976
13-JUN-95	184.98256	187	2.01744	0	0	27	0.14256
20-JUN-95	287.00000	287	0.00000	0	0	0	0.00000
27-JUN-95	113.26768	138	24.73232	20	0	81	1.74768
05-JUL-95	103.22040	112	8.77960	0	3	80	0.62040
11-JUL-95	235.71480	243	7.28520	0	3	60	0.51480
18-JUL-95	79.23160	91	11.76840	0	3	120	0.83160
25-JUL-95	99.17432	109	9.82568	0	3	94	0.69432
01-AUG-95	72.42712	83	10.57288	0	3	104	0.74712
08-AUG-95	11.10936	97	85.89064	80	3	112	6.06936
15-AUG-95	57.86648	159	101.13352	100	3	66	7.14648
22-AUG-95	57.52288	117	59.47712	55	3	71	4.20288
29-AUG-95	45.99984	106	60.00016	55	3	78	4.23984
05-SEP-95	71.27008	130	58.72992	55	3	61	4.15008
06-SEP-95							
12-SEP-95	31.43696	88	56.56304	55	3	32	3.99696
19-SEP-95	48.76696	110	61.23304	60	3	32	4.32696
26-SEP-95	33.56896	92	58.43104	60	0	32	4.12896
02-OCT-95							
03-OCT-95	17.39584	83	65.60416	70	0	3	4.63584
10-OCT-95	13.66112	70	56.33888	60	0	4	3.98112
17-OCT-95	61.22528	108	46.77472	50	0	1	3.30528
24-OCT-95	95.00112	142	46.99888	50	0	4	3.32112
31-OCT-95	67.81056	124	56.18944	60	0	2	3.97056
07-NOV-95							
14-NOV-95							
28-NOV-95							

NFROOD = ROOD - STORAGE

WHERE STORAGE = SRUS + SRLO + (SRTV * .08) - LOSS

WHERE LOSS = (SRUS + SRLO + (SRTV * .08)) * .066

NATURAL FLOW
AT FARMINGTON RD. BRIDGE ON T.R.

	NFFRMO	FRMO	STORAGE	SRUS	SRLO	SRTV	LOSS (8.0%)
02-MAY-95	977.0000	977	0.0000	0	0	0	0.0000
09-MAY-95	856.0000	856	0.0000	0	0	0	0.0000
16-MAY-95	652.0000	652	0.0000	0	0	0	0.0000
23-MAY-95	391.0000	391	0.0000	0	0	0	0.0000
30-MAY-95	271.0000	271	0.0000	0	0	0	0.0000
31-MAY-95							
06-JUN-95	341.9052	343	1.0948	0	0	17	0.0952
13-JUN-95	267.2612	269	1.7388	0	0	27	0.1512
20-JUN-95	356.0000	356	0.0000	0	0	0	0.0000
27-JUN-95	202.3836	226	23.6164	20	0	81	2.0536
05-JUL-95	191.0880	199	7.9120	0	3	80	0.6880
11-JUL-95	347.3760	354	6.6240	0	3	60	0.5760
18-JUL-95	162.5120	173	10.4880	0	3	120	0.9120
25-JUL-95	183.1864	192	8.8136	0	3	94	0.7664
01-AUG-95	141.5424	151	9.4576	0	3	104	0.8224
08-AUG-95	79.4272	163	83.5728	80	3	112	7.2672
15-AUG-95	131.9896	231	99.0104	100	3	66	8.6096
22-AUG-95	134.0676	192	57.9324	55	3	71	5.0376
29-AUG-95	123.6168	182	58.3832	55	3	78	5.0768
05-SEP-95	130.7116	188	57.2884	55	3	61	4.9816
06-SEP-95							
12-SEP-95	100.5792	156	55.4208	55	3	32	4.8192
19-SEP-95	118.9792	179	60.0208	60	3	32	5.2192
26-SEP-95	97.7392	155	57.2608	60	0	32	4.9792
02-OCT-95							
03-OCT-95	86.4068	151	64.5932	70	0	3	5.6168
10-OCT-95	80.5424	136	55.4576	60	0	4	4.8224
17-OCT-95	122.9356	169	46.0644	50	0	1	4.0056
24-OCT-95	173.7424	220	46.2576	50	0	4	4.0224
31-OCT-95	139.6712	195	55.3288	60	0	2	4.8112
07-NOV-95							
14-NOV-95							
28-NOV-95							

NFFRMO = FRMO - STORAGE

WHERE STORAGE = SRUS + SRLO + (SRTV * .07) - LOSS

WHERE LOSS = (SRUS + SRLO + (SRTV * .07)) * .080

NATURAL FLOW
AT WEST LINN ON TUALATIN RIVER

	NFWSLO	WSLO	STORAGE	SRUS	LOSS (16%)
02-MAY-95	1153.0	1153	0.0	0	0.0
09-MAY-95	1020.0	1020	0.0	0	0.0
16-MAY-95	791.0	791	0.0	0	0.0
23-MAY-95	500.0	500	0.0	0	0.0
30-MAY-95	354.0	354	0.0	0	0.0
31-MAY-95					
06-JUN-95	391.0	391	0.0	0	0.0
13-JUN-95	331.0	331	0.0	0	0.0
20-JUN-95	491.0	491	0.0	0	0.0
27-JUN-95	251.2	268	16.8	20	3.2
05-JUL-95	221.0	221	0.0	0	0.0
11-JUL-95	378.0	378	0.0	0	0.0
18-JUL-95	179.0	179	0.0	0	0.0
25-JUL-95	174.0	174	0.0	0	0.0
01-AUG-95	134.0	134	0.0	0	0.0
08-AUG-95	64.8	132	67.2	80	12.8
15-AUG-95	127.0	211	84.0	100	16.0
22-AUG-95	148.8	195	46.2	55	8.8
29-AUG-95	108.8	155	46.2	55	8.8
05-SEP-95	101.8	148	46.2	55	8.8
06-SEP-95					
12-SEP-95	127.8	174	46.2	55	8.8
19-SEP-95	113.6	164	50.4	60	9.6
26-SEP-95	77.6	128	50.4	60	9.6
02-OCT-95					
03-OCT-95	133.2	192	58.8	70	11.2
10-OCT-95	104.6	155	50.4	60	9.6
17-OCT-95	164.0	206	42.0	50	8.0
24-OCT-95	191.0	233	42.0	50	8.0
31-OCT-95	174.6	225	50.4	60	9.6
07-NOV-95					
14-NOV-95					
28-NOV-95					

NFWSLO = WSLO - STORAGE
 WHERE STORAGE = SRUS - LOSS
 WHERE LOSS = SRUS * .16

**Scoggins Dam
Reservoir Operations**

APPENDIX C

SCOGGINS DAM - RESERVOIR OPERATIONS For the Month of January 1995

INFLOW				HENRY HAGG LAKE						TUALATIN RIVER						WEATHER			WATER DELIVERIES									
DAY	SCHO		SCLO	TANO	TOTAL	INFL	W.S.	STOR	CHNG	CHNG	STOR	REL	COMP	GASO	DLLO	GOLF	ROOD	FRMO	WSLO	PREC	TEMP		TVID	USA	LO	HLS	FG	BVR
	CFS	CFS																			AF	STOR						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)				
1	59	153	12	224	48944	-527	-266	547	281	377	1340	1688	4865	5302	6100	0.00	44	33										
2	53	125	11	189	48417	-748	-377	631	254	299	1381	1620	4387	4877	5745	0.00	42	34										
3	46	109	10	165	47669	-802	-404	612	208	240	1270	1558	3925	4371	5353	0.00	43	34										
4	42	97	10	149	46867	-864	-436	591	155	204	1136	1479	3506	3965	4873	0.00	43	31										
5	38	86	9	133	46003	-864	-436	591	155	204	1136	1479	3506	3965	4873	0.00	43	31										
6	35	79	8	122	46003	-1029	-519	707	188	225	1162	1402	3105	3531	4376	0.00	41	29										
7	36	78	8	122	43707	-1267	-639	817	178	197	1249	1343	2717	3182	3857	0.06	44	32										
8	39	83	8	130	42418	-1289	-650	820	170	209	1270	1304	2371	2847	3494	0.26	51	46										
9	126	258	26	410	41228	-1190	-600	762	162	238	1312	1247	2159	2855	3138	0.46	46	40										
10	119	246	24	389	40632	-596	-300	630	330	635	1582	1397	2145	2589	3023	1.51	43	40										
11	90	233	21	344	41715	1083	546	64	610	753	1642	1750	2484	3359	4256	0.80	52	44										
12	95	219	20	334	42592	877	442	14	456	563	1350	1842	3405	3786	4609	0.18	51	43										
13	124	341	24	489	43343	751	379	15	394	445	1048	1782	3603	3959	4822	0.58	47	42										
14	212	506	30	748	44285	942	475	14	489	767	1249	1748	3938	4275	5500	0.84	51	43										
15	167	452	28	647	45729	1444	728	15	743	1076	1918	1861	4480	4755	5980	0.98	54	46										
16	121	337	26	484	47498	1769	892	15	907	1040	2601	2089	5034	5233	6326	0.53	50	44										
17	105	258	24	387	48955	1457	735	15	750	799	2094	2193	5494	5617	6572	0.37	47	34										
18	111	305	23	439	49960	1005	507	15	522	613	1479	2106	5690	5653	6865	0.04	41	36										
19	107	288	21	416	49938	-22	-11	675	664	650	2034	1951	4897	5936	6916	0.56	45	35										
20	81	230	18	329	50322	384	194	355	549	643	1932	1968	4737	5632	6124	0.24	47	34										
21	70	188	16	274	49839	-483	-244	729	485	484	2063	1947	4565	5660	6649	0.00	52	37										
22	59	160	15	234	48705	-1134	-572	992	420	399	2124	1928	4371	5458	6510	0.00	52	36										
23	54	138	13	205	47455	-1250	-630	1001	371	344	1975	1886	4167	5219	6099	0.00	53	36										
24	49	123	11	183	46193	-1262	-636	956	320	307	1876	1825	3868	4933	5833	0.00	49	36										
25	45	103	10	158	44744	-1449	-731	1015	284	282	1822	1751	3530	4594	5614	0.00	51	31										
26	41	94	10	145	43271	-1473	-743	988	245	257	1730	1693	3204	4235	5130	0.04	52	33										
27	37	88	9	134	41725	-1546	-779	1016	237	240	1692	1624	2854	3893	4747	0.06	48	35										
28	55	92	10	157	40813	-912	-460	617	157	228	1235	1546	2577	3545	4340	0.09	49	40										
29	92	193	18	303	291.50	-863	-435	577	142	225	1006	1403	2284	3236	3880	0.08	49	43										
30	138	386	34	558	290.39	-250	-126	563	437	454	1630	1532	2260	3201	3973	2.16	48	44										
31	212	668	44	924	291.33	942	475	14	489	676	1195	1775	2400	3323	4184	0.85	60	46										
					42326	1684	849	15	864	1241	1975	1967	2906	3834	5234	1.31	60	51										
TOT																												
CFS	2658	6716	551	9925																								
AF	5272	13321	1093	19686																								

Notes: For the first 4 months of water year 94/95, the Project has received 37.78' of precip or 142% of the average 26.62' normally received during the same 4 months.
For the water year 93/94, the Project received a total of 36.58' for the entire 12 month period.

***The computed inflow for Dec and Jan combined was 54,716 acre feet which would have filled the reservoir from 0 storage to a full pool!

SCOGGINS DAM - RESERVOIR OPERATIONS For the Month of February 1995

File: 295

INFLOW				HENRY HAGG LAKE				TUALATIN RIVER				WEATHER				WATER DELIVERIES									
DAY	SCHO SCLO		TANO	TOTAL	W.S. ELEV FT	STOR CONT AF	CHNG STOR AF	CHNG STOR CFS	REL CFS	COMP INFLO CFS	GASO CFS	DLLO CFS	GOLF CFS	ROOD CFS	FRMO CFS	WSLO CFS	PREC INCH	TEMP		TVID	USA	LO	HLS	FG	BVR
	CFS	CFS	CFS	CFS														F	F						
1	147	440	32	619	294.81	42326	1876	946	15	961	992	2623	2260	3560	4439	5586	0.17	59	46						
2	113	319	24	456	296.12	45571	1369	690	10	700	738	2109	2310	5891	5137	4590	0.40	56	41						
3	82	246	21	349	297.02	46526	955	481	10	491	542	1381	2259	5092	5803	6190	0.00	54	43						
4	78	499	19	596	297.36	46888	362	183	233	416	430	1242	1973	5009	5959	6464	0.00	59	45						
5	67	165	17	249	297.55	47091	203	102	232	334	365	990	1800	4694	5807	6759	0.00	58	45						
6	51	141	15	207	297.22	46739	-352	-177	412	235	320	1048	1662	4309	5493	6803	0.00	57	43						
7	48	123	14	185	296.45	45919	-820	-413	647	234	290	1242	1579	4529	5058	6220	0.00	60	41						
8	46	119	13	178	295.62	45042	-877	-442	617	175	266	1175	1537	4043	4570	5672	0.00	59	39						
9	42	103	12	157	294.62	44005	-1037	-523	693	170	249	1175	1483	3699	4105	5104	0.00	62	34						
10	37	86	11	134	293.49	42839	-1166	-588	761	173	229	1215	1432	3212	3680	4597	0.00	57	33						
11	32	79	10	121	292.30	41623	-1216	-613	765	152	220	1195	1389	2859	3297	4031	0.00	51	34						
12	35	78	10	123	291.17	40481	-1142	-576	690	114	212	1079	1343	2497	2973	3616	0.03	53	39						
13	31	71	10	112	290.15	39461	-1020	-514	627	113	203	1018	1294	2294	2792	3409	0.48	40	22						
14	29	68	10	107	290.32	39630	169	85	13	98	185	470	1094	2015	2554	3103	0.00	34	16						
15	32	75	10	117	290.52	39830	200	101	13	114	191	331	762	1530	1519	2742	0.47	34	19						
16	31	73	9	113	289.82	39142	-688	-347	527	180	229	725	1082	1575	2080	2688	0.30	40	32						
17	235	706	77	1018	289.71	39023	-119	-60	557	497	963	1156	1434	1954	2484	4019	2.04	50	38						
18	116	323	38	477	291.24	40552	1529	771	14	785	687	1904	2261	3091	3569	5143	0.16	56	45						
19	207	634	40	881	292.87	42204	1652	833	15	848	1273	1876	2462	3680	4053	5600	1.18	53	44						
20	131	419	32	582	294.55	43932	1728	871	15	886	893	2283	2653	4969	4886	5877	0.13	57	45						
21	126	288	28	442	295.84	45277	1345	678	15	693	603	1570	2614	5519	5469	6114	0.00	58	44						
22	78	213	25	316	296.41	45877	600	303	14	317	449	985	2444	5678	5821	6464	0.00	63	35						
23	69	183	22	274	296.90	46394	517	261	81	342	370	791	2145	5490	5796	6603	0.00	58	36						
24	58	153	18	229	297.25	46771	377	190	82	272	320	677	1886	5049	5551	6665	0.00	64	38						
25	51	119	16	186	297.42	46952	181	91	150	241	286	636	1675	4608	5109	6250	0.00	54	43						
26	47	105	15	167	297.56	47101	149	75	149	224	260	576	1484	4059	4590	5701	0.00	59	37						
27	43	95	14	152	297.62	47166	65	33	149	182	239	530	1287	3515	4029	5208	0.00	57	31						
28	41	86	14	141	297.77	47326	160	81	75	156	225	437	1085	2980	3510	4498	0.00	55	33						
29				NA						NA															
30				NA						NA															
31				NA						NA															
TOT																	5.36								
CFS	2103	6009	576	8688				2521	7581	10102	12229	32439	48689	107400	120133	145516		MAX	64	46	0	0	0	0	0
AF	4171	11919	1142	17233			5000	5000	15037	20037	24256	64343	96575	213028	238284	288631		MIN	34	16	0	0	0	0	0

Note: Scoggins Dam has received 43.14" of precip for the first five months of Water Year 94/95 or 134% of normal.

SCOGGINS DAM - RESERVOIR OPERATIONS For the Month of March 1995

DAY	INFLOW				HENRY HAGG LAKE						TUALATIN RIVER						WEATHER			WATER DELIVERIES					
	SCHO		SCLO	TANO TOTAL	W.S. ELEV FT	STOR CONT AF	CHNG STOR AF	CHNG STOR CFS	REL CFS	COMP INFO CFS	GASO CFS	DLLO CFS	GOLF CFS	ROOD CFS	FRMO CFS	WSLO CFS	PREC INCH	TEMP		TVID CFS	USA CFS	LO CFS	HLS CFS	FG CFS	BVR CFS
	CFS	CFS	CFS	CFS														F	F						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)					(20)	(21)	(22)	(23)	(24)	(25)
1	41	79	13	133	297.91	47326	149	75	75	150	212	390	895	2430	2948	3789	0.00	53	32						
2	38	73	13	124	298.04	47616	141	71	74	145	201	354	768	1797	2396	3161	0.00	51	35						
3	36	68	12	116	298.18	47776	160	81	36	117	189	276	656	1348	1868	2414	0.00	55	31						
4	39	76	13	128	298.48	48089	313	158	13	171	201	257	596	1133	1530	1848	0.47	47	33						
5	35	68	12	115	298.69	48316	227	114	13	127	193	275	648	1310	1551	1660	0.24	44	33						
6	28	64	11	103	298.85	48489	173	87	13	100	170	243	579	1109	1480	1669	0.00	49	29						
7	27	59	11	97	299.05	48705	216	109	13	122	155	227	532	976	1283	1470	0.00	50	29						
8	27	62	11	100	299.20	48868	163	82	13	95	150	220	488	904	1175	1373	0.30	55	32						
9	102	216	24	342	299.47	49162	294	148	161	309	461	551	942	1299	1423	1739	1.61	55	46						
10	95	243	21	359	299.94	49675	513	259	180	439	581	818	1721	2275	2673	2876	0.62	58	44						
11	76	193	18	287	300.31	50080	405	204	181	385	432	942	1725	2538	2968	3457	0.24	49	43						
12	65	167	15	247	300.39	50168	88	44	178	222	364	844	1784	2653	3073	3604	0.12	54	32						
13	96	239	24	359	300.92	50752	584	294	183	477	445	784	1731	2714	3124	3766	0.75	57	42						
14	124	294	29	447	301.43	51317	565	285	211	496	572	1169	1916	2991	3375	4090	0.87	59	48						
15	89	339	24	452	301.90	51840	523	264	212	476	514	1298	2124	3248	3436	4280	0.02	57	40						
16	73	188	20	281	302.16	52130	290	146	210	356	400	956	2112	3348	3695	4328	0.02	59	32						
17	61	158	17	236	301.83	51762	-368	-186	469	283	238	1079	1988	3405	3746	4352	0.00	62	35						
18	56	143	16	215	301.18	51040	-722	-364	611	247	308	1263	1908	3369	3775	4376	0.13	64	49						
19	57	148	17	222	300.56	50355	-685	-345	596	251	339	1242	1885	3313	3662	4304	0.06	55	42						
20	85	211	27	323	300.25	50014	-341	-172	491	319	549	1340	1904	3256	3668	4547	1.25	51	40						
21	81	222	22	325	300.46	50245	231	116	295	411	545	1235	2023	3363	3759	4597	0.83	52	36						
22	77	208	21	306	300.62	50421	176	89	294	383	456	1195	2096	3393	3795	4535	0.18	45	35						
23	70	183	19	272	300.68	50487	66	33	293	326	376	924	2058	3381	3774	4486	0.03	50	31						
24	59	170	17	246	300.65	50454	-33	-17	292	275	331	812	1921	3271	3701	4449	0.10	50	34						
25	55	143	16	214	300.84	50664	210	106	133	239	295	626	1741	3167	3560	4172	0.04	51	33						
26	50	132	15	197	300.99	50829	165	83	132	215	270	551	1496	2977	3354	3949	0.00	49	29						
27	44	123	14	181	301.10	50951	122	62	132	194	250	501	1249	2619	3087	3743	0.00	60	31						
28	41	115	13	169	301.22	51084	133	67	111	178	235	432	1065	2225	2757	3314	0.00	65	36						
29	38	88	12	138	301.32	51195	111	56	104	160	224	395	908	1756	2341	2832	0.00	69	36						
30	35	81	11	127	301.43	51317	122	62	78	140	212	361	783	1408	1941	2322	0.00	70	37						
31	32	73	11	116	301.55	51450	133	67	53	120	203	289	685	1217	1652	1894	0.00	72	42						
TOT																	7.88								
CFS	1832	4626	519	6977				2079	5850	7929	10071	21849	42927	74193	86570	103396	MAX	72	49	0	0	0	0	0	0
AF	3634	9176	1029	13839			4124	4124	11603	15728	19976	43337	85146	147162	171712	205086	MIN	44	29	0	0	0	0	0	0

Note: Total inflow into the reservoir to date for the water year 1995 beginning Oct. 1, 1994 has been 84,621 acre feet.
For comparison, the total inflow into the reservoir for the same time period of water year 1994 was 54,747 acre feet.

SCOGGINS DAM - RESERVOIR OPERATIONS For the Month of April 1995

DAY	INFLOW				HENRY HAGG LAKE				TUALATIN RIVER								WEATHER				WATER DELIVERIES					
	SCHO		TANO		W.S. ELEV FT	STOR CONT AF	CHNG STOR AF	CHNG STOR CFS	REL CFS	COMP INFO CFS	GASO CFS	DLLO CFS	GOLF CFS	ROOD CFS	FRMO CFS	WSLO CFS	PREC INCH	TEMP		TVID	USA	LO	HLS	FG	BVR	
	CFS	(1)	CFS	(2)														F	F							(20)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)							
1	29	67	10	106	301.73	51450	200	101	35	136	191	264	624	1084	1443	1584	0.00	57	34							
2	28	64	9	101	301.84	51773	123	62	36	98	173	247	585	995	1272	1414	0.00	58	33							
3	27	61	9	97	302.01	51963	190	96	35	131	164	216	540	904	1179	1305	0.00	62	37							
4	26	58	8	92	302.12	52085	122	62	38	100	154	206	515	843	1083	1201	0.00	70	37							
5	25	56	8	89	302.23	52208	123	62	39	101	147	198	500	813	1034	1150	0.01	53	37							
6	23	52	7	82	302.25	52231	23	12	99	111	136	239	522	785	988	1087	0.03	56	40							
7	46	99	12	157	302.35	52343	112	56	99	155	248	289	563	830	1028	1162	0.88	60	44							
8	49	113	13	175	302.39	52387	44	22	185	207	300	483	883	1205	1494	1407	0.67	47	34							
9	45	119	12	176	302.42	52421	34	17	185	202	284	521	1045	1369	1817	1839	0.22	46	32							
10	36	101	12	149	302.41	52410	-11	-6	185	179	250	489	1035	1418	1899	2084	0.17	48	36							
11	35	90	11	136	302.33	52320	-90	-45	185	140	245	476	982	1365	1835	2065	0.12	51	37							
12	32	94	12	138	302.45	52455	135	68	99	167	228	393	854	1309	1759	1979	0.18	59	41							
13	36	97	12	145	302.32	52309	-146	-74	250	176	243	517	1002	1400	1848	2282	0.53	53	38							
14	34	94	12	140	302.33	52320	11	6	152	158	233	453	974	1411	1943	2242	0.07	53	38							
15	31	86	11	128	302.47	52477	157	79	67	146	225	382	845	1360	1836	2133	0.00	52	36							
16	29	79	10	118	302.58	52601	124	63	67	130	209	345	751	1250	1693	1941	0.00	61	32							
17	27	73	9	109	302.71	52747	146	74	67	141	195	299	688	1154	1526	1766	0.04	65	32							
18	27	68	9	104	302.81	52859	112	56	62	118	191	286	649	1102	1447	1628	0.16	51	35							
19	25	65	9	99	302.89	52949	90	45	62	107	170	267	597	1032	1354	1561	0.13	53	32							
20	31	78	10	119	303.02	53095	146	74	63	137	212	304	666	1027	1327	1597	0.56	51	35							
21	27	67	9	103	303.08	53168	73	37	62	99	200	290	653	1151	1490	1641	0.03	55	39							
22	25	64	9	98	303.18	53276	108	54	63	117	181	286	600	1083	1443	1597	0.00	57	34							
23	23	58	9	90	303.25	53355	79	40	63	103	164	269	565	984	1289	1477	0.00	72	37							
24	21	55	9	85	303.21	53210	-145	-73	63	-10	155	238	529	900	1179	1388	0.00	76	38							
25	20	52	8	80	303.27	53378	168	85	63	148	142	226	488	845	1094	1282	0.00	75	39							
26	19	50	8	77	303.30	53411	33	17	64	81	131	213	471	782	999	1192	0.00	72	43							
27	19	46	8	73	303.32	53434	23	12	64	76	127	205	452	749	944	1092	0.00	61	45							
28	19	48	8	75	303.40	53525	91	46	39	85	131	193	453	742	930	1104	0.34	55	47							
29	18	46	8	72	303.44	53570	45	23	64	87	124	218	461	775	975	1062	0.28	56	44							
30	19	44	9	72	303.47	53604	34	17	64	81	125	220	460	769	975	1117	0.11	58	44							
31				NA						NA																
TOT																	4.53									
CFS	851	2144	290	3285				1086	2619	3705	5678	9232	19952	31436	41123	46379	MAX	76	47	0	0	0	0	0	0	
AF	1688	4253	575	6516			2154	2154	5195	7349	11262	18312	39575	62353	81567	91993	MIN	46	32	0	0	0	0	0	0	

*Note: On April 24, The Fluidigage (WS elev.) was recalibrated to match the surveyed reading in the Forebay stilling well and the corresponding staff gage reading located on the spillway splitter wall.

W.O.

SCOGGINS DAM - RESERVOIR OPERATIONS For the Month of May 1995

File: 595

DAY	INFLOW				HENRY HAGG LAKE						TUALATIN RIVER						-- WEATHER --			-- WATER DELIVERIES --						
	SCHO		TANO		TOTAL INFLW	W.S. ELEV FT	STOR CONT	CHNG STOR AF	CHNG STOR CFS	REL CFS	COMP INFLW CFS	GASO CFS	DILLO CFS	GOLF CFS	ROOD CFS	FRMO CFS	WSLO CFS	PREC INCH	TEMP		TVID	USA	LO	HLS	FG	BVR
	CFS	CFS	CFS	CFS															F	F						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)		
1	18	44	9	71	303.50	53604	36	18	64	82	118	193	425	723	920	1092	0.16	68	46	0	0	0	0	0	0	
2	19	47	9	75	303.53	53672	32	16	89	105	131	229	486	804	977	1166	0.18	57	49							
3	17	42	8	67	303.50	53640	-32	-16	89	73	127	223	453	825	1047	1223	0.00	62	42							
4	17	38	8	63	303.51	53649	9	5	66	71	122	195	417	738	937	1129	0.00	62	42							
5	19	44	8	71	303.55	53694	45	23	66	89	129	202	428	727	894	1129	0.33	59	46							
6	17	41	8	66	303.53	53672	-22	-11	77	66	121	220	433	825	1024	1092	0.00	56	47							
7	16	40	8	64	303.50	53640	-32	-16	77	61	112	211	414	782	980	1104	0.00	61	43							
8	15	38	7	60	303.47	53604	-36	-18	77	59	106	192	390	733	913	1092	0.00	59	48							
9	14	35	7	56	303.48	53615	11	6	50	56	99	158	348	686	856	1020	0.04	67	49							
10	16	35	7	58	303.50	53640	25	13	47	60	102	157	340	630	783	950	0.10	57	47							
11	21	47	9	77	303.56	53706	66	33	57	90	136	185	364	638	773	950	0.55	57	44							
12	15	40	9	64	303.52	53660	-46	-23	98	75	114	213	444	788	954	1008	0.11	58	39							
13	15	36	8	59	303.50	53640	-20	-10	70	60	106	190	386	712	904	1038	0.00	60	48							
14	14	34	7	55	303.49	53626	-14	-7	70	63	96	181	347	629	802	945	0.00	75	43							
15	12	32	7	51	303.48	53615	-11	-6	70	64	87	171	324	572	714	877	0.00	84	46							
16	12	31	7	50	303.51	53649	34	17	42	59	80	140	270	512	652	791	0.00	77	53							
17	12	30	7	49	303.54	53683	34	17	43	60	77	128	263	455	576	739	0.00	64	43							
18	12	29	7	48	303.57	53717	34	17	25	42	74	103	230	441	552	683	0.00	58	46							
19	11	27	6	44	303.50	53640	-77	-39	82	43	72	169	294	398	500	644	0.00	65	40							
20	10	27	6	43	303.49	53626	-14	-7	41	34	66	109	214	419	519	596	0.00	77	44							
21	10	25	6	41	303.49	53626	0	0	31	31	62	101	196	355	451	581	0.00	79	45							
22	9	24	6	39	303.54	53683	57	29	31	60	59	97	182	333	417	547	0.00	80	46							
23	8	22	6	36	303.55	53694	11	6	39	45	57	97	178	311	391	500	0.00	83	45							
24	8	22	6	36	303.53	53672	-22	-11	41	30	54	97	162	294	368	482	0.00	78	42							
25	8	21	6	35	303.53	53672	0	0	35	35	52	89	143	272	339	431	0.00	81	44							
26	7	21	6	34	303.55	53694	22	11	22	33	49	79	118	245	300	423	0.00	83	42							
27	7	20	6	33	303.55	53694	0	0	38	38	48	97	123	203	276	368	0.00	84	46							
28	7	20	6	33	303.55	53694	0	0	38	38	48	96	135	214	276	302	0.00	84	48							
29	7	18	5	30	303.54	53683	-11	-6	38	32	45	92	132	222	285	298	0.00	89	49							
30	6	18	5	29	303.52	53660	-23	-12	38	26	42	78	116	203	271	354	0.00	90	47							
31	6	17	5	28	303.50	53640	-20	-10	42	32	41	78	114	177	247	331	0.00	78	46	4						
TOT																	1.47									
CFS	385	965	215	1565				18	1693	1711	2633	4570	8869	15866	19898	23885		MAX	90	53	4	0	0	0	0	0
AF	764	1914	426	3104			36	36	3358	3394	5223	9065	17592	31470	39468	47376		MIN	56	39	8	0	0	0	0	0

SCOGGINS DAM - RESERVOIR OPERATIONS For the Month of June 1995

DAY	INFLOW				HENRY HAGG LAKE						TUALATIN RIVER						-- WEATHER --		WATER DELIVERIES							
	SCHO SCLO TANO TOTAL INFLW				W.S. ELEV FT	STOR CONT AF	CHNG STOR AF	CHNG STOR CFS	REL CFS	COMP INFLW	GASO CFS	DLLO CFS	GOLF CFS	ROAD CFS	FRMO CFS	WSLO CFS	PREC INCH	TEMP MAX MIN F F	TVID	USA CFS	LO CFS	HLS CFS	FG CFS	BVR CFS		
	CFS	CFS	CFS	CFS																					(10)	(11)
1	6	17	5	28	303.47	53640	-36	-18	42	24	38	75	85	165	233	284	0.00	78	42	14	0	0	0	0	0	
2	6	16	5	27	303.44	53570	-34	-17	42	25	38	60	80	146	216	281	0.00	83	49	15	0	0	0	0	0	
3	6	16	5	27	303.37	53491	-79	-40	66	26	45	118	122	136	199	243	0.00	73	43	23	0	0	4	1	18	
4	6	16	5	27	303.29	53400	-91	-46	72	26	45	115	116	167	231	233	0.00	77	46	22	0	0	4	1	18	
5	7	18	6	31	303.22	53321	-79	-40	72	32	50	115	147	207	257	309	0.25	65	44	16	0	0	4	1	18	
6	6	18	5	29	303.14	53231	-90	-45	72	27	52	123	176	295	343	391	0.05	61	41	17	0	0	4	1	18	
7	6	17	5	28	303.08	53163	-68	-34	57	23	52	101	141	384	347	439	0.00	58	47	0	0	0	2	0	16	
8	5	16	5	26	303.05	53129	-34	-17	44	27	49	91	122	339	291	391	0.00	72	48	0	0	0	2	0	16	
9	7	12	1	20	303.01	53084	-45	-23	43	20	45	85	74	292	256	354	0.00	79	50	0	0	0	2	0	16	
10	7	11	1	19	302.93	52994	-90	-45	67	22	45	115	88	268	233	310	0.00	79	52	30	0	0	2	0	16	
11	7	13	2	22	302.86	52915	-79	-40	73	33	50	124	111	285	244	280	0.10	63	42	33	0	0	2	0	16	
12	7	12	2	21	302.76	52803	-112	-56	73	17	46	117	118	324	276	300	0.00	68	46	34	0	0	2	0	16	
13	8	12	2	22	302.68	52713	-90	-45	72	27	48	117	103	198	269	331	0.17	63	50	32	0	0	2	0	16	
14	10	15	2	27	302.67	52702	-11	-6	52	46	55	107	108	218	277	334	0.15	58	51	7	0	0	2	0	16	
15	16	23	2	41	302.75	52791	89	45	40	85	61	100	108	301	356	486	0.65	60	52	0	0	0	0	0	13	
16	10	15	2	27	302.79	52836	45	23	15	38	63	93	137	365	458	528	0.19	64	50	0	0	0	0	0	13	
17	8	13	2	23	302.83	52881	45	23	15	38	53	86	103	284	374	532	0.00	69	51	0	0	0	0	0	13	
18	8	14	2	24	302.84	52893	12	6	15	21	53	86	92	262	335	477	0.11	62	47	0	0	0	0	0	13	
19	12	19	2	33	302.89	52949	56	28	15	43	75	106	111	244	309	426	0.62	59	48	0	0	0	0	0	13	
20	11	12	2	25	302.97	53039	90	45	15	60	62	97	129	287	354	477	0.15	64	51	0	0	0	0	0	13	
21	9	14	2	25	303.03	53095	56	28	15	43	55	78	90	260	336	433	0.00	63	53	0	0	0	0	0	13	
22	8	13	2	23	303.04	53118	23	12	15	27	51	72	82	213	283	402	0.00	68	48	0	0	0	0	0	13	
23	7	12	2	21	303.06	53141	23	12	15	27	48	76	66	191	258	348	0.00	76	53	0	0	0	0	0	13	
24	7	11	1	19	302.98	53050	-91	-46	69	23	44	125	89	154	221	293	0.00	85	53	24	13	0	0	0	13	
25	6	10	1	17	302.85	52904	-146	-74	92	18	42	131	96	177	236	253	0.00	83	48	32	20	0	6	1	16	
26	6	9	1	16	302.70	52735	-169	-85	93	8	39	133	94	171	235	253	0.00	82	51	34	20	0	6	1	16	
27	5	9	1	15	302.48	52488	-247	-125	138	13	39	162	115	160	226	268	0.00	85	58	80	20	0	6	1	16	
28	5	9	1	15	302.26	52242	-246	-124	130	6	37	160	90	168	236	244	0.00	90	56	84	10	0	3	0	18	
29	4	8	1	13	302.02	51974	-268	-135	143	8	34	160	94	143	207	213	0.00	90	65	99	10	0	3	0	18	
30	4	7	1	12	301.76	51684	-290	-146	150	4	34	171	88	117	200	211	0.00	93	64	104	10	3	3	0	18	
31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
TOT																	2.44									
CFS	220	407	76	703			-986	1822	836		1448	3299	3175	6921	8296	10326	MAX	93	65	700	103	3	59	7	432	
AF	436	807	151	1394			-1956	-1956	3614	1658	2872	6544	6298	13728	16455	20482	MIN	58	41	1388	204	6	117	14	857	

*Note shift changes implemented on 6/9 at SCLO, SCLO, TANO & GOLF

*Note shift change at Road Br. (-30) from Asst. Watermaster on 6/30.

SCOGGINS DAM - RESERVOIR OPERATIONS For the Month of July 1995

File: 795

DAY	----- INFLOW -----				----- HENRY HAGG LAKE -----							----- TUALATIN RIVER -----							----- WEATHER -----			----- WATER DELIVERIES -----						
	SCHO SCLO		TANO TOTAL		W.S. ELEV FT	STOR CONT AF	CHNG STOR AF	CHNG STOR CFS	REL CFS	COMP INFO CFS	GASO CFS	DLLO CFS	GOLF CFS	ROOD CFS	FRMO CFS	WSLO CFS	PREC INCH	TEMP MAX F	TVID	CFS	USA CFS	LO CFS	HLS CFS	FG CFS	BVR CFS			
	CFS	(1)	CFS	(2)																						(3)	(4)	(5)
1	4	7	1	12	301.52	51684	-267	-135	145	10	30	166	77	112	191	214	0.00	99	52	104	5	3	3	0	18			
2	4	7	1	12	301.29	51162	-255	-129	144	15	31	166	87	101	182	200	0.00	90	55	103	5	3	3	0	18			
3	4	7	1	12	301.06	50907	-255	-129	145	16	32	159	124	134	207	198	0.00	71	57	108	5	3	3	0	18			
4	4	7	1	12	300.85	50675	-232	-117	116	-1	35	149	79	142	286	213	0.00	72	54	80	0	3	3	0	18			
5	4	7	1	12	300.65	50454	-221	-111	116	5	32	143	79	112	199	221	0.00	80	55	80	0	3	3	0	18			
6	4	7	1	12	300.46	50245	-209	-105	116	11	32	141	70	105	191	203	0.00	77	55	80	0	3	3	0	18			
7	4	8	1	13	300.28	50047	-198	-100	116	16	33	143	80	93	179	198	0.02	67	55	77	0	3	2	2	19			
8	5	7	1	13	300.11	49861	-186	-94	109	15	32	138	76	106	187	172	0.00	77	57	70	0	3	2	2	19			
9	5	9	1	15	299.95	49686	-175	-88	109	21	35	138	59	101	187	172	0.38	86	62	68	0	3	2	2	19			
10	6	9	1	16	299.80	49522	-164	-83	109	26	35	143	133	301	399	310	0.18	69	48	60	0	3	2	2	19			
11	5	8	1	14	299.64	49347	-175	-88	100	12	33	133	97	235	354	378	0.00	73	51	60	0	3	2	2	19			
12	5	7	1	13	299.44	49129	-218	-110	100	-10	30	129	81	162	266	348	0.00	78	49	61	0	3	2	2	19			
13	4	6	1	11	299.27	48944	-185	-93	114	21	24	137	77	129	220	277	0.00	78	48	77	0	3	2	2	19			
14	4	6	1	11	299.08	48738	-206	-104	114	10	24	130	65	112	202	235	0.00	73	54	77	0	3	6	2	16			
15	4	6	1	11	298.87	48510	-228	-115	129	14	23	150	94	95	178	205	0.00	77	49	81	10	3	6	2	16			
16	3	6	1	10	298.63	48251	-259	-131	135	4	21	148	75	105	192	187	0.00	83	63	88	10	3	6	2	16			
17	3	5	1	9	298.39	47992	-259	-131	135	4	21	137	75	101	186	196	0.00	93	65	89	10	3	6	2	16			
18	3	5	1	9	298.08	47659	-333	-168	165	-3	19	174	66	85	173	179	0.00	99	64	120	0	3	10	3	20			
19	2	4	1	7	297.78	47337	-322	-162	173	11	18	173	71	84	161	163	0.00	94	63	124	0	3	13	3	23			
20	2	4	1	7	297.47	47005	-332	-167	173	6	18	173	72	83	158	148	0.00	93	58	124	0	3	13	3	23			
21	2	4	1	7	297.17	46675	-330	-166	173	7	18	170	74	78	157	145	0.00	89	56	124	0	3	13	3	23			
22	2	4	1	7	296.84	46331	-344	-173	172	-1	19	169	86	68	152	148	0.00	80	60	123	0	3	13	3	23			
23	2	5	1	8	296.53	46003	-328	-165	172	7	20	174	94	94	174	145	0.00	73	60	122	0	3	13	2	23			
24	2	5	0	7	296.23	45687	-316	-159	172	13	20	177	116	116	192	159	0.00	74	59	123	0	3	13	3	23			
25	2	5	0	7	295.96	45403	-284	-143	143	-0	20	150	68	111	197	174	0.00	79	53	94	0	3	13	3	23			
26	2	4	0	6	295.71	45141	-262	-132	143	11	18	147	71	71	158	155	0.00	86	58	94	10	3	9	2	19			
27	2	4	0	6	295.46	44880	-261	-132	127	-5	21	137	66	70	153	143	0.00	74	54	88	0	3	9	2	19			
28	2	5	0	7	295.20	44608	-272	-137	146	9	20	153	63	66	146	137	0.00	83	56	106	0	3	9	2	19			
29	2	4	0	6	294.90	44296	-312	-157	155	-2	14	157	87	65	140	96	0.00	80	47	104	0	3	16	3	23			
30	2	4	0	6	294.60	43984	-312	-157	155	-2	14	155	87	87	171	100	0.00	70	42	104	0	3	16	3	23			
31	2	4	0	6	294.33	43704	-280	-141	155	14	12	158	92	89	171	108	0.00	81	43	104	0	3	16	3	23			
TOT																	0.58											
CFS	101	180	23	304			-4023	4276	253		754	4717	2541	3413	6109	5928	MAX	99	65	2917	55	93	232	60	612			
AF	200	357	46	603			-7980	-7980	8481	501	1496	9356	5040	6770	12117	11758	MIN	67	42	5786	109	184	460	119	1214			

SCOGGINS DAM - RESERVOIR OPERATIONS For the Month of August 1995

File: 895

----- INFLOW -----				HENRY HAGG LAKE								TUALATIN RIVER								-- WEATHER --				----- WATER DELIVERIES -----							
DAY	SCHO	CFS	TANO	INFO	W.S. ELEV FT	STOR CONT AF	CHNG STOR AF	CHNG STOR CFS	REL CFS	COMP INFO CFS	GASO CFS	DILLO CFS	GOLF CFS	ROOD CFS	FRMO CFS	WSLO CFS	PREC INCH	TEMP MAX F	MIN F	TVID	USA CFS	LO CFS	HLS CFS	FG CFS	BVR CFS						
(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)						
1	2	4	0	6	294.01	43704	-330	-166	155	-11	10	153	58	77	163	134	0.00	88	57	104	0	3	16	3	23						
2	2	4	0	6	293.70	43054	-320	-161	174	13	10	168	82	64	131	159	0.00	88	53	123	0	3	16	3	23						
3	2	4	0	6	293.36	42705	-349	-176	161	-15	11	159	65	65	132	128	0.00	82	54	110	0	3	16	3	23						
4	2	4	0	6	293.03	42367	-338	-170	170	-0	11	166	73	65	123	118	0.00	87	56	119	0	3	16	3	23						
5	2	3	0	5	292.69	42020	-347	-175	181	6	10	176	77	62	127	108	0.00	77	53	118	10	3	20	3	22						
6	2	3	0	5	292.35	41674	-346	-174	181	7	10	178	107	74	136	105	0.00	79	50	118	10	3	20	3	22						
7	2	5	1	8	292.00	41319	-355	-179	181	2	12	181	93	95	165	118	0.02	69	50	115	10	3	20	3	22						
8	3	4	0	7	291.57	40884	-435	-219	247	28	13	238	155	90	163	132	0.01	70	53	116	80	3	19	4	17						
9	2	4	0	6	291.13	40441	-443	-223	229	6	11	213	122	139	207	137	0.00	75	50	104	80	3	15	3	18						
10	2	4	0	6	290.70	40010	-431	-217	228	11	11	214	114	103	182	150	0.00	85	52	103	80	3	15	3	18						
11	3	7	1	11	290.34	39650	-360	-182	228	46	18	221	178	160	214	164	0.61	70	53	98	80	3	15	3	18						
12	3	6	1	10	289.87	39182	-468	-236	228	-8	13	219	166	184	257	190	0.00	73	48	90	89	3	15	3	18						
13	2	4	0	6	289.43	38746	-436	-220	227	7	12	220	165	173	246	211	0.00	71	43	92	89	3	15	3	18						
14	2	4	0	6	289.01	38331	-415	-209	227	18	12	222	182	167	239	224	0.00	77	45	92	89	3	15	3	18						
15	2	3	0	5	288.59	37918	-413	-208	210	2	11	202	138	152	231	211	0.00	82	57	66	100	3	15	3	18						
16	2	3	0	5	288.17	37507	-411	-207	210	3	11	199	130	130	207	221	0.00	71	53	86	80	3	15	3	18						
17	2	4	0	6	287.77	37117	-390	-197	210	13	12	202	134	125	202	233	0.10	65	48	85	80	3	15	3	18						
18	2	4	0	6	287.39	36747	-370	-187	197	10	14	192	129	200	247	227	0.21	67	45	89	70	3	15	3	11						
19	2	4	0	6	287.00	36370	-377	-190	190	-0	14	188	133	138	232	247	0.00	77	46	82	70	3	15	3	11						
20	1	3	0	4	286.63	36013	-357	-180	189	9	14	189	119	129	217	221	0.00	85	46	83	70	3	15	3	11						
21	1	3	0	4	286.24	35638	-375	-189	189	-0	13	188	135	128	208	205	0.00	93	49	83	70	3	15	3	11						
22	1	3	0	4	285.91	35321	-317	-160	162	2	14	166	74	132	192	195	0.00	80	52	71	55	3	15	3	11						
23	1	3	0	4	285.54	34968	-353	-178	197	19	14	193	101	73	146	179	0.00	81	54	106	55	3	15	3	11						
24	1	2	0	3	285.14	34588	-380	-192	176	-16	13	175	100	96	162	150	0.00	72	43	70	70	3	15	3	11						
25	1	2	0	3	284.78	34245	-343	-173	175	2	14	175	100	96	140	150	0.00	74	43	79	55	3	18	4	13						
26	1	2	0	3	284.42	33903	-342	-172	175	3	11	174	92	87	162	130	0.00	81	42	78	55	3	18	4	13						
27	1	2	0	3	284.07	33573	-330	-166	175	9	13	174	117	97	162	130	0.00	73	42	78	55	3	18	4	13						
28	1	2	0	3	283.68	33205	-368	-186	175	-11	13	174	128	108	177	137	0.00	80	50	78	55	3	18	4	13						
29	1	2	0	3	283.34	32914	-291	-147	175	28	13	171	109	106	182	155	0.06	75	48	78	55	3	18	4	13						
30	2	3	0	5	283.01	32578	-336	-169	160	-9	15	162	98	131	186	162	0.00	70	52	62	55	3	18	4	13						
31	1	3	0	4	282.68	32270	-308	-155	160	5	15	163	98	92	171	170	0.00	80	51	63	55	3	18	4	13						
TOT																	1.01														
CFS	54	108	3	165				-5765	5942	177	388	5815	3572	3538	5709	5201		93	57	2839	1722	93	509	101	505						
AF	107	214	6	327			-11434	11434	11786	352	770	11534	7085	7018	11324	10316		MAX	MIN	5631	3416	184	1010	200	1002						

USED
12817
3719
374
1587
333
3073

REMAINING
8819
126
3413
4167
927

TVID
USA
LO
HLS
FG
BVTN

SCOGGINS DAM - RESERVOIR OPERATIONS For the Month of September 1995

File: 995

INFLOW				HENRY HAGG LAKE						TUALATIN RIVER						WEATHER			WATER DELIVERIES							
DAY	SCHO CFS	SCLO CFS	TANO CFS	TOTAL INFO CFS	W.S. ELEV FT	STOR CONT AF	CHNG STOR AF	CHNG STOR CFS	REL CFS	COMP INFO CFS	GASO CFS	DLLO CFS	GOLF CFS	ROOD CFS	FRMO CFS	WSLO CFS	PREC INCH	TEMP MAX F	TEMP MIN F	TVID CFS	USA CFS	LO CFS	HLS CFS	FG CFS	BVR CFS	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)		
1	1	2	0	3	322/0																					
2	1	2	0	3	282.33	31945	-325	-164	151	-13	14	152	77	84	160	155	0.00	87	54	57	55	3	18	4	13	
3	1	3	0	4	282.03	31658	-287	-145	157	12	12	160	80	68	137	145	0.00	94	53	63	55	3	17	4	12	
4	1	3	0	4	281.71	31371	-287	-145	157	12	12	158	102	74	139	134	0.00	80	53	62	55	3	17	4	12	
5	2	3	0	5	281.37	31059	-312	-157	157	-0	14	162	119	100	167	134	0.14	67	53	62	55	3	17	4	12	
6	2	3	0	5	281.05	30766	-293	-148	157	9	15	163	124	116	189	148	0.06	70	54	61	55	3	17	4	12	
7	2	3	0	5	280.76	30501	-265	-134	137	3	16	147	99	122	200	164	0.20	69	52	41	55	3	17	4	12	
8	2	4	0	6	280.48	30246	-255	-129	137	8	18	147	124	132	202	174	0.15	65	54	40	55	3	17	4	12	
9	2	4	0	6	280.11	30000	-246	-124	137	13	17	148	119	140	217	221	0.00	70	50	40	55	3	17	4	12	
10	3	0	0	3	279.95	29765	-235	-118	124	6	15	134	98	127	202	213	0.00	82	52	30	55	3	14	5	12	
11	1	3	0	4	279.65	29530	-235	-118	124	6	13	132	96	110	181	203	0.00	86	52	31	55	3	14	5	12	
12	1	3	0	4	279.43	29296	-234	-118	124	6	13	131	87	120	174	187	0.00	88	53	31	55	3	14	5	12	
13	1	2	0	3	279.16	29053	-243	-123	124	1	12	129	78	81	157	174	0.00	81	51	32	55	3	14	5	12	
14	1	2	0	3	278.82	28740	-313	-158	166	8	12	167	97	72	142	157	0.00	86	54	59	70	3	14	5	12	
15	1	2	0	3	278.48	28401	-339	-171	174	3	12	176	118	91	158	145	0.00	90	54	67	70	3	14	5	12	
16	1	2	0	3	278.06	28072	-329	-166	174	8	11	174	113	103	171	150	0.00	92	54	52	85	3	14	5	12	
17	1	2	0	3	277.75	27798	-274	-138	148	10	11	149	98	104	173	159	0.00	82	53	42	70	3	14	5	12	
18	1	3	0	4	277.43	27515	-283	-143	149	6	12	149	103	96	166	162	0.00	67	57	41	70	3	14	5	12	
19	1	3	0	4	277.09	27216	-299	-151	149	-2	13	153	113	108	172	159	0.00	69	47	41	70	3	14	5	12	
20	1	3	0	4	276.81	26971	-245	-124	130	6	13	138	89	103	179	164	0.00	77	53	32	60	3	14	5	12	
21	1	3	0	4	276.55	26744	-227	-114	121	7	12	127	80	85	160	167	0.00	82	52	33	50	3	14	5	12	
22	1	2	0	3	276.26	26491	-253	-128	124	-4	11	131	76	69	153	155	0.00	89	58	37	50	3	14	5	12	
23	1	2	0	3	275.97	26239	-252	-127	129	2	10	136	90	65	144	141	0.00	78	55	42	50	3	14	5	12	
24	1	2	0	3	275.67	25980	-259	-131	129	-2	9	136	71	67	151	132	0.00	84	47	40	55	0	14	5	12	
25	1	2	0	3	275.43	25773	-207	-104	110	6	10	122	59	64	136	134	0.00	79	48	21	55	0	14	5	12	
26	1	3	0	4	275.15	25532	-241	-122	131	9	10	140	85	64	127	122	0.12	76	53	42	55	0	14	5	12	
27	10	15	2	27	274.88	25309	-223	-112	127	15	15	142	95	85	155	128	0.15	72	53	32	60	0	14	5	12	
28	3	9	1	13	274.74	25180	-129	-65	104	39	28	131	88	155	189	164	0.59	61	53	10	36	0	14	5	12	
29	2	6	0	8	274.63	25088	-92	-46	68	22	39	112	107	175	246	233	0.24	65	54	12	12	0	14	5	12	
30	3	6	0	9	274.61	25069	-19	-10	21	11	20	52	49	159	246	290	0.06	65	53	16	0	0	0	0	0	
31				NA	274.60	25061	-8	-4	21	17	25	53	33	103	192	262	0.18	63	53	2	10	0	0	0	0	
TOT	49	104	3	156			-3635	3861	226		444	4151	2767	3042	5185	5076	1.89	MAX	94	58	1171	1588	66	417	132	337
CFS	97	206	6	309			-7209	7658	449		881	8234	5488	6034	10284	10068		MIN	61	47	2323	3150	131	827	262	668
AF																										

1995 RESERVOIR STORAGE STATUS (AF):

USED		REMAINING	
TVID	15136	USA	12572
LO	6879	LO	5759
HLSBO	505	FG	0
FG	2414	BVTN	2586
BVTN	595		3905
	3741		259

DATE: 9/30/95
 HOUR: 08:00

Precip for w/y 95: 62.94"

SCOGGINS DAM - RESERVOIR OPERATIONS For the Month of October 1995

File: 1095

----- INFLOW -----				----- HENRY HAGG LAKE -----						----- TUALATIN RIVER -----						----- WEATHER -----				----- WATER DELIVERIES -----																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
DAY	SCHO		SCLO	TANO	TOTAL	INFLW	CFS	(4)	W.S.	ELEV	FT	(5)	STOR	CONT	AF	CHNG	STOR	CHNG	REL	CFS	(9)	(10)	COMP	INFLW	CFS	(11)	DILLO	GOLF	CFS	(13)	ROOD	CFS	(14)	FRMO	WSLO	CFS	(16)	PREC	INCH	F	MAX	TEMP	F	(18)	(19)	CFS	(20)	USA	LO	HLS	FG	BVR	CFS	(24)	(25)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	CFS	(1)																																																						(2)	(3)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
1	2	6	0	8	25061	-26	-13	21	8	27	57	38	85	165	219	0.00	64	43	3	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

1995 RESERVOIR STORAGE STATUS (AF):

USED		REMAINING	
TVID	15398	12809	
USA	8872	3746	
LO	505	0	
HLSBO	2414	2586	
FG	595	3905	
BVRTN	3741	259	

DATE:10/31/95
HOUR: 08:00

Recordings at 08:00 hours
 Note: 12.24" precip. is 161% of average for the month of November.
 For 26 years of data collection, this is not a record. Nov. 1984 recorded 14.86" and Nov. 1983 recorded 15.16" of precipitation.

For 26 years of data collection, this is not a record. Nov. 1984 recorded 14.86" and Nov. 1983 recorded 15.16" of precipitation, (note, 12.24" precip. is 101% of average for the month of November).

SCOGGINS DAM - RESERVOIR OPERATIONS For the Month of December 1995

File: 1295

INFLOW				HENRY HAGG LAKE						TUALATIN RIVER						WEATHER			WATER DELIVERIES					
DAY	SCHO	SCLO	TANO	TOTAL	W.S.	STOR	CHNG	CHNG	REL	COMP	GASO	DLLO	GOLF	ROOD	FRMO	WSLO	PREC	TEMP	TVID	USA	LO	HLS	FG	BVR
	CFS	CFS	CFS	CFS	FT	AF	AF	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	INCH	MAX	CFS	CFS	CFS	CFS	CFS	CFS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
1	218	497	23	738	289.96	37370	1901	958	11	969	1168	2168	2865	5397	5143	5787	1.03	53	43	0	0	0	0	0
2	145	379	18	542	291.41	40723	1452	732	11	743	960	2362	2850	6360	6213	6074	0.44	53	36					
3	115	272	13	400	292.49	41816	1093	551	11	562	719	1797	2825	6400	6572	6663	0.02	50	36					
4	108	255	11	374	293.45	42798	982	495	11	506	678	1430	2664	6236	6574	7773	0.38	52	35					
5	96	205	8	309	294.25	43622	824	415	11	426	530	1018	2291	5913	6388	7458	0.00	51	34					
6	78	162	6	246	294.54	43922	300	151	168	319	439	933	2068	5523	6080	7213	0.00	44	28					
7	66	134	5	205	294.21	43580	-342	-172	429	257	387	1057	1889	5067	5670	6700	0.00	44	30					
8	58	119	4	181	293.74	43096	-484	-244	475	231	349	985	1769	4775	5181	6074	0.00	45	34					
9	51	113	4	168	292.99	42326	-770	-388	621	233	330	1074	1670	4108	4644	5420	0.29	34	29					
10	51	109	4	164	292.24	41562	-764	-385	582	197	333	1074	1663	3708	4185	4887	0.10	34	30					
11	194	533	23	750	293.25	42592	1030	519	240	759	1206	1936	2013	3970	4390	5507	2.29	51	34					
12	252	652	30	934	295.13	44535	1943	980	13	993	1242	2518	2543	4598	4867	5835	1.33	53	46					
13	347	802	34	1183	298.12	47701	3166	1596	13	1609	1525	3221	2834	5527	5564	6302	1.43	52	41					
14	284	577	26	887	300.19	49949	2248	1133	13	1146	1132	3035	3135	6732	6685	6549	0.99	47	43					
15	230	543	22	795	301.85	51784	1835	925	415	1340	1149	3395	3113	7350	7490	10986	0.93	47	42					
16	149	379	13	541	302.00	51951	167	84	763	847	824	2644	2880	7270	7530	11084	0.00	46	41					
17	118	265	12	395	301.16	51018	-933	-672	1173	703	627	2416	2793	6800	7330	12370	0.05	45	39					
18	124	298	11	433	299.95	49686	-1332	-672	1364	692	699	2416	2693	6732	7080	11779	0.95	42	38					
19	99	255	9	363	296.16	48825	-861	-434	850	416	571	2154	2662	6412	6870	10560	0.07	42	38					
20	89	196	7	292	298.48	48089	-736	-371	825	454	548	1936	2558	6156	6646	9511	0.10	42	39					
21	76	177	6	259	297.44	46973	-1116	-563	950	387	416	1920	2432	5822	6355	8617	0.02	45	33					
22	69	150	6	225	296.26	45719	-1254	-632	975	343	372	1812	2315	5458	6073	7796	0.00	49	33					
23	73	119	5	197	294.72	44109	-1610	-812	1062	250	337	1767	2222	5081	5688	7108	0.01	49	29					
24	64	105	5	174	293.14	42480	-1629	-821	1048	227	316	1666	2161	4680	5250	6418	0.00	45	28					
25	58	94	4	156	291.71	41025	-1455	-734	985	251	298	1467	2066	4234	4762	5803	0.00	44	27					
26	50	81	3	134	290.39	39700	-1325	-668	899	231	285	1324	1941	3777	4300	5248	0.00	44	30					
27	47	76	3	126	288.89	38213	-1487	-750	913	163	275	1314	1822	3378	3860	4696	T	42	31					
28	44	73	3	120	287.36	36718	-1495	-754	853	99	264	1282	1768	2966	3442	4184	0.06	41	35					
29	72	127	5	204	286.13	35532	-1186	-598	622	24	339	1418	1780	2706	3161	3973	1.03	46	38					
30	55	123	5	183	286.32	35714	182	92	11	103	335	888	1819	2616	3055	3676	0.12	52	44					
31	81	191	6	278	286.10	35503	-211	-106	535	429	598	1102	1817	2593	3026	3631	0.53	57	44					
TOT																	12.17							
CFS	3561	8061	334	11956			-941	16852	15911	19251	55529	71921	158345	170074	215682		MAX	57	46	0	0	0	0	0
AF	7063	15989	662	23715		-1867	-1867	33426	31559	38184	110142	142655	314077	337342	427805		MIN	34	27	0	0	0	0	0

For calendar year 1995, Scoggins Dam received 65.27" total precip (136% normal)
Total release from Scoggins Dam in Dec was 33,426 acre feet or 7% of the total 427,805 acre feet measured in the Tualatin River at West Linn for Dec. 1995

**Tualatin River
Water Quality Information Graphs**

APPENDIX D

APPENDIX D - TUALATIN RIVER WATER QUALITY GRAPHS

UNIFIED SEWERAGE AGENCY

Three graphs have been prepared to show the spatial (head waters to mouth - longitudinal) and temporal (before and after the TMDL- period) trends in water quality. The mean value between May and October was used to calculate each data point. Each graph has the river mile along the Tualatin River on the x-axis going from the upper watershed on the left to the mouth on the right. The symbol for each line on the graphs is the last digit of the year that the line represents. On graph 1 - Total Phosphorus and graph 2 Ammonia, the double line shows the Total Maximum Daily Load (TMDL) at that river mile. The key for these graphs shows the mean level of total phosphorus or ammonia from the two summer-discharging wastewater treatment plants for the given year. The Rock Creek Wastewater Treatment Plant (RC) is at river mile 38. The Durham Wastewater Treatment Plant (DHM) is at river mile 9. The double line on graph 3 Chlorophyll *a* shows the Oregon Target Level for rivers.

Graph 1.

Total Phosphorus shows moderate reductions in total phosphorus since 1989 that have brought the river in compliance with the TMDL above river mile 50. There have been moderate reductions between river mile 50 and 38 also, but the river is not in compliance with the TMDL. Below river mile 38 there have been dramatic reductions in total phosphorus because the wastewater treatment plants are in compliance with their waste load allocations. However, the river is not in compliance with the TMDL.

Graph 2.

Chlorophyll *a* shows that the mean summer levels have not been significantly impacted by the reductions in total phosphorus in the reservoir section, below river mile 27. The actual target level uses a three-month moving average. These levels are also exceeded in the same area of the Tualatin River during the summer months.

The Department of Environmental Quality (DEQ) has set up a committee called the Tualatin Basin Technical Advisory Committee. It will evaluate the Total Phosphorus nonpoint TMDL in light of new information on background levels of total phosphorus in the basin and the ability to control algae by controlling total phosphorus levels. The deadline for compliance was recently extended from December 1995 to March 1997.

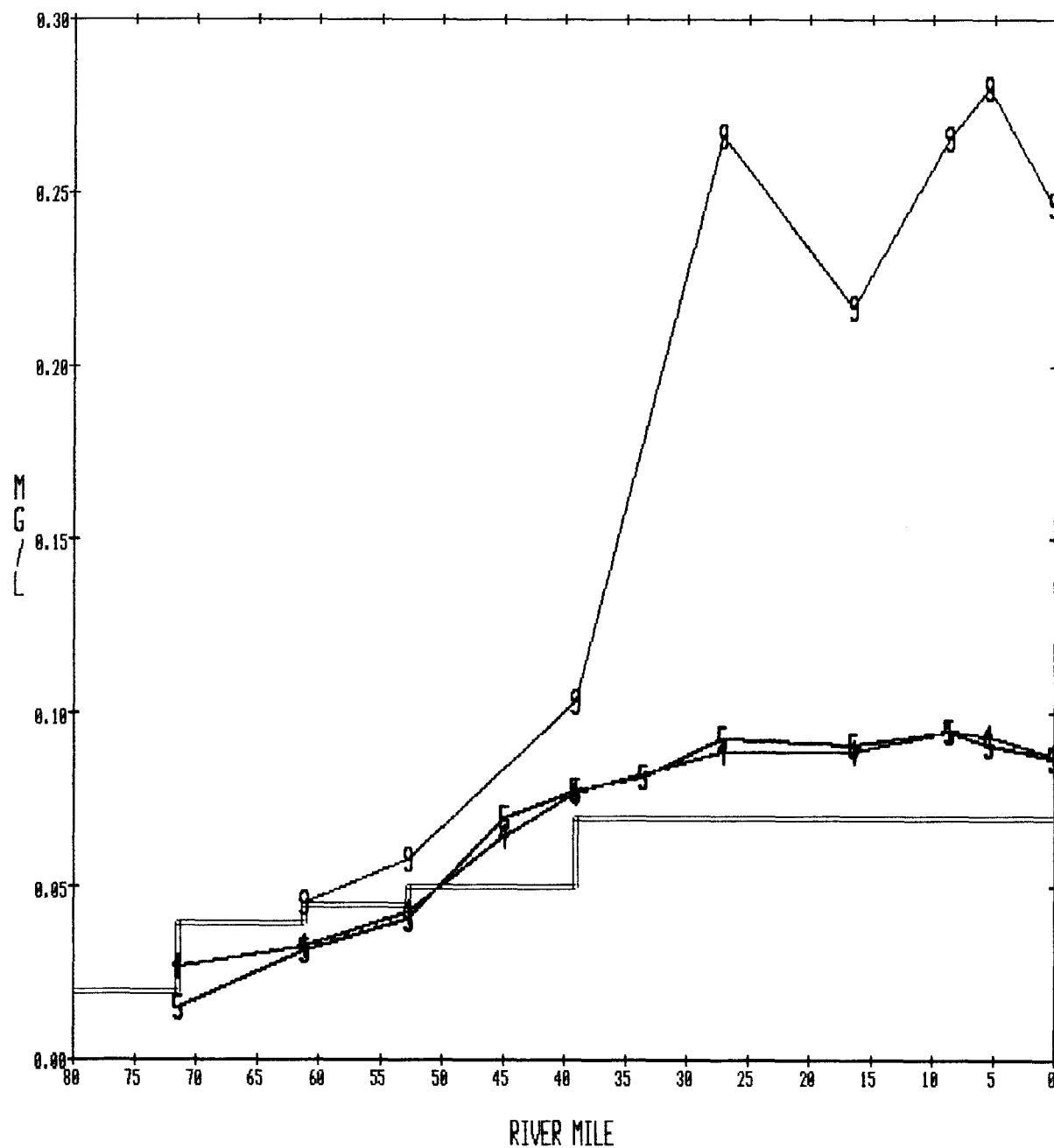
Graph 3.

Ammonia shows dramatic reductions in ammonia since 1988. Because the Rock Creek Wastewater Plant was already reducing ammonia discharges in 1989 when the TMDL was established, it was necessary to go back to 1988 to see the true impact on the river before ammonia was officially identified as a problem. The wastewater treatment plants are in compliance with their waste load allocations. The Tualatin River currently meets the TMDL for ammonia. Even with the Tualatin River comfortably meeting the ammonia TMDL downstream of the Rock Creek Wastewater

Treatment Plant, it is being upgraded again to reduce ammonia levels. These levels are increasing due to higher flows as the area population grows and transfers of flow from the two non-discharging treatment plants to the Rock Creek Wastewater Treatment Plant. Some upgrades will be complete before the summer of 1996 and the rest will be done before the summer of 1997.

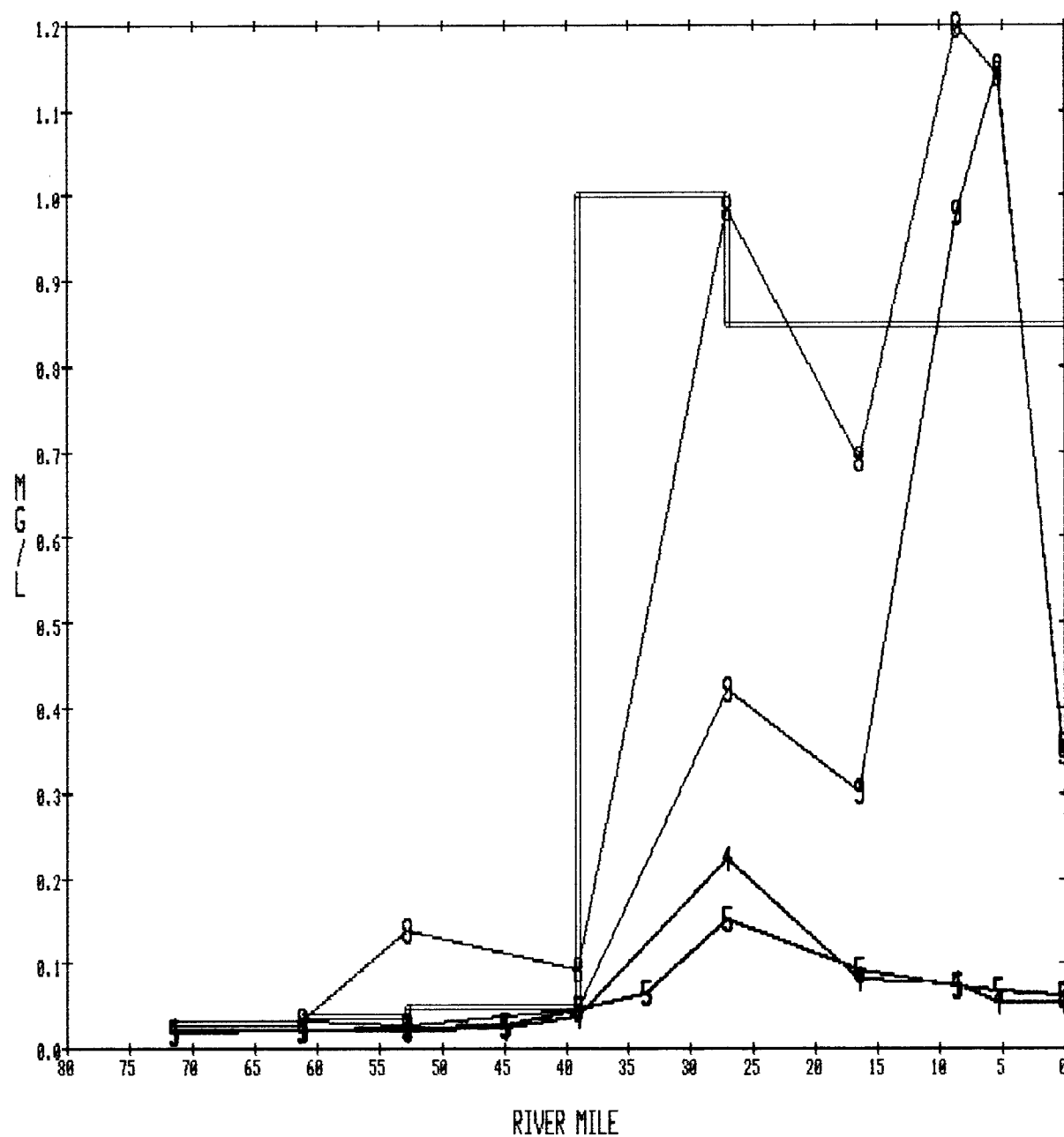
P:\TOMVVG_OVER.WPD

TUALATIN RIVER
MEAN CONCENTRATION OF TOTAL PHOSPHORUS
MAY TO OCTOBER



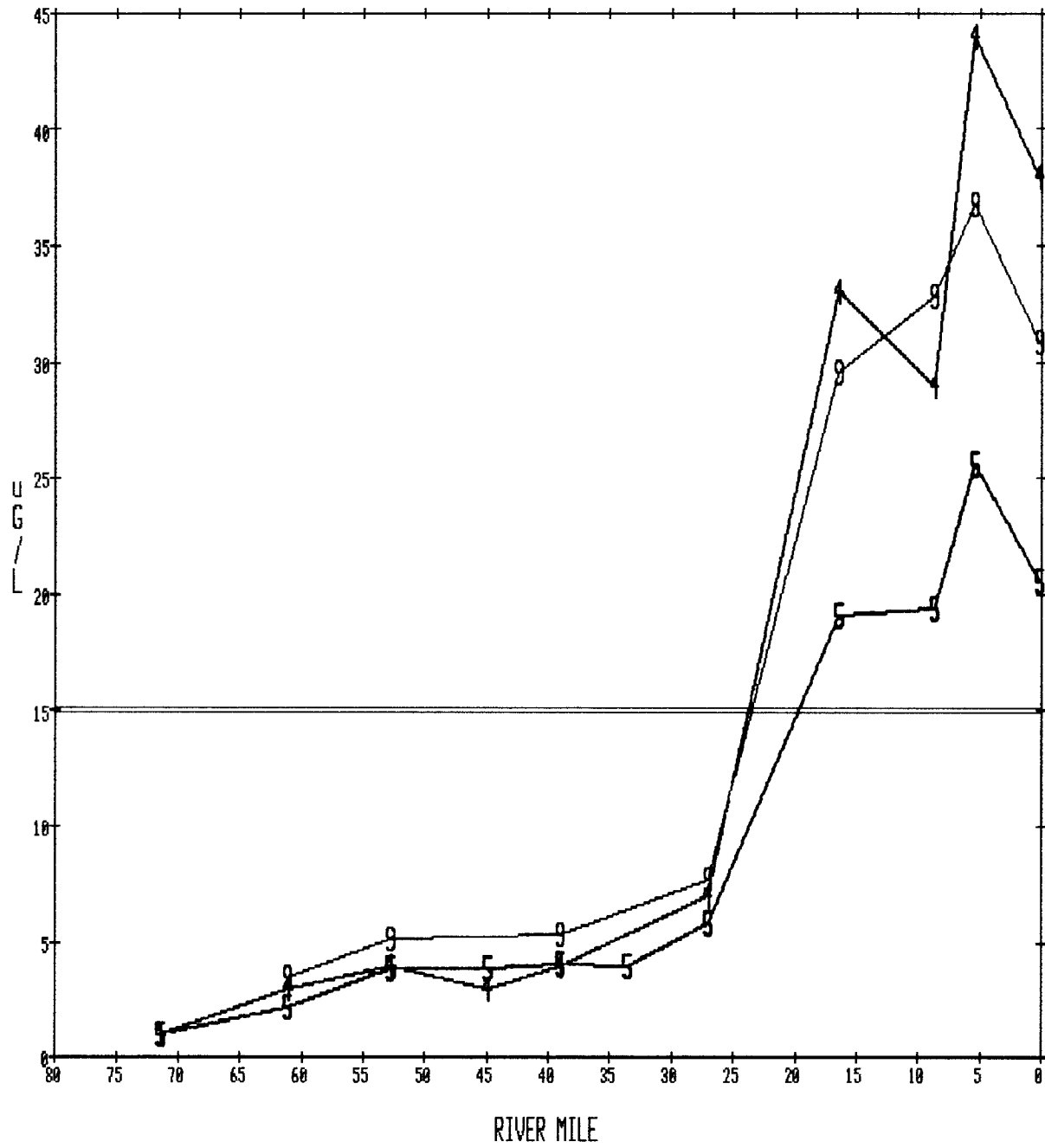
—○— 1989 (RC 1.89 MG/L, DHM 1.58 MG/L)
 —+— 1994 (RC 0.06 MG/L, DHM 0.05 MG/L)
 —●— 1995 (RC 0.07 MG/L, DHM 0.04 MG/L)
 ——— TMDL

TUALATIN RIVER
MEAN CONCENTRATION OF AMMONIA
MAY TO OCTOBER



- 1988 (RC 22.8 MG/L, DHM 12.6 MG/L)
- 1989 (RC 5.32 MG/L, DHM 12.8 MG/L)
- ▲— 1994 (RC 2.87 MG/L, DHM 0.12 MG/L)
- 1995 (RC 1.33 MG/L, DHM 0.08 MG/L)
- ==== TMDL

TUALATIN RIVER
MEAN CONCENTRATION OF CHLOROPHYLL a (CORRECTED)
MAY TO OCTOBER



—○— 1989
—+— 1994
—5— 1995
==== TARGET LEVEL 15 ug/l

**Tualatin River
River Miles Index**

APPENDIX E

**TUALATIN RIVER
RIVER MILE INDEX
(0211400300)**

<u>Mile miles</u>	<u>Description</u>	<u>Drainage Area sq. miles</u>	<u>Elevation 0.00 Gage Datum feet</u>
0.00	Mouth of Tualatin River at Willamette River River Mile 28.5 (LB Willamette)		
0.20	Weiss Bridge- Petes Mtn Rd.		
1.60	Fields Creek (RB-02114003000010)		
1.69	State Hwy 212 Bridge (Fields Bridge)		
1.75	West Linn Stream Gage Station (USGS #14-2075.0)	706	85.61
2.40	Tate Creek (LB-02114003000020)		
3.45	Lake Oswego Corp. Diversion Dam		
4.25	Interstate 205 Bridge		
4.56	Wilson Creek (LB-02114003000080)		
5.34	Boat Launch -LB		
5.36	Shipley Creek (LB-02114003000100)		
5.38	Shipley Bridge- Stafford Rd. (NWS Wire Weight Gage)		
5.62	Pecan Creek (LB-02114003000120)		
6.02	Athey Creek (RB-02114003000123)		
6.70	Saum Creek (RB-02114003000130)		
6.70	Oswego Canal Diversion (LB; River Elevation Recording Gage, Headgate, and Canal Recording Gage #14-2070.00)		100.20
7.36	Boat Launch - LB (Dogwood Drive)		

<u>River Mile miles</u>	<u>Description</u>	<u>Drainage Area sq. miles</u>	<u>Elev. feet</u>
7.83	Clackamas/Washington Counties Line (Underground Cable Crossing Sign)		
8.18	Interstate 5 Bridge		
8.60	Boones Ferry Road Bridge		
8.64	Hedges Creek (RB-02114003000150)		
8.90	Tualatin Park Boat Launch (RB) Southern Pacific RR Bridge		
9.32	<u>Fanno Creek</u> (LB-02114003000180)	26.8	
9.33	Durham Treatment Plant Outfall (LB)		
9.34	Oregon Electric RR Bridge		
9.80	Cook Park Boat Launch (LB)		
11.50	Hwy. 99W Bridge (Pacific Highway)		
12.68	Overhead BPA Transmission Line; Vancouver-Eugene		
12.80	Rivermeade Boat Launch (Private)		
15.20	<u>Rock Creek-South</u> (RB-02114003000250)	13.7	
15.50	<u>Chicken Creek</u> (RB-02114003000270)		
16.09	Chicken Creek Drainage Ditch (RB)		
16.22	Shamberg Bridge (Elsner Road) Rated Staff Gage for Stream Flow		
21.12	Overhead BPA Transmission Line; Big Eddy-Keeler		
26.90	State Hwy. 210 bridge (Scholls)		
28.20	<u>McFee Creek</u> (RB-02114003000310)		
30.76	Unnamed Stream (LB-02114003000320) (Jacktown)		

River Mile miles	<u>Description</u>	Drainage <u>Area</u> sq. miles	<u>Elev.</u> feet
31.62	<u>Burris Creek</u> (RB-02114003000330)		
31.92	<u>Christensen Creek</u> (RB-02114003000350)		
33.30	Harris Bridge (State Highway 208) Farmington Recording Stream Gage (#14-2065.00) (LB)	568	100.42
35.68	<u>Butternut Creek</u> (LB-02114003000380)		
37.38	Gordon Creek (LB-02114003000400)		
38.08	Rock Creek Treatment Plant Outfall (LB)		
38.09	<u>Rock Creek</u> (LB-02114003000420) <u>Beaverton Creek</u> (LB-02114003000420060)	74.6 36.0	
38.44	Rood Bridge Road Bridge Tualatin River at Rood Bridge Recording Stream Gage		105.16
40.44	Davis Creek (RB-02114003000430)		
41.64	Minter Bridge Road Bridge		
43.88	Jackson Slough (LB) Jackson Bottom Wetlands Hillsboro Treatment Plant Effluent Outfall (LB)		
44.40	State Highway 219 Bridge Rated Staff Gage for Stream Flow		
44.73	Dairy Creek (LB-02114003000480) - index available <u>Mckay Creek</u> (LB-02114003000480020) East Fork Dairy Creek (02114003000480080) - index available West Fork Dairy Creek (02114003000480090) - index available	226 63.4	
51.54	Golf Course Road Bridge Tualatin River at Golf Course Road Bridge Recording Stream Gage		126.22
53.74	LaFollett Road (Bridge to be removed - Fall of 94)		
55.24	Forest Grove Treatment Plant Outfall Fern Hill Wetlands		

River <u>Mile</u> miles	<u>Description</u>	Drainage <u>Area</u> sq. miles	<u>Elev.</u> feet
55.32	Fernhill Road Bridge		
56.10	Springhill Pump Plant Intake		
56.80	Gales Creek (LB-02114003000560) - index available	78.6	
57.38	<u>Carpenter Creek</u> (LB-02114003000580)		
57.84	Dilley Creek (LB-02114003000600)		
58.04	Johnson Creek (LB-02114003000602)		
58.82	Springhill Road Bridge Tualatin River at Dilley Stream Gage (LB) (USGS 14-2035.00)	125	147.57
59.02	O'Neil Creek (LB-02114003000620)		
60.00	<u>Scoggins Creek</u> (LB-02114003000640)		
60.80	Wapato Creek (RB-02114003000670) Wapato Creek Improvement District Return Flow		
62.00	Wapato Improvement District Headgate (RB)		
62.24	Southern Pacific RR Bridge		
62.25	State Highway 47 Bridge (Gaston)		
62.30	Bates Road Bridge		
62.80	Black Jack Creek (LB-02114003000700)		
62.90	Overhead BPA Transmission Line; Forest Grove-McMinnville		
63.13	TVID Patten Valley Pump Station Outfall #1		
63.87	Tualatin River at Gaston Recording Stream Gage (RB) (14-2025.00)	48.5	
64.26	TVID Patten Valley Pump Station Outfall #2		
65.34	Williams Canyon (RB-02114003000730)		

River Mile miles	<u>Description</u>	Drainage <u>Area</u> sq. miles	<u>Elev.</u> feet
65.90	Mt. Richmond Road Bridge		
67.30	Hering Creek (LB-02114003000760)		
67.83	South Road Bridge (Cherry Grove)		
68.44	Roaring Creek (RB-02114003000790)		
69.42	Little Lee Falls		
70.70	Raines Bridge- Tualatin River below Lee Falls Rated Staff Gage for Stream Flow (LB)		
71.07	Lee Falls		
73.28	Haines Falls		
73.30	City of Hillsboro Haines Falls Intake		
74.00	Lee Creek (LB-02114003000860)		
74.05	Patten Creek (RB-02114003000870)		
75.70	Sunday Creek (LB-02114003000900)		
76.60	Maple Creek (LB-02114003000940)		
78.00	Barney Reservoir Aqueduct Outfall (RB)		
79.3+	Headwaters of Tualatin River		

River miles based on USGS 1:24000 quad maps

Underlined tributaries indicate planned stream mile index

Prepared by Tualatin Basin Watermaster - Revision Date January 1996

111 NE Lincoln, 220L MS49

Hillsboro, OR 97124

Call (503) 693-4881 with any corrections or omissions.

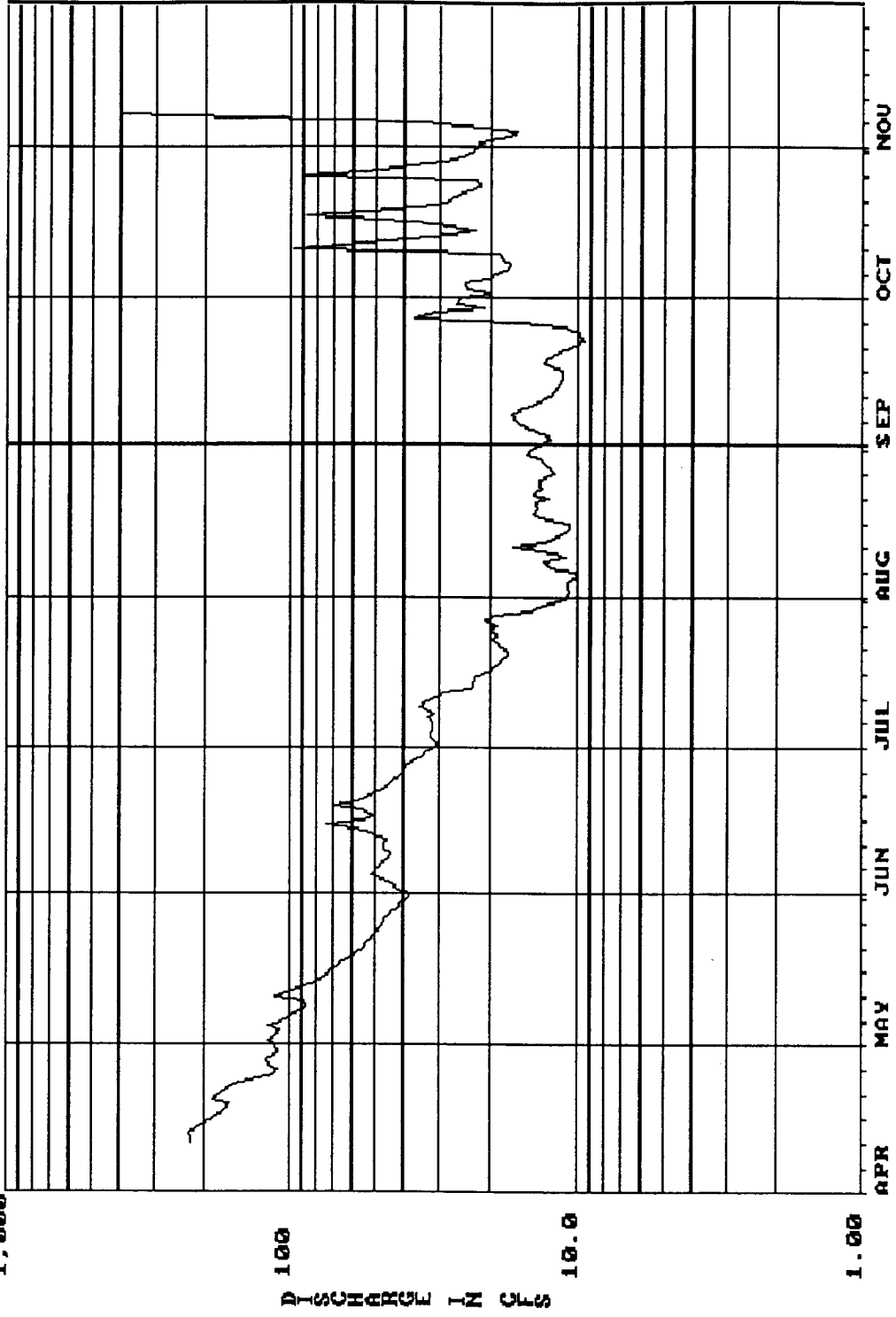
**Stream Records
Hydrographs and Daily Discharge Tables**

APPENDIX F

Stream Records

Hydrographs and
Daily Discharge Tables

1,000 14202500 Tualatin River Near Gaston Oregon 1995



OREGON WATER RESOURCES DEPARTMENT
14202500 Tualatin River Near Gaston Oregon

Latitude: 452611 Longitude: 1231007 River Mile: 63.87
Drainage Area: 48.5

DAILY DISCHARGE IN CUBIC FEET PER SECOND FOR 1995

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1					114	38	31	11	13	25	22	
2					120	42	31	11	12	20	22	
3					114	44	33	11	13	24	17	
4					110	48	33	11	15	25	17	
5					119	52	32	10	16	21	22	
6					107	49	32	10	17	19	35	
7					99	49	33	13	17	18	148	
8					93	46	31	13	16	17	401	
9					88	45	36	11	15	18		
10					90	47	35	12	13	19		
11				222	114	47	32	17	13	98		
12				224	102	46	29	13	12	65		
13				229	90	51	24	12	12	39		
14				217	81	54	23	11	12	27		
15				205	76	74	23	11	11	23		
16				189	72	56	21	11	11	31		
17				178	70	52	20	14	12	49		
18				172	68	56	19	14	13	88		
19				165	62	70	18	14	12	43		
20				189	59	58	18	14	12	31		
21				178	56	52	18	13	11	28		
22				169	54	49	19	14	9.6	26		
23				160	52	46	20	13	9.7	24		
24				138	50	44	19	14	9.9	22		
25				115	49	42	20	14	11	22		
26				112	48	41	19	12	16	92		
27				120	47	40	21	13	37	56		
28				121	45	38	19	13	31	38		
29				114	43	35	15	14	21	29		
30				111	42	34	13	15	26	25		
31					39		12	15		23		
TOTAL				3,328	2,373	1,445	749	394	449.2	1,085	684	
MEAN				166	76.5	48.2	24.2	12.7	15.0	35.0	85.5	
MAX				229	120	74	36	17	37	98	401	
MIN				111	39	34	12	10	9.6	17	17	
AC-FT				6,600	4,710	2,870	1,490	781	891	2,150	1,360	*
YEAR 1995				TOTAL*	10,507.2	MEAN	49.6	MAX	401	MIN	9.6	AC-FT
												20,840

* Incomplete Record Period of Record Max on November 8: GH 9.83 = 697 cfs
Period of Record Min on September 22: GH 3.33 = 9.6 cfs
Source Agency : Tualatin Basin Watermaster
Provisional Data: subject to revision

STATION NUMBER 14202980 SCOGGINS CREEK BL HENRY HAGG LK NR GASTON, OREG. STREAM SOURCE AGENCY USGS
 LATITUDE 452810 LONGITUDE 1231156 DRAINAGE AREA 38.80 DATUM 187.48 STATE 41 COUNTY 067
 PROVISIONAL DATA SUBJECT TO REVISION

DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY TO DECEMBER 1995
 DAILY MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	621	11	69	31	78	39	143	164	152	20	62	11
2	627	9.0	54	31	88	57	143	163	155	55	62	11
3	606	122	11	33	73	70	125	163	155	79	61	11
4	664	232	12	34	65	69	113	172	155	68	61	11
5	789	345	12	72	72	69	113	178	142	58	61	104
6	841	552	12	92	77	57	113	178	134	56	61	340
7	810	640	12	150	77	44	109	200	134	56	61	468
8	691	674	89	185	63	41	107	236	128	56	38	569
9	283	748	177	185	46	57	107	226	122	63	20	612
10	13	772	181	185	51	70	101	225	122	71	20	459
11	13	753	181	127	81	70	98	225	122	71	21	13
12	17	684	179	181	77	70	106	225	143	47	20	13
13	12	283	196	200	67	57	111	224	170	25	21	13
14	13	11	214	94	67	43	119	217	173	21	20	261
15	13	294	212	61	48	21	132	208	158	21	20	570
16	13	520	378	61	40	14	132	207	146	41	20	1050
17	213	221	556	61	32	14	150	199	146	63	20	1290
18	447	12	610	61	47	14	171	190	136	58	20	1150
19	537	13	593	61	66	14	171	187	122	55	20	829
20	892	13	311	61	29	14	170	187	119	54	20	885
21	1000	13	294	62	29	14	170	171	124	54	20	962
22	974	49	294	62	33	14	170	181	127	54	20	1080
23	987	77	292	62	38	48	169	183	115	54	20	1130
24	1000	118	200	62	35	84	151	174	122	54	21	1010
25	1010	145	126	63	25	90	140	174	127	54	21	903
26	769	144	126	63	28	118	130	173	111	34	21	898
27	585	99	114	47	35	134	134	173	82	21	40	974
28	566	69	98	53	35	136	149	173	39	21	37	923
29	239	---	82	63	35	147	153	164	19	21	22	390
30	13	---	57	63	37	144	153	157	19	44	15	226
31	14	---	38	---	39	---	153	153	---	62	---	528
TOTAL	15272	7623.0	5780	2566	1613	1833	4206	5850	3719	1511	946	17694
MEAN	493	272	186	85.5	52.0	61.1	136	189	124	48.7	31.5	571
MAX	1010	772	610	200	88	147	171	236	173	79	62	1290
MIN	12	9.0	11	31	25	14	98	153	19	20	15	11
AC-FT	30290	15120	11460	5090	3200	3640	8340	11600	7380	3000	1880	35100

CAL YR 1995 TOTAL 68613.0 MEAN 188 MAX 1290 MIN 9.0 AC-FT 136100

STATION NUMBER 14203500 TUALATIN RIVER NEAR DILLEY, OREG. STREAM SOURCE AGENCY USGS
LATITUDE 452830 LONGITUDE 1230723 DRAINAGE AREA 125.00 DATUM 147.57 STATE 41 COUNTY 067**PROVISIONAL DATA**

SUBJECT TO REVISION

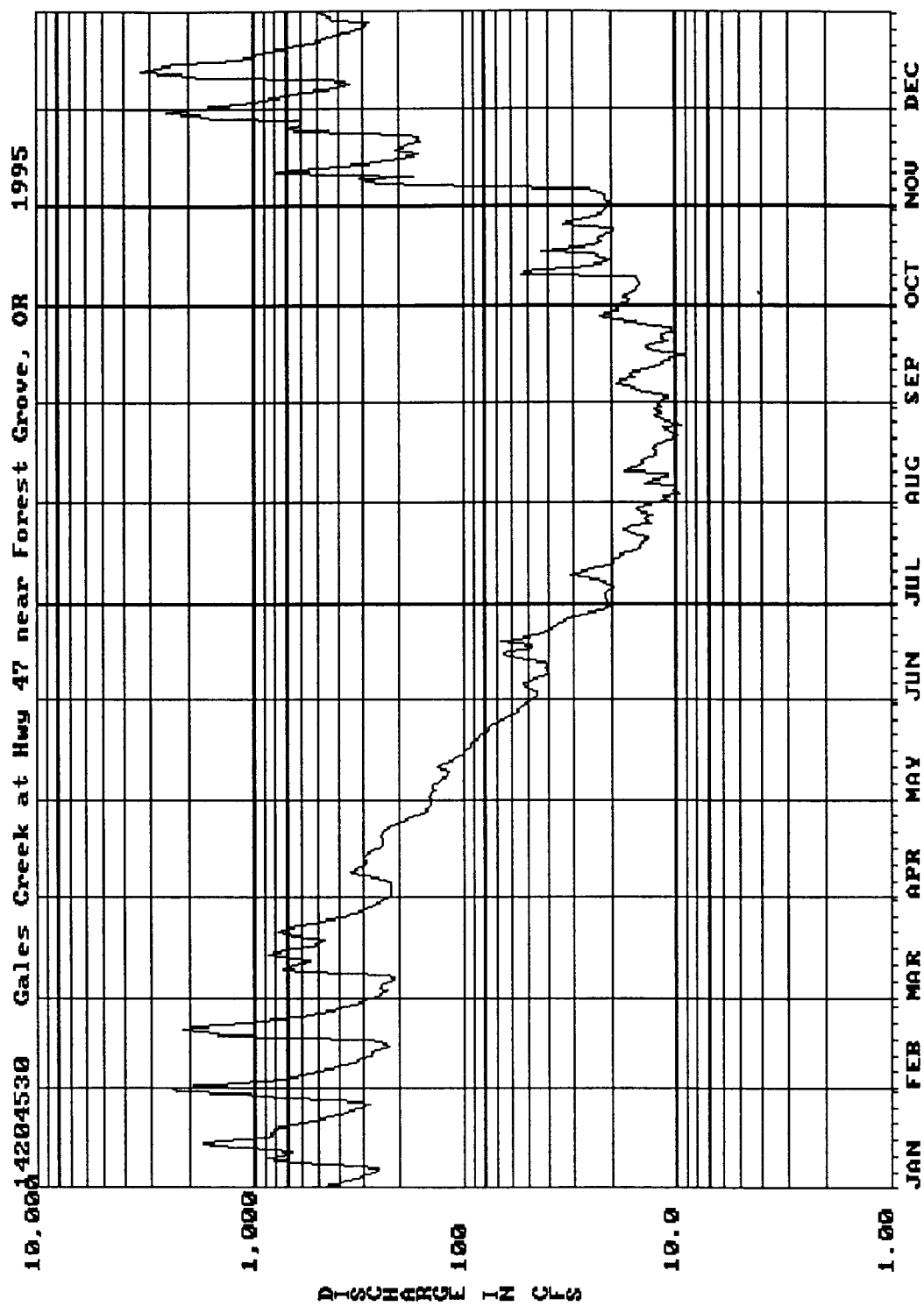
DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY TO DECEMBER 1995
DAILY MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1270	e2460	370	265	223	75	165	157	153	55	106	2530
2	1270	e1890	335	244	244	81	166	162	158	67	107	2200
3	1150	1270	263	228	226	117	161	159	159	104	102	1790
4	1050	1120	261	219	208	118	144	167	162	101	100	1450
5	1080	945	256	233	220	129	143	174	156	83	105	1090
6	1160	1010	229	256	219	127	141	177	147	78	118	1040
7	1210	1160	212	368	210	109	141	186	148	77	193	1130
8	1230	1110	263	496	197	99	136	229	145	77	350	1090
9	1450	1100	575	521	169	100	139	211	133	81	428	1160
10	1490	1120	816	503	169	116	140	213	131	92	262	1240
11	1210	1090	870	467	214	126	132	219	129	155	691	2160
12	1000	1000	770	445	214	125	133	219	141	136	1340	2640
13	1220	830	819	518	190	121	134	220	170	82	697	3240
14	2010	426	1170	444	179	114	132	214	175	63	572	3140
15	2320	433	1190	373	160	114	149	199	165	57	445	3200
16	1930	714	1020	338	140	100	147	199	148	70	343	2600
17	1470	1430	1130	312	135	87	153	198	150	117	277	2390
18	2020	1740	1180	297	123	86	172	190	147	158	313	2410
19	1920	2060	1150	280	163	105	171	187	134	115	292	2140
20	2050	2150	1180	316	117	97	170	188	127	102	251	1980
21	2050	1390	1150	301	111	87	170	178	133	98	220	1920
22	1940	905	1070	283	107	81	172	174	136	101	219	1850
23	1800	742	914	266	109	90	174	184	128	97	223	1830
24	1730	651	770	250	107	129	164	175	129	95	485	1700
25	1640	604	611	237	96	132	149	175	139	93	691	1550
26	1500	552	541	225	90	146	142	173	134	142	710	1390
27	1090	493	492	212	98	172	141	173	128	106	690	1410
28	1050	416	442	214	96	162	153	172	96	84	1910	1370
29	1400	---	398	219	92	172	155	166	52	75	2430	1340
30	1220	---	344	215	87	170	155	162	54	78	2930	739
31	2140	---	297	---	83	---	154	158	---	106	---	1250
TOTAL	47070	30811	21088	9545	4796	3487	4698	5758	4107	2945	17600	56969
MEAN	1518	1100	680	318	155	116	152	186	137	95.0	587	1838
MAX	2320	2460	1190	521	244	172	174	229	175	223	2930	3240
MIN	1000	416	212	212	83	75	132	157	52	55	100	739
AC-FT	93360	61110	41830	18930	9510	6920	9320	11420	8150	5840	34910	113000

CAL YR 1995 TOTAL 208874 MEAN 572 MAX 3240 MIN 52 AC-FT 414300

e Estimated

*No Chart
just Table**B5*



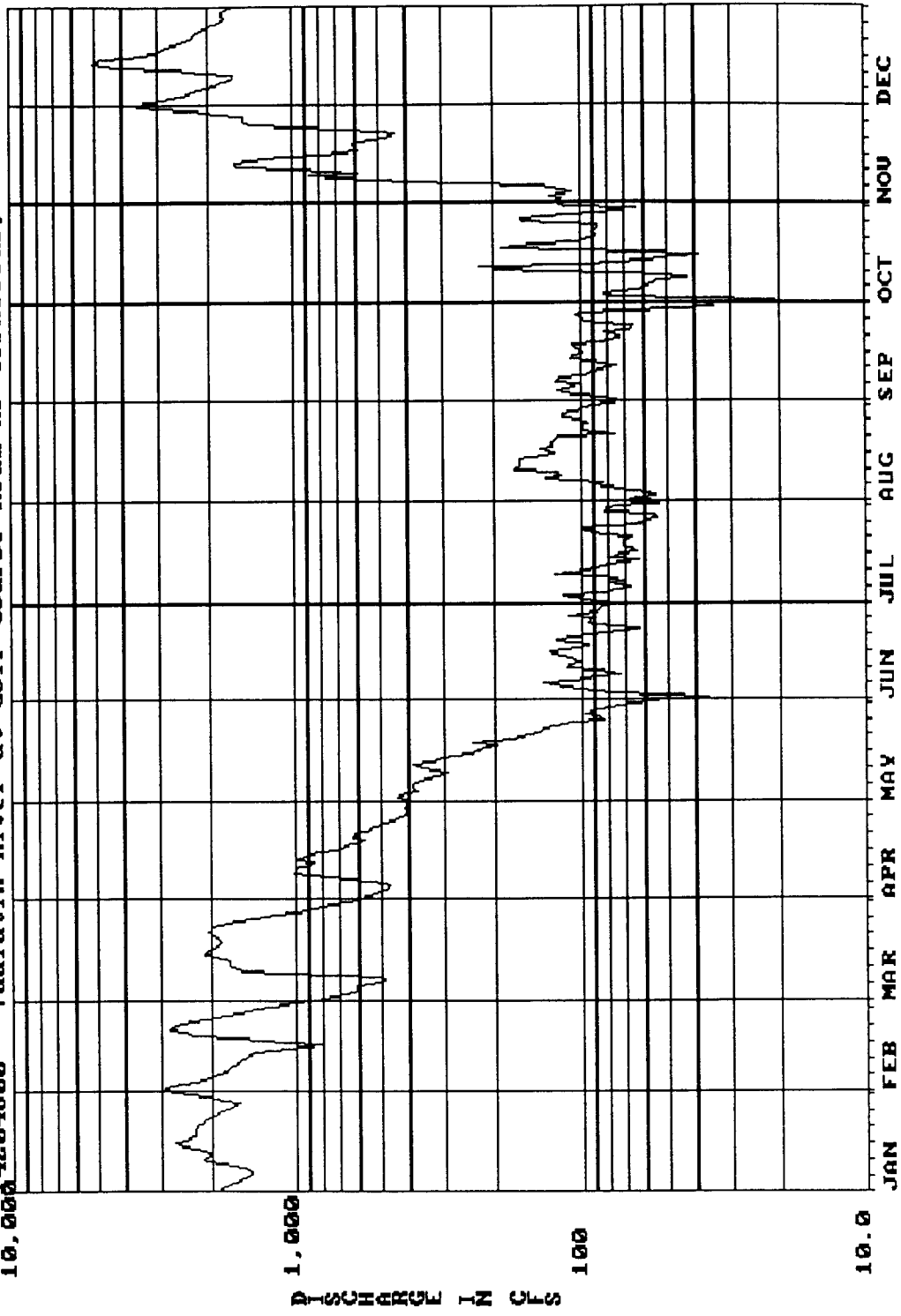
OREGON WATER RESOURCES DEPARTMENT
 14204530 Gales Creek at Hwy 47 near Forest Grove, OR
 Latitude: 453039 Longitude: 1230652 Stream Mile: 2.36

DAILY DISCHARGE IN CUBIC FEET PER SECOND FOR 1995

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	492	2,490	272	227	143	48	22	13	12	19	21	1,860
2	421	1,510	251	223	148	46	21	11	11	17	21	1,420
3	366	956	234	223	142	46	22	11	11	17	22	999
4	324	734	255	222	139	46	22	9.6	14	18	22	908
5	293	596	245	222	143	52	21	10	16	16	23	715
6	267	502	221	222	135	53	20	10	17	15	26	585
7	262	435	219	267	129	48	22	14	19	15	85	469
8	314	383	230	342	125	44	22	15	13	15	252	387
9	664	338	558	348	120	40	27	11	16	15	314	352
10	906	305	739	314	118	40	32	11	16	16	173	436
11	741	281	657	298	135	42	27	17	14	53	791	1,750
12	666	279	550	295	123	40	24	16	13	46	623	2,320
13	848	259	677	309	116	43	20	15	12	30	394	3,370
14	1,540	229	870	292	109	56	20	15	11	23	300	2,760
15	1,730	250	810	280	103	66	19	13	11	20	234	2,360
16	1,150	294	655	258	99	61	19	12	9.3	22	194	1,460
17	854	1,490	540	245	98	48	17	12	13	25	165	1,030
18	851	1,480	489	243	94	48	15	13	14	43	214	1,000
19	828	2,180	465	242	91	68	15	12	13	29	200	875
20	713	1,870	641	248	88	55	14	12	11	25	179	742
21	607	1,110	766	242	84	46	14	10	12	23	161	625
22	520	780	744	241	79	43	15	9.9	12	23	168	536
23	447	606	625	216	77	39	17	11	10	22	180	466
24	394	502	522	201	76	37	18	12	11	20	603	410
25	354	429	442	185	70	35	16	9.4	13	20	702	361
26	319	377	384	170	66	32	13	11	16	34	602	323
27	287	333	340	155	62	30	14	12	22	31	597	296
28	404	298	307	151	58	26	13	13	23	26	1,510	288
29	760	-----	281	149	57	22	14	12	19	24	1,850	427
30	1,160	-----	261	145	54	21	15	13	19	22	2,530	437
31	2,290	-----	243	-----	50	-----	15	12	-----	22	-----	508
TOTAL	21,772	21,296	14,493	7,175	3,131	1,321	585	375.9	429.3	746	13,156	30,475
MEAN	702	761	468	239	101	44.0	18.9	12.1	14.3	24.1	439	983
MAX	2,290	2,490	870	348	148	68	32	17	23	53	2,530	3,370
MIN	262	229	219	145	50	21	13	9.4	9.3	15	21	288
AC-FT	43,180	42,240	28,750	14,230	6,210	2,620	1,160	746	852	1,480	26,090	60,450
YEAR 1995	TOTAL	114,955.2	MEAN	315	MAX	3,370	MIN	9.3	AC-FT	228,000		

* Incomplete Record Yearly Max Gage Height and Discharge on December 13 at 1000: 17.56 - 3670 cfs
 Yearly Min Gage Height and Discharge on August 25 at 1800: 0.59 - 8.1 cfs
 Source Agency: Tualatin Basin Watermaster
 Provisional Data: Subject to revision

10,000 4204800 Tualatin River at Golf Course Road nr Cornelius, OR. 1995



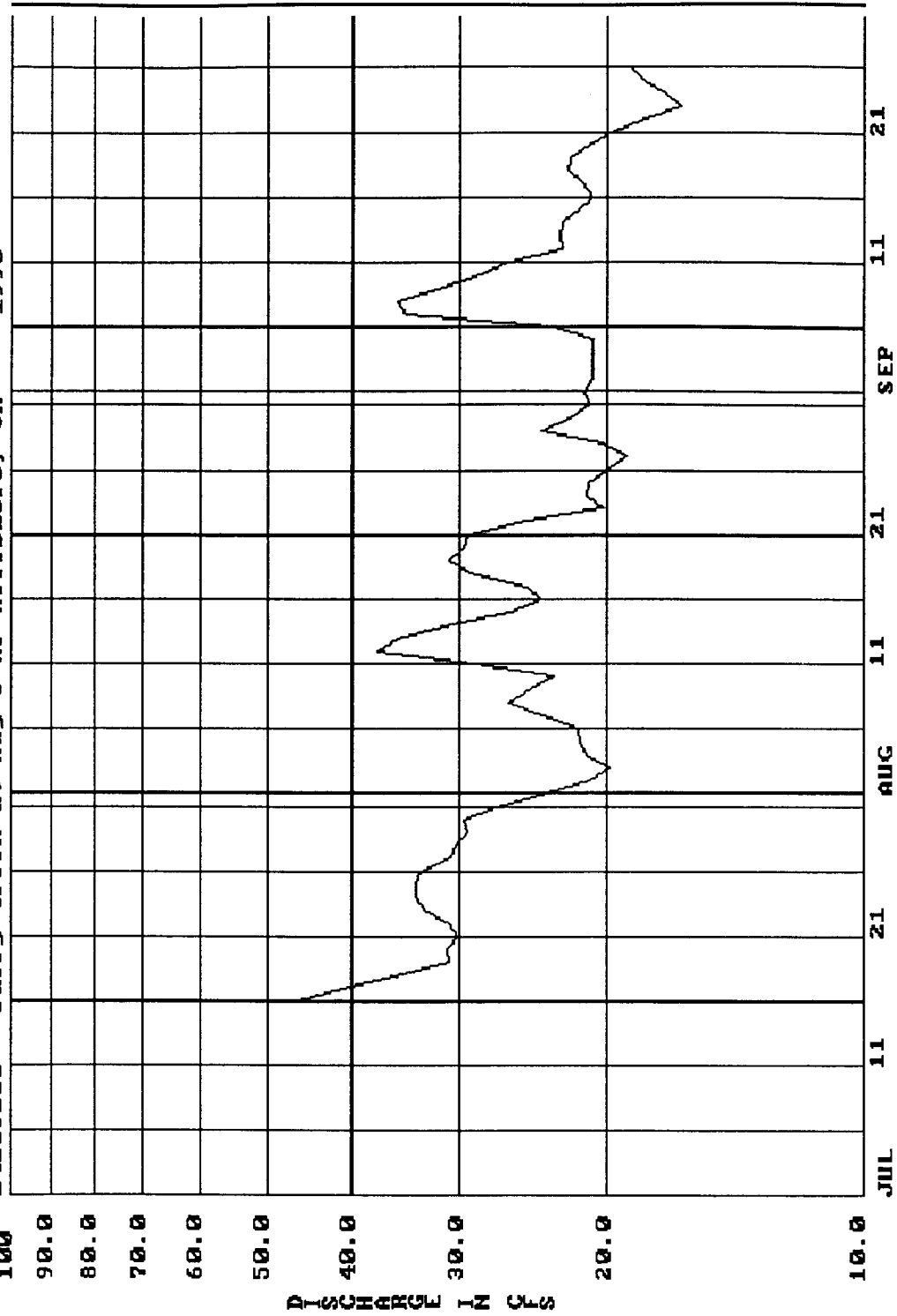
OREGON WATER RESOURCES DEPARTMENT
 14204800 Tualatin River at Golf Course Road nr Cornelius, OR.
 Latitude: 453008 Longitude: 1230318 River Mile: 51.54
 Daily Mean Values

DAILY DISCHARGE IN CUBIC FEET PER SECOND FOR 1995

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1,930	2,990	864	601	393	51	77	48	71	37	123	3,700
2	1,840	2,940	747	555	440	36	98	68	83	21	117	3,070
3	1,760	2,570	631	509	408	78	118	56	107	77	128	2,750
4	1,650	2,280	615	485	376	91	82	59	121	84	108	2,470
5	1,550	2,050	616	474	391	116	77	74	114	63	117	2,270
6	1,480	1,880	546	493	391	136	68	90	103	59	139	2,050
7	1,460	1,790	498	636	369	110	81	85	123	57	256	1,880
8	1,480	1,740	507	917	341	88	72	135	119	55	539	1,770
9	1,680	1,670	1,110	1,030	302	74	82	120	98	43	882	1,680
10	2,070	1,600	1,550	1,000	295	87	125	121	91	68	597	1,660
11	2,150	1,540	1,720	950	357	114	96	170	83	142	964	2,090
12	2,060	1,490	1,740	861	393	111	83	165	76	223	1,610	2,660
13	2,050	1,410	1,740	986	337	103	81	166	94	98	1,620	4,170
14	2,260	1,060	1,940	938	301	112	64	165	109	60	1,420	5,140
15	2,560	818	2,110	817	274	126	79	134	108	47	1,080	4,790
16	2,680	1,110	2,060	729	229	131	73	125	99	39	784	3,820
17	2,460	1,630	1,940	666	232	104	65	140	105	104	593	3,060
18	2,310	2,320	1,870	626	199	95	67	127	109	187	612	2,910
19	2,330	2,530	1,850	581	239	124	72	128	87	145	620	2,820
20	2,300	2,850	1,910	643	178	125	72	126	75	102	543	2,590
21	2,260	2,710	2,020	623	152	93	67	121	74	95	467	2,430
22	2,200	2,380	2,070	573	141	85	84	77	83	89	443	2,320
23	2,110	2,060	2,000	530	137	64	96	100	68	91	496	2,230
24	2,010	1,810	1,850	491	123	91	102	100	66	89	948	2,160
25	1,930	1,600	1,650	454	107	95	63	96	90	88	1,410	2,060
26	1,840	1,410	1,410	431	86	93	64	101	102	158	1,520	1,930
27	1,710	1,220	1,190	411	87	111	55	117	104	163	1,520	1,810
28	1,590	1,020	1,010	410	97	89	57	118	103	111	1,860	1,760
29	1,810	-----	868	421	88	89	83	106	47	87	2,330	1,800
30	2,100	-----	755	411	74	85	83	97	35	65	3,110	1,780
31	2,380	-----	664	-----	67	-----	76	91	-----	113	-----	1,660
TOTAL	62,000	52,478	42,051	19,252	7,604	2,907	2,462	3,426	2,747	2,860	26,956	79,290
MEAN	2,000	1,874	1,356	642	245	96.9	79.4	111	91.6	92.3	899	2,558
MAX	2,680	2,990	2,110	1,030	440	136	125	170	123	223	3,110	5,140
MIN	1,460	818	498	410	67	36	55	48	35	21	108	1,660
AC-FT	123,000	104,100	83,410	38,190	15,080	5,770	4,880	6,800	5,450	5,670	53,470	157,300
YEAR 1995	TOTAL	304,033	MEAN	833	MAX	5,140	MIN	21	AC-FT	603,000		

* Incomplete Record Yearly Max Gage Height and Discharge on December 14 at 0000: 24.78' - 5510 cfs
 Yearly Min Gage Height and Discharge on June 2 at 2100: 4.72' - 13.1 cfs
 Source Agency: Tualatin Basin Watermaster
 Provisional Data: subject to revision

14206200 Dairy Creek at Hwy 8 nr Hillsboro, OR 1995



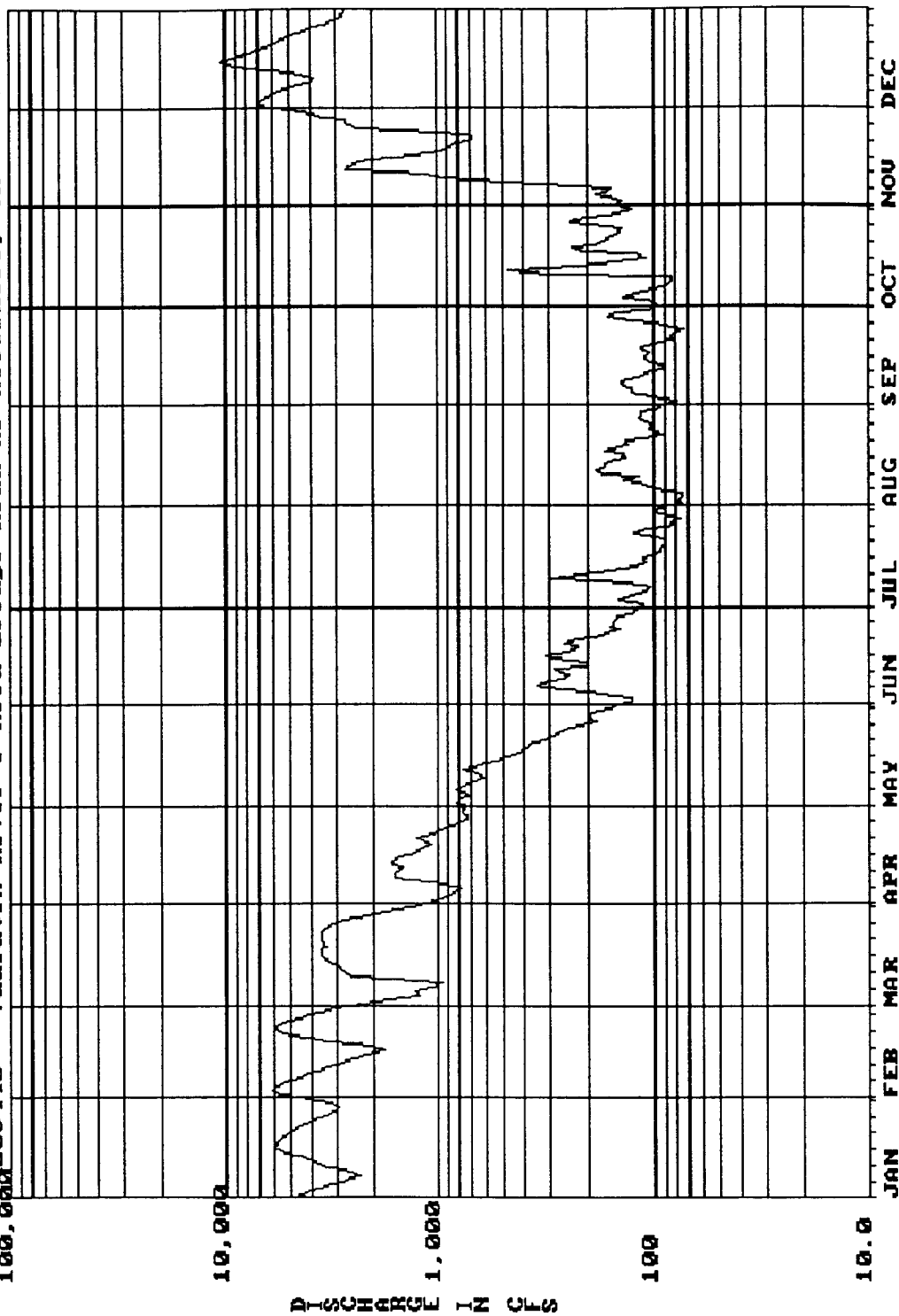
OREGON WATER RESOURCES DEPARTMENT
 14206200 Dairy Creek at Hwy 8 nr Hillsboro, OR
 Latitude: 453112 Longitude: 1230034 River Mile: 2.06

DAILY DISCHARGE IN CUBIC FEET PER SECOND FOR 1995

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1								24	21			
2								21	21			
3								20	21			
4								21	21			
5								22	21			
6												
7								22	23			
8								24	35			
9								26	36			
10								25	32			
11								23	28			
12												
13								29	26			
14								38	23			
15								36	23			
16								31	23			
17								26	22			
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
TOTAL												
MEAN												
MAX												
MIN												
AC-FT												
YEAR 1995												
TOTAL*												
MEAN												
MAX												
MIN												
AC-FT												
YEAR 1995												
TOTAL*												
MEAN												
MAX												
MIN												
AC-FT												

* Incomplete Record Period of Record Max Gage and Discharge on July 15 at 12:30: 2.04' - 48 cfs
 Period of Record Min Gage and Discharge on September 23 at 2230: 1.25 - 15.6 cfs
 Source Agency: Tualatin Basin Watermaster
 Provisional Data: subject to revision

100,000 14206440 Tualatin River @ Road Bridge Road nr Hillsboro, OR 1995



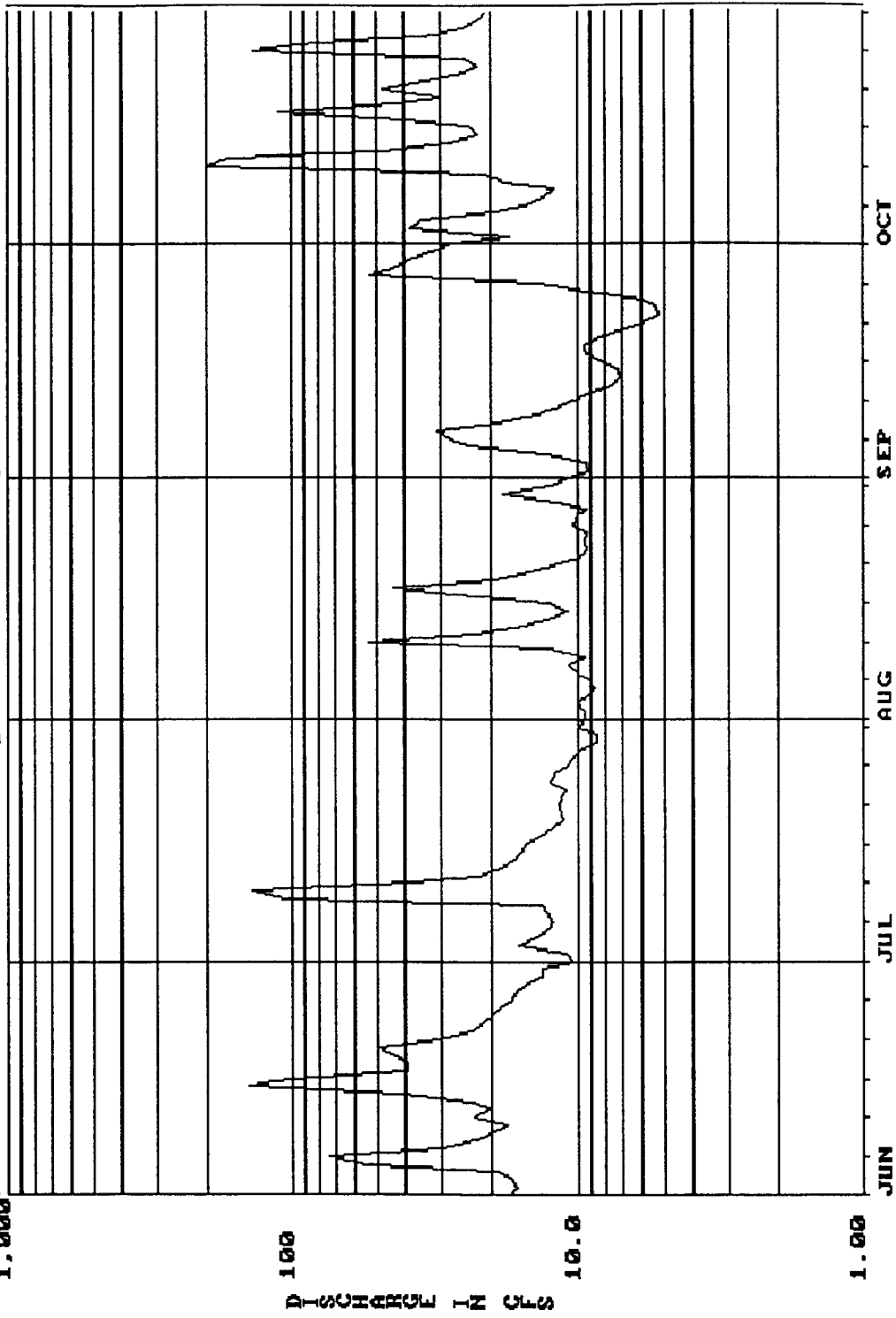
OREGON WATER RESOURCES DEPARTMENT
14206440 Tualatin River @ Rood Bridge Road nr Hillsboro, OR
Latitude: 452925 Longitude: 1225701 River Mile: 38.34

DAILY DISCHARGE IN CUBIC FEET PER SECOND FOR 1995

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	4,900	4,440	2,580	1,150	720	147	116	84	91	96	148	5,950
2	4,400	5,620	1,970	1,030	824	130	114	76	79	98	143	7,130
3	3,990	6,120	1,490	922	815	128	145	77	92	105	150	7,080
4	3,620	5,970	1,240	882	721	153	136	76	115	138	185	6,590
5	3,260	5,560	1,310	816	754	205	119	76	126	120	166	6,120
6	2,900	5,050	1,170	789	827	320	112	98	126	100	158	5,640
7	2,600	4,530	1,010	919	770	349	106	105	140	92	229	5,100
8	2,400	4,100	975	1,360	713	305	114	116	142	86	467	4,550
9	2,600	3,720	1,680	1,620	654	263	174	138	130	85	964	4,110
10	3,290	3,360	2,570	1,640	605	250	297	117	114	85	980	3,820
11	3,610	3,030	2,810	1,560	655	276	219	175	105	299	1,530	4,220
12	3,810	2,730	2,900	1,500	775	294	160	185	92	469	2,710	4,880
13	4,120	2,510	3,000	1,640	686	208	138	174	90	305	2,690	6,280
14	4,630	2,220	3,260	1,670	604	204	114	171	106	177	2,500	8,980
15	5,260	1,800	3,450	1,560	540	296	111	151	111	129	2,120	10,600
16	5,760	1,880	3,540	1,390	478	323	114	135	110	110	1,570	10,100
17	5,950	2,460	3,580	1,240	434	255	106	140	106	123	1,080	8,900
18	5,860	3,350	3,550	1,180	410	232	94	172	115	211	900	7,900
19	5,650	3,980	3,460	1,080	389	230	95	144	107	240	899	7,100
20	5,430	5,070	3,480	1,120	381	262	92	134	95	185	806	6,460
21	5,180	5,800	3,550	1,260	329	225	90	136	82	174	712	6,020
22	4,880	5,910	3,580	1,150	303	189	91	111	84	161	682	5,590
23	4,540	5,610	3,560	1,020	283	165	107	93	83	150	740	5,130
24	4,220	5,120	3,480	923	266	145	124	105	73	146	1,440	4,650
25	3,900	4,560	3,330	848	246	160	109	106	82	141	2,400	4,230
26	3,600	4,070	3,110	777	218	154	87	100	101	193	2,640	3,850
27	3,290	3,610	2,800	739	188	152	84	110	144	245	2,740	3,480
28	3,030	3,130	2,420	742	199	149	77	119	164	205	3,500	3,110
29	3,020	-----	1,980	771	199	128	86	115	150	162	3,830	2,930
30	3,220	-----	1,590	764	182	124	100	116	108	137	4,420	2,850
31	3,750	-----	1,330	-----	160	-----	102	102	-----	126	-----	2,810
TOTAL	126,670	115,310	79,755	34,062	15,328	6,421	3,733	3,757	3,263	5,093	43,499	176,160
MEAN	4,086	4,118	2,573	1,135	494	214	120	121	109	164	1,450	5,683
MAX	5,950	6,120	3,580	1,670	827	349	297	185	164	469	4,420	10,600
MIN	2,400	1,800	975	739	160	124	77	76	73	85	143	2,810
AC-FT	251,200	228,700	158,200	67,560	30,400	12,740	7,400	7,450	6,470	10,100	86,280	349,400
YEAR 1995	TOTAL	613,051	MEAN	1,680	MAX	10,600	MIN	73	AC-FT	1,216,000		

* Incomplete Record Yearly Max Gage Height and Discharge on December 15 at 1500: 33.83'- 10,800 cfs
Yearly Min Gage Height and Discharge on September 24 at 1900: 1.55 - 71 cfs
Source agency: Tualatin Basin Watermaster
Provisional Data: subject to revision

1.000 14206450 Rock Creek at Hwy 8 nr Hillsboro, OR 1995



Rock Creek at Hwy 8 nr Hillsboro, OR

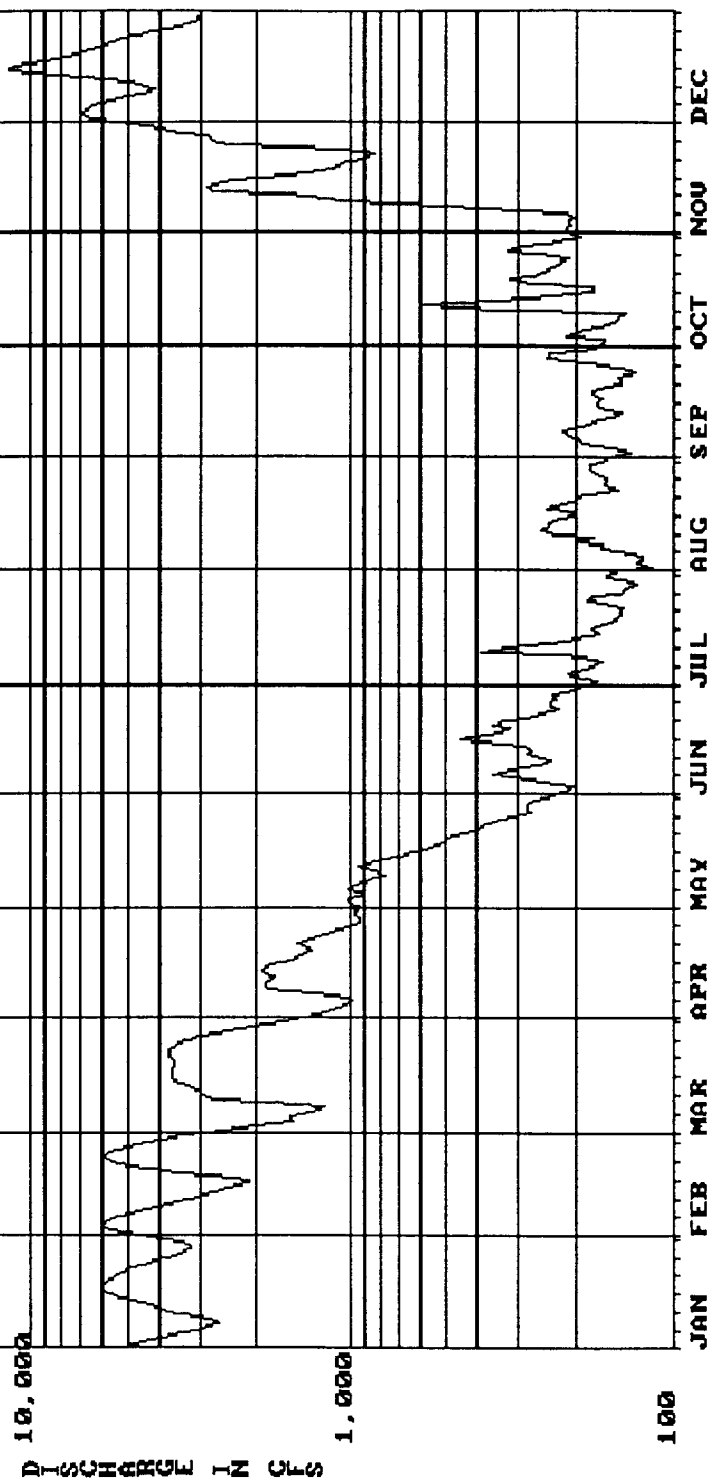
Latitude: 453009 L

DAILY DISCHARGE IN CUBIC FEET PER SECOND FOR 1995

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1						17	10	9.6	11	27		
2						17	11	9.5	9.2	17		
3						17	16	10	9.4	38		
4						19	14	9.3	13	35		
5						55	13	8.9	24	19		
6						74	12	9.2	28	15		
7						30	13	10	31	13		
8						23	14	11	19	12		
9						20	107	9.5	14	18		
10						18	140	13	12	21		
11						23	39	54	10	201		
12						21	23	23	9.0	167		
13						24	19	15	7.7	49		
14						42	17	12	7.2	28		
15						144	16	11	7.4	22		
16						102	15	13	8.4	24		
17						40	14	27	9.5	40		
18						40	12	44	9.6	111		
19						45	11	20	8.5	43		
20						49	12	15	6.9	30		
21						31	12	12	6.0	48		
22						24	11	9.9	5.3	34		
23						22	11	9.5	5.3	25		
24						20	13	9.7	6.0	23		
25						19	12	9.4	9.5	25		
26						17	11	10	14	137		
27						17	11	10	53	82		
28						15	10	9.4	44	34		
29						14	8.6	12	39	25		
30						13	8.7	18	33	22		
31						-----	10	13	-----	21		
TOTAL						1,012	646.3	456.9	469.9	1,406		
MEAN						33.7	20.8	14.7	15.7	45.4		
MAX						144	140	54	53	201		
MIN						13	8.6	8.9	5.3	12		
AC-FT						2,010	1,280	906	932	2,790		
YEAR 1995						TOTAL *	MIN	5.3	AC-FT	7,920		
						201						
						MAX						
						*				*		
						MEAN						
						26.1						
						*				*		
						3,991.1						
						*						
						*				*		

* Incomplete Record Period of Record Max Gage on 10/11: GH 5.19 = 229 cfs
 period of Record Min Gage on 9/22: GH 0.29 = 4.8 cfs
 Source Agency: Tualatin Basin Watermaster
 Provisional Data: subject to revision

100,000 14206500 Tualatin River near Farmington, OR 1995



OREGON WATER RESOURCES DEPARTMENT
14206500 Tualatin River near Farmington, OR

Latitude: 452650 Longitude: 1225658 River Mile: 33.30
Drainage Area: 568 Daily Mean Values

DAILY DISCHARGE IN CUBIC FEET PER SECOND FOR 1995

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	5,240	4,560	2,870	1,420	918	233	181	147	157	167	216	5,400
2	4,780	5,310	2,290	1,280	1,010	215	174	118	136	168	216	6,500
3	4,320	5,950	1,800	1,160	1,030	204	205	131	145	166	208	7,070
4	3,890	6,060	1,530	1,080	925	233	211	125	174	215	212	6,980
5	3,470	5,830	1,560	1,030	926	277	186	125	192	199	202	6,560
6	3,100	5,430	1,440	989	1,020	359	178	148	199	172	217	6,150
7	2,810	4,970	1,260	1,120	972	335	168	168	214	158	297	5,640
8	2,630	4,480	1,210	1,570	904	292	177	169	218	151	500	5,090
9	2,800	4,040	1,840	1,850	843	255	217	202	205	148	1,050	4,560
10	3,490	3,600	2,740	1,890	781	238	389	179	184	142	1,190	4,160
11	3,820	3,240	3,000	1,820	837	254	320	231	171	343	1,620	4,480
12	4,030	2,940	3,080	1,760	952	281	246	258	155	608	2,800	4,990
13	4,350	2,750	3,180	1,880	886	274	213	247	146	458	2,900	5,890
14	4,860	2,490	3,430	1,930	788	287	184	242	165	277	2,760	8,260
15	5,340	2,110	3,630	1,830	706	389	171	225	174	204	2,420	11,800
16	5,740	2,120	3,710	1,660	635	452	180	205	174	178	1,920	11,800
17	6,000	2,760	3,740	1,500	573	375	172	205	169	179	1,400	10,400
18	6,030	3,610	3,720	1,440	544	333	157	248	179	272	1,140	9,020
19	5,890	4,230	3,640	1,340	506	319	152	221	178	321	1,110	7,900
20	5,650	5,010	3,670	1,360	507	360	147	204	161	271	1,020	7,110
21	5,450	5,640	3,760	1,500	447	329	146	200	146	254	904	6,560
22	5,180	5,930	3,790	1,410	413	283	145	184	146	244	857	6,140
23	4,870	5,840	3,760	1,270	391	256	166	148	150	229	890	5,670
24	4,530	5,490	3,680	1,160	368	226	184	165	133	223	1,480	5,180
25	4,170	5,020	3,520	1,080	340	240	180	166	137	213	2,470	4,700
26	3,830	4,500	3,310	988	311	238	147	161	165	263	2,790	4,220
27	3,490	3,970	3,030	940	276	233	142	167	212	323	2,870	3,790
28	3,230	3,410	2,680	938	281	234	131	180	246	300	3,500	3,380
29	3,220	-----	2,260	972	285	211	135	182	242	245	3,980	3,150
30	3,410	-----	1,890	968	269	202	161	182	191	214	4,480	3,060
31	3,970	-----	1,610	-----	245	-----	163	167	-----	194	-----	3,020
TOTAL	133,590	121,290	86,630	41,135	19,889	8,417	5,728	5,700	5,264	7,499	47,619	188,630
MEAN	4,309	4,332	2,795	1,371	642	281	185	184	175	242	1,587	6,085
MAX	6,030	6,060	3,790	1,930	1,030	452	389	258	246	608	4,480	11,800
MIN	2,630	2,110	1,210	938	245	202	131	118	133	142	202	3,020
AC-FT	265,000	240,600	171,800	81,590	39,450	16,700	11,360	11,310	10,440	14,870	94,450	374,100
YEAR 1995	TOTAL	671,391	MEAN	1,839	MAX	11,800	MIN	118	AC-FT	1,332,000		

* Incomplete Record Yearly Max Gage Height and Discharge on December 15 at 1930: 33.21' - 12,200 cfs
Yearly Min Gage Height and Discharge on August 2 at 1100: 3.95 - 104 cfs
Source Agency: Tualatin Basin Watermaster
Provisional Data: subject to revision

03/07/96

UNITED STATES DEPARTMENT OF THE INTERIOR - GEOLOGICAL SURVEY - OREGON DISTRICT

STATION NUMBER 14206950 FANNO CREEK AT DURHAM, OR STREAM SOURCE AGENCY USGS
 LATITUDE 452413 LONGITUDE 1224513 DRAINAGE AREA 31.50 DATUM 116.83 STATE 41 COUNTY 067
 SUBJECT TO REVISION

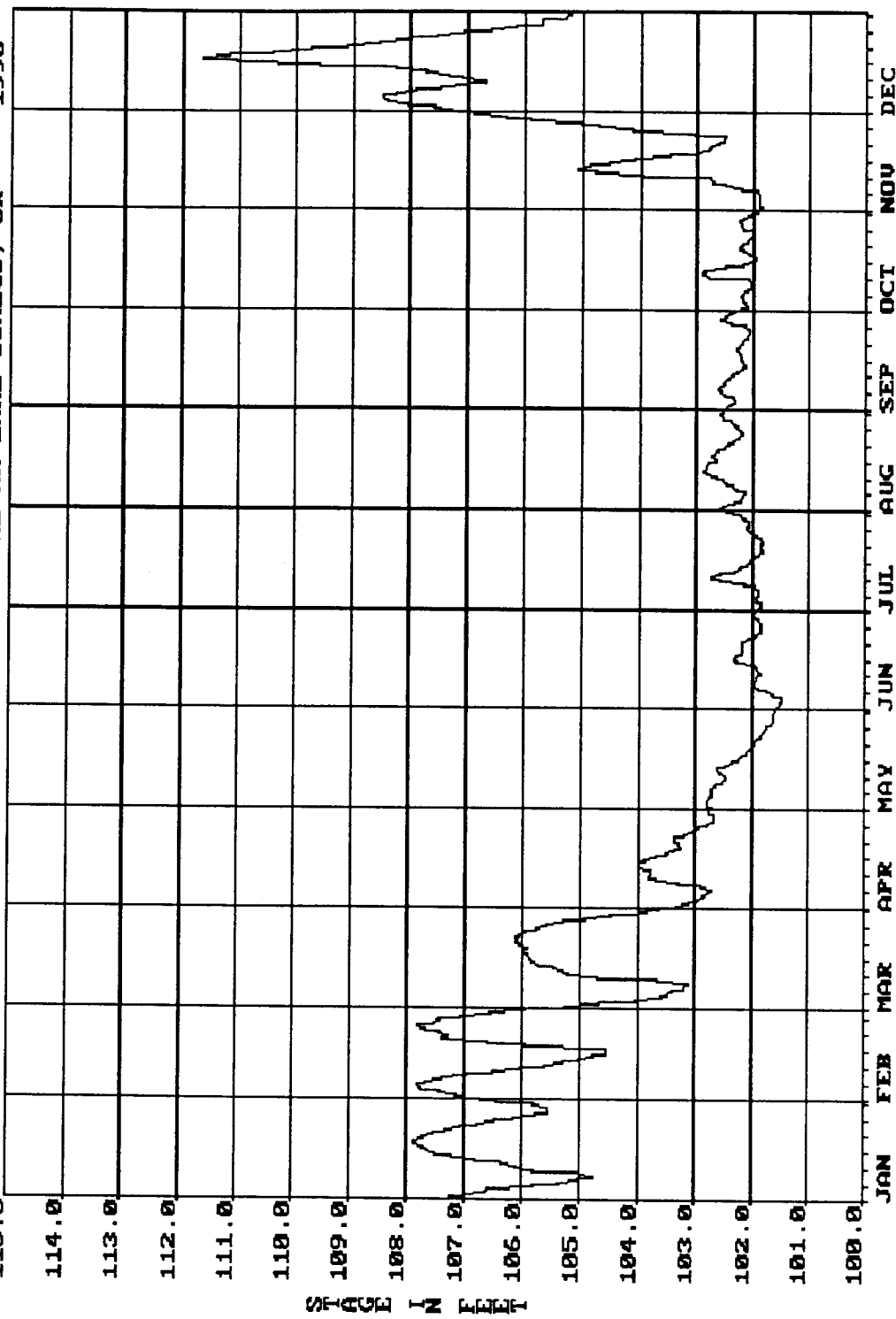
DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY TO DECEMBER 1995
 DAILY MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	37	240	31	28	77	11	8.8	3.4	5.7	12	6.7	256
2	33	146	27	26	80	11	12	3.5	5.1	11	6.0	136
3	30	82	26	25	37	11	16	5.3	6.5	41	5.9	90
4	27	64	62	35	38	12	15	6.0	12	15	7.8	104
5	26	55	61	28	68	54	12	5.7	8.4	9.5	13	59
6	29	46	33	26	38	30	10	6.7	10	10	35	45
7	55	42	28	124	31	18	12	8.7	10	8.7	66	37
8	45	36	82	100	28	13	13	8.4	6.8	12	143	32
9	223	33	206	82	25	12	75	6.5	6.0	12	73	67
10	235	30	141	43	25	15	43	16	5.9	36	e75	181
11	143	30	108	44	59	19	18	22	5.2	267	e700	472
12	194	67	64	72	40	13	13	8.5	4.0	49	243	370
13	288	53	140	110	28	17	11	6.7	3.2	21	154	389
14	315	45	136	54	e22	38	10	6.7	3.3	15	57	377
15	236	132	78	44	e19	112	10	5.9	3.3	12	39	352
16	169	161	59	35	18	30	10	11	3.6	17	33	123
17	108	553	51	38	19	22	9.8	48	3.4	43	30	83
18	115	293	86	43	17	19	9.1	15	4.0	43	38	110
19	83	355	52	40	15	57	8.0	8.2	3.6	13	24	64
20	62	205	173	94	14	31	7.2	6.8	3.4	28	21	54
21	53	103	120	63	14	22	6.9	5.9	3.1	20	30	45
22	45	76	87	36	14	18	6.6	5.3	2.6	16	47	39
23	40	62	59	31	13	15	6.8	4.9	2.7	11	40	34
24	36	51	55	29	13	13	6.8	4.7	3.2	9.8	217	30
25	33	44	42	26	12	12	7.6	4.7	8.0	31	149	27
26	33	39	37	25	12	11	7.3	5.0	15	68	68	25
27	33	37	34	36	11	11	6.6	3.7	45	18	232	24
28	100	33	32	42	10	12	5.4	4.3	43	13	409	37
29	123	---	30	36	10	11	4.7	21	25	11	265	138
30	213	---	28	54	9.4	9.3	4.0	11	29	9.8	273	111
31	359	---	27	---	12	---	4.0	6.9	---	8.1	---	74
TOTAL	3521	3113	2195	1469	828.4	679.3	389.6	286.4	290.0	890.9	3500.4	3985
MEAN	114	111	70.8	49.0	26.7	22.6	12.6	9.24	9.67	28.7	117	129
MAX	359	553	206	124	80	112	75	48	45	267	700	472
MIN	26	30	26	25	9.4	9.3	4.0	3.4	2.6	8.1	5.9	24
AC-FT	6980	6170	4350	2910	1640	1350	773	568	575	1770	6940	7900
CFSM	3.61	3.53	2.25	1.55	.85	.72	.40	.29	.31	.91	3.70	4.08
IN.	4.16	3.68	2.59	1.73	.98	.80	.46	.34	.34	1.05	4.13	4.71

CAL YR 1995 TOTAL 21148.0 MEAN 57.9 MAX 700 MIN 2.6 AC-FT 41950 CFSM 1.84 IN. 24.97

e Estimated

115.0 14206990 TUALATIN RIVER AT OSWEGO CANAL NR LAKE OSWEGO, OR 1995



OREGON WATER RESOURCES DEPRIMENT
14206990 TUALATIN RIVER AT OSWEGO CANAL NR LAKE OSWEGO, OR

Latitude: 452257		Longitude: 1224312					River Mile: 6.70					Daily Mean Elevation				
Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec				
1	107.27	106.99	105.26	103.36	102.75	101.56	101.90	102.60	102.49	102.23	101.87	107.28				
2	107.02	107.16	104.69	103.15	102.81	101.53	101.85	102.55	102.40	102.11	101.90	107.60				
3	106.65	107.45	104.05	102.99	102.82	101.50	101.86	102.32	102.33	102.16	101.90	108.06				
4	106.60	107.77	103.63	102.88	102.76	101.50	101.94	102.23	102.37	102.17	101.89	108.45				
5	105.81	107.86	103.51	102.79	102.73	101.63	101.94	102.17	102.50	102.22	101.91	108.50				
6	105.38	107.71	103.43	102.73	102.75	101.74	101.88	102.15	102.61	102.17	101.93	108.30				
7	105.07	107.39	103.23	102.94	102.75	101.91	101.88	102.29	102.64	102.10	102.22	107.94				
8	104.80	106.97	103.15	103.34	102.67	102.02	101.96	102.38	102.56	102.05	102.52	107.48				
9	105.03	106.51	103.71	103.73	102.57	101.97	102.15	102.47	102.51	102.04	102.74	107.02				
10	105.84	106.06	104.74	103.86	102.47	101.92	102.60	102.56	102.44	102.06	102.78	106.71				
11	106.13	105.63	105.24	103.82	102.49	101.85	102.75	102.67	102.36	102.81	103.99	107.13				
12	106.38	105.32	105.32	103.82	102.58	101.88	102.58	102.84	102.28	102.93	104.80	107.34				
13	106.82	105.07	105.48	104.02	102.62	101.92	102.35	102.89	102.20	102.90	105.08	107.74				
14	107.24	104.79	105.74	104.01	102.49	101.98	102.21	102.85	102.15	102.53	104.90	108.28				
15	107.51	104.59	105.86	103.93	102.37	102.31	102.10	102.81	102.18	102.19	104.59	109.60				
16	107.66	104.56	105.90	103.74	102.27	102.35	102.04	102.67	102.22	102.00	104.12	111.07				
17	107.74	105.96	105.93	103.53	102.17	102.30	101.95	102.73	102.24	101.95	103.51	111.68				
18	107.89	106.60	106.01	103.39	102.10	102.17	101.88	102.70	102.25	102.08	103.04	111.21				
19	107.88	107.04	105.93	103.30	102.05	102.19	101.83	102.63	102.28	102.20	102.83	110.44				
20	107.75	107.28	106.08	103.34	102.02	102.20	101.85	102.53	102.27	102.26	102.76	109.75				
21	107.55	107.46	106.13	103.41	101.97	102.17	101.85	102.45	102.20	102.19	102.63	109.13				
22	107.33	107.70	106.13	103.39	101.93	102.07	101.83	102.38	102.13	102.11	102.57	108.57				
23	107.08	107.84	106.07	103.23	101.87	101.96	101.84	102.27	102.10	102.04	102.50	108.04				
24	106.80	107.57	105.96	103.07	101.83	101.87	101.92	102.20	102.09	101.99	103.06	107.54				
25	106.48	107.46	105.80	102.95	101.79	101.84	102.03	102.22	102.09	101.99	104.18	107.06				
26	106.14	107.07	105.59	102.82	101.74	101.85	102.11	102.30	102.15	102.19	104.75	106.60				
27	105.80	106.55	105.30	102.72	101.68	101.84	102.06	102.34	102.39	102.22	105.06	106.14				
28	105.57	105.97	104.93	102.71	101.64	101.88	102.06	102.41	102.59	102.27	105.92	105.70				
29	105.57	-----	104.49	102.72	101.64	102.02	102.15	102.55	102.51	102.18	106.34	105.50				
30	105.84	-----	104.02	102.77	101.64	101.99	102.22	102.59	102.41	102.05	106.89	105.31				
31	106.45	-----	103.64	-----	101.61	-----	102.37	102.55	-----	101.94	-----	105.23				
MEAN	106.55	106.65	105.00	103.28	102.24	101.93	102.06	102.49	102.33	102.20	103.51	107.95				
MAX	107.89	107.86	106.13	104.02	102.82	102.35	102.75	102.89	102.64	102.93	106.89	111.68				
MIN	104.80	104.56	103.15	102.71	101.61	101.50	101.83	102.15	102.09	101.94	101.87	105.23				

Max: 12/17 @ 0330 - 111.75

Min: 6/4 @ 0400 - 101.47

Source Agency: Tualatin Basin Watermaster
Provisional Data - Subject to Revision

OREGON WATER RESOURCES DEPARTMENT
14207000 OSWEGO CANAL NR LAKE OSWEGO ORE

LAT 45 23 18 LONG 122 43 11 D DA DATUM 96.50 CO CLAC

DAILY DISCHARGE IN CUBIC FEET PER SECOND WATER YEAR OCT 1994 TO SEP 1995

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL ^{27 17}	AUG	SEP
1	47	74	78	51	12	22	50	43	23	28	2.9	58
2	48	65	63	22	11	25	46	45	22	27	42	56
3	48	53	36	7.1	10	26	42	45	21	27	51	51
4	46	45	37	7.3*	10	23	41	43	21	30	48	49
5	42*	37	45	7.3	10	22	39	42	26	29	46	52
6	39	35	50	6.9	9.5	17	38	42	29	27	45	57
7	38	41	50	6.6	9.7	5.7	42	41	35	28	49	60
8	39	43	47	6.4	10	5.9	50	40	39	30	53	61
9	39	45*	46	7.2	10	26	56	43	20	36	56	57
10	39	51	43	7.0	10	62	58	49*	15	55*	59	55
11	39	58	44	6.6	10	70	45*	50	33	57	64	52
12	38	55	47	6.6	12	71	18	54	33	48	71	49
13	38	50	46	7.5	13	74	19	54	35	40	72	45
14	39	45	45	7.5	12	76	18	50	37	36	62	42
15	38	40	45	7.6	15	76	18	46	48	32	56	42
16	38	46	51	6.8	16	76	17	42	50*	31	52*	44
17	46	61	55	6.5	19	67	A 16	39	48	28	55	45
18	50	72	55	6.3	14	30	A 15	37	43	26	54	45
19	45	73	49	6.0	15	30	15	35	44	24	52	46
20	42	71	44	5.8	13	32	16	34	44	25	49	450*
21	42	66	45	5.7	12	22	16	32	42	25	46	430
22	41	58	45	5.6	8.9A	11	16	34	37	24	44	400
23	42	55	45	5.8	4.4A	11	14	34	32	25	41	390
24	43	53	45	6.6	4.5A*	23	13	33	29	27	39	380
25	44	60	44	7.3	4.3A	37	13	31	29	31	46	380
26	51	63	45	7.8	4.1	35	27	30	29	35	48	390
27	79	66	43	8.7	16	56	43	28	28	35	50	470
28	58	62	41	9.3	24	80	43	26	30	36	52	570
29	53	54	50	9.2	-----	73	43	26	33	38	56	550
30	45	64	51	12	-----	65	44	26	32	42	61	520
31	48	-----	52	15	-----	55	-----	25	-----	21	60	-----
TOTAL	1,384	1,661	1,482	289.0	319.4	1,304.6	931	1,199	987	1,003	1,581.9	1,459
MEAN	44.6	55.4	47.8	9.32	11.4	42.1	31.0	38.7	32.9	32.4	51.0	48.6
MAX	79	74	78	51	24	80	58	54	50	57	72	61
MIN	38	35	36	5.6	4.1	5.7	13	25	15	21	2.9	38
AC-FT	2,750	3,290	2,940	573	634	2,590	1,850	2,380	1,960	1,990	3,140	2,890
CAL YEAR 1994 TOTAL		17,928.0	MEAN	49.1	MAX	103	MIN	1.9	AC-FT	35,560		
WTR YEAR 1995 TOTAL		13,600.9	MEAN	37.3	MAX	80	MIN	2.9	AC-FT	26,980		

// prov *//*

A- no GH

D- doubtful GH

* - MMT

STATION NUMBER 14207500 TUALATIN RIVER AT WEST LINN, OREG. STREAM SOURCE AGENCY USGS
LATITUDE 452103 LONGITUDE 1224030 DRAINAGE AREA 706.00 DATUM 85.61 STATE 41 COUNTY 005

PROVISIONAL DATA

SUBJECT TO REVISION

DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY TO DECEMBER 1995

DAILY MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	5840	5450	3450	1610	1100	273	204	141	150	202	197	6090
2	5500	5650	2800	1430	1150	256	191	150	138	175	205	6450
3	5040	5980	2200	1300	1160	239	191	124	129	188	205	7050
4	4530	6360	1820	1210	1120	237	211	112	133	189	201	7590
5	4030	6490	1710	1150	1100	302	212	104	147	200	207	7660
6	3530	6300	1650	1080	1120	369	195	104	160	188	216	7370
7	3200	5860	1490	1240	1110	367	177	117	197	172	319	6880
8	2940	5330	1400	1560	1050	348	167	128	213	161	561	6260
9	3160	4780	1870	1910	986	322	206	137	205	158	962	5680
10	4070	4240	2810	2030	916	298	324	149	192	158	1280	5340
11	4410	3740	3310	2000	926	275	372	163	178	486	2490	5870
12	4720	3390	3390	2000	1000	283	325	188	166	651	3210	6150
13	5290	3150	3560	2190	1030	302	261	210	152	639	3490	6620
14	5850	2880	3840	2170	927	325	223	213	143	456	3260	7380
15	6210	2670	3990	2100	844	469	195	219	147	311	2930	9150
16	6410	2660	4040	1920	769	502	182	214	154	240	2450	11400
17	6490	4140	4070	1730	703	479	187	224	156	222	1870	12300
18	6670	4890	4160	1620	651	415	173	228	158	262	1450	11500
19	6650	5390	4060	1540	609	420	153	234	162	307	1270	10400
20	6450	5700	4250	1580	586	430	145	210	159	336	1210	9380
21	6190	5910	4310	1630	558	415	144	195	149	308	1100	8500
22	5880	6250	4310	1620	503	366	142	185	136	277	1050	7720
23	5550	6450	4240	1480	463	323	143	166	130	252	1010	7000
24	5190	6380	4110	1360	443	281	158	146	127	237	1530	6330
25	4810	5990	3920	1250	416	248	159	133	121	239	2610	5710
26	4400	5430	3680	1150	385	250	148	125	131	309	3170	5150
27	4000	4810	3390	1080	351	245	139	127	178	320	3530	4630
28	3720	4130	3030	1070	324	223	114	132	268	340	4460	4140
29	3720	---	2610	1070	324	208	93	151	279	305	4970	3920
30	4030	---	2190	1110	320	207	98	159	250	254	5600	3710
31	5030	---	1840	---	300	---	110	161	---	219	---	3630
TOTAL	153510	140400	97500	46190	23244	9677	5742	5049	5008	8761	57013	216960
MEAN	4952	5014	3145	1540	750	323	185	163	167	283	1900	6999
MAX	6670	6490	4310	2190	1160	502	372	234	279	651	5600	12300
MIN	2940	2660	1400	1070	300	207	93	104	121	158	197	3630
AC-FT	304500	278500	193400	91620	46100	19190	11390	10010	9930	17380	113100	430300

CAL YR 1995 TOTAL 769054 MEAN 2107 MAX 12300 MIN 93 AC-FT 1525000

Temperature Tables

APPENDIX G

14206450 ROCK CREEK AT HWY 8 NR HILLSBORO, OR

EXTREMES FOR MAY TO OCTOBER 1995
MAX, 28.4 July 19 MIN, 7.2 Oct. 31

Source Agency: Tualatin Basin Watermaster

TEMPERATURE, WATER (DEG. C), MAY TO OCTOBER 1995									
Day	Max	May Min	Mean	Max	June Min	Mean	Max	July Min	Mean
1	14.7	14.2	14.5	19.1	17.4	18.4	22.6	17.8	21.6
2	14.4	13.9	14.2	18.9	17.5	18.3	22.0	20.3	21.0
3	14.4	13.3	14.0	18.5	17.0	17.9	20.3	19.6	19.9
4	14.2	13.7	14.0	18.5	17.4	17.8	20.4	18.1	19.6
5	13.9	13.1	13.4	17.3	15.8	16.4	20.1	17.5	19.6
6	13.2	12.7	13.0	15.8	14.5	15.0	19.7	18.5	19.0
7	13.2	12.6	12.9	16.5	14.2	15.3	19.5	17.8	18.6
8	14.5	12.8	13.6	18.1	15.5	16.8	20.9	18.6	19.7
9	14.3	14.0	14.1	19.4	16.9	18.1	20.9	19.3	20.0
10	14.0	13.5	13.7	19.3	17.2	18.1	19.5	18.8	19.1
11	13.6	12.9	13.3	17.3	15.7	16.6	19.7	18.2	18.9
12	13.7	12.9	13.4	17.0	15.8	16.3	19.8	18.1	19.1
13	14.8	12.8	13.7	16.8	15.5	16.0	19.5	17.8	18.6
14	16.6	14.2	15.3	16.7	15.7	16.1	19.3	15.2	17.6
15	17.7	15.8	16.8	15.9	15.4	15.7	19.5	13.8	17.7
16	17.4	16.1	16.8	15.9	15.6	15.8	21.2	17.5	19.7
17	16.1	14.4	15.1	16.1	15.2	15.6	24.6	19.0	21.2
18	14.7	13.6	14.2	15.9	15.4	15.6	23.3	19.8	22.2
19	15.7	12.7	14.4	15.9	15.0	15.4	28.4	20.9	23.2
20	17.1	14.4	15.7	16.0	15.5	15.7	23.9	20.6	23.2
21	17.8	15.6	16.7	15.9	15.2	15.5	23.4	21.9	22.6
22	18.4	16.4	17.5	17.5	15.1	16.1	21.9	21.0	21.4
23	18.2	16.6	17.5	19.4	16.5	17.7	21.0	20.4	20.6
24	18.3	16.3	17.4	20.4	18.1	19.3	20.7	19.9	20.4
25	18.9	16.8	17.9	20.4	18.1	19.5	21.0	19.3	20.2
26	19.1	16.9	18.2	20.2	15.3	18.9	20.6	19.6	20.0
27	19.0	17.3	18.1	20.6	16.0	19.0	20.9	19.2	20.0
28	19.6	17.0	18.3	20.4	16.0	19.3	21.2	19.8	20.5
29	20.4	18.2	19.4	25.8	17.7	20.2	20.2	18.5	19.1
30	20.2	18.6	19.5	23.4	18.2	21.1	18.9	17.3	18.1
31	19.7	17.7	18.6				19.9	18.2	18.9
Month	20.4	12.6	15.7	25.8	14.2	17.3	28.4	13.8	20.0
Day	Max	August Min	Mean	Max	September Min	Mean	Max	October Min	Mean
1	21.0	19.4	20.1	19.6	18.1	18.8	16.0	15.0	15.4
2	20.7	19.6	20.2	19.3	18.8	19.0	15.5	15.1	15.3
3	20.8	19.4	20.1	19.0	18.2	18.5	15.6	15.4	15.5
4	21.8	20.2	20.9	18.6	17.7	18.1	15.4	15.0	15.2
5	21.6	20.6	21.0	18.3	17.7	18.0	15.0	13.6	14.1
6	20.7	18.9	19.7	18.2	17.1	17.4	14.3	13.7	14.0
7	18.9	18.0	18.3	17.5	16.9	17.2	14.2	13.5	13.8
8	18.7	17.6	18.1	17.8	16.5	17.2	13.8	13.5	13.6
9	19.0	17.4	18.2	18.4	17.2	17.8	13.8	13.3	13.5
10	18.8	18.1	18.6	19.1	17.8	18.4	14.3	13.7	13.9
11	18.9	17.7	18.3	18.8	18.0	18.4	14.3	14.0	14.2
12	18.5	17.5	18.0	18.5	17.4	18.0	14.2	13.1	13.6
13	17.9	16.5	17.2	18.6	17.4	18.0	13.1	12.1	12.5
14	17.8	16.6	17.3	19.1	17.7	18.4	12.6	11.7	12.2
15	18.4	17.8	18.1	19.3	18.3	18.8	13.2	12.0	12.4
16	18.0	17.1	17.5	18.8	18.1	18.3	14.1	13.2	13.5
17	17.1	16.3	16.7	18.2	17.8	18.0	14.0	13.5	13.8
18	17.6	16.3	16.9	17.8	16.8	17.3	13.4	12.3	12.9
19	18.2	16.2	17.2	17.6	16.5	17.0	12.2	11.2	11.6
20	18.9	17.2	18.1	17.8	16.8	17.3	12.2	11.4	11.8
21	19.2	18.2	18.8	17.6	16.8	17.2	12.0	11.6	11.8
22	19.5	18.2	18.9	17.0	15.5	16.3	11.8	11.0	11.2
23	19.1	18.0	18.6	16.3	14.8	15.6	11.4	10.6	11.0
24	18.0	16.7	17.3	16.3	14.8	15.6	11.7	11.2	11.4
25	17.7	16.3	17.0	16.7	15.7	16.2	11.6	11.2	11.4
26	17.3	16.3	16.8	16.3	15.8	16.0	12.5	11.6	12.0
27	17.7	16.4	17.0	16.6	15.8	16.1	12.4	11.9	12.2
28	18.0	17.1	17.5	16.7	16.3	16.5	11.9	10.8	11.1
29	18.2	17.4	17.7	16.4	15.9	16.2	10.8	9.7	10.0
30	18.4	17.1	17.9	16.4	16.0	16.2	9.9	8.6	9.1
31	18.9	17.6	18.3				8.6	7.2	7.6
Month	21.8	16.2	18.3	19.6	14.8	17.4	16.0	7.2	12.6

14206440 TUALATIN RIVER AT ROOD BRIDGE ROAD

EXTREMES FOR MAY TO OCTOBER 1995
MAX, 21.8 July 19 MIN, 8.0 Oct. 31

Source Agency: Tualatin Basin Watermaster

TEMPERATURE, WATER (DEG. C), MAY TO OCTOBER 1995									
Day	Max	May Min	Mean	Max	June Min	Mean	Max	July Min	Mean
1	13.7	11.5	12.8	18.6	16.6	17.7	19.7	18.1	19.0
2	14.5	12.1	13.1	17.7	16.6	17.2	19.2	17.7	18.8
3	13.5	12.0	12.9	17.8	16.0	17.1	18.4	15.7	17.4
4	13.7	11.8	12.8	16.8	14.1	15.8	17.2	15.3	16.4
5	13.1	11.3	12.6	16.0	14.1	15.3	18.1	16.2	17.2
6	12.9	11.2	12.3	15.1	12.8	14.2	17.6	16.1	17.0
7	13.1	11.2	12.3	14.8	12.6	13.8	17.3	15.8	16.7
8	13.4	11.6	12.6	15.5	13.4	14.7	18.3	15.9	17.2
9	13.6	11.8	12.8	17.3	14.5	15.9	18.6	17.0	18.0
10	13.6	11.4	12.8	17.7	13.1	15.9	18.2	16.3	17.6
11	13.0	11.4	12.4	16.3	14.9	15.8	17.9	16.0	17.0
12	13.2	11.8	12.5	15.6	14.1	15.0	18.2	16.3	17.4
13	13.6	11.8	12.7	14.8	13.1	14.3	17.8	16.1	17.2
14	14.5	12.3	13.4	17.2	13.0	14.1	17.6	16.4	17.0
15	15.5	13.4	14.7	15.0	13.2	14.2	18.4	16.3	17.5
16	15.9	14.2	15.4	14.9	13.6	14.3	19.2	16.8	18.1
17	15.2	13.3	14.7	15.7	13.5	14.6	20.2	17.8	19.2
18	14.1	12.6	13.6	15.4	14.0	14.8	21.1	18.9	20.1
19	14.2	12.3	13.3	15.7	13.9	14.8	21.8	19.8	20.8
20	14.6	12.7	13.7	15.6	14.0	14.9	21.0	19.4	20.3
21	16.0	13.4	14.8	15.4	13.9	14.8	20.3	18.9	19.7
22	16.9	14.4	15.7	16.3	13.9	15.2	19.3	17.7	18.8
23	17.0	15.1	16.1	17.7	15.3	16.6	18.2	15.9	17.2
24	17.0	15.3	16.2	19.2	16.7	18.0	16.8	15.5	16.3
25	17.4	15.4	16.4	19.6	17.5	18.8	17.5	15.1	16.4
26	17.4	15.8	16.7	19.1	17.7	18.4	18.2	16.5	17.4
27	17.7	15.5	16.7	19.1	17.6	18.4	18.8	16.8	17.9
28	17.8	15.5	16.8	18.6	17.4	18.0	19.8	17.3	18.5
29	18.3	16.4	17.5	19.3	17.2	18.3	18.8	16.7	18.1
30	19.1	16.9	17.9	19.5	17.8	18.7	17.3	15.6	16.5
31	19.5	17.0	17.9				17.3	15.3	16.4
Month	19.5	11.2	14.4	19.6	12.6	16.0	21.8	15.1	17.8
Day	Max	August Min	Mean	Max	September Min	Mean	Max	October Min	Mean
1	18.8	15.8	17.4	17.6	14.9	16.3	16.4	14.6	15.7
2	19.6	17.2	18.5	17.4	15.6	16.7	16.0	14.3	15.3
3	19.5	17.8	18.7	17.1	15.1	16.4	16.0	14.2	15.3
4	19.8	17.4	18.7	16.3	14.2	15.4	15.6	14.0	15.0
5	20.1	18.1	19.1	15.8	14.0	15.0	15.4	13.6	14.7
6	18.8	15.4	17.6	15.8	14.0	14.7	15.2	13.3	14.4
7	15.8	14.2	15.2	15.5	13.8	14.7	15.0	13.3	14.2
8	15.8	13.9	15.1	16.8	13.9	15.3	14.7	13.1	14.0
9	15.1	13.8	14.6	16.7	14.6	15.7	15.1	12.9	13.8
10	15.1	13.8	14.6	17.4	15.2	16.6	14.8	13.2	14.0
11	14.7	13.1	14.1	17.7	15.8	16.9	16.1	13.2	14.6
12	14.6	12.8	13.9	17.8	15.7	16.8	15.6	13.1	14.3
13	14.3	12.6	13.9	17.9	15.8	17.0	14.7	12.2	13.3
14	14.4	12.4	13.7	17.8	15.9	17.0	14.0	11.6	12.5
15	14.4	13.1	14.0	17.7	15.6	16.9	14.2	11.4	12.5
16	15.0	13.0	14.1	17.3	15.4	16.5	14.7	11.8	13.3
17	14.4	12.8	13.7	17.2	15.3	16.3	14.8	12.4	13.5
18	14.4	12.6	13.7	16.8	14.8	15.9	14.4	12.2	13.1
19	15.3	12.9	14.2	17.0	14.6	16.0	13.4	11.2	12.6
20	15.9	13.6	14.9	17.2	15.2	16.4	13.3	11.0	12.2
21	16.7	14.3	15.4	17.1	15.5	16.5	13.0	10.9	12.0
22	16.9	14.4	15.7	16.7	14.9	16.0	12.7	10.7	11.6
23	16.9	15.0	16.1	15.8	14.2	15.2	12.2	10.5	11.4
24	16.0	14.0	15.3	16.5	14.0	15.2	12.8	10.6	11.7
25	16.0	13.7	15.0	16.4	14.5	15.5	12.7	10.8	11.8
26	16.0	13.8	15.0	16.0	14.7	15.6	13.4	10.8	12.1
27	15.6	13.8	14.8	16.7	14.6	15.7	13.6	11.4	12.7
28	15.7	13.8	14.9	16.8	15.1	16.0	12.4	10.2	11.8
29	16.0	13.7	15.0	16.7	15.2	16.0	11.8	9.9	11.0
30	16.3	14.0	15.3	17.1	15.0	16.2	10.9	9.2	10.2
31	16.9	14.2	15.6				9.6	8.0	8.8
Month	20.1	12.4	15.4	17.9	13.8	16.0	16.4	8.0	13.0