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Arch Cape Domestic Water Supply District Board of Commissioners:

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Staff: Phil Chick, District Manager Randy Cruse, Plant Operator

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Executive Summary

The Arch Cape Domestic Water Supply District is pleased to present its 2015 Water Management and Conservation Plan (WMCP) to the Oregon Water Resources Department (OWRD) and interested parties. This plan is specifically prepared to meet the requirements of Oregon Administrative Rules (OAR) Chapter 690 Division 86. The objective of the plan is to provide a guiding framework for the effective management and conservation of the Arch Cape Domestic Water Supply District's water resources. The Arch Cape Domestic Water Supply District ("the District") believes the details outlined in the following plan provide a comprehensive strategy for ensuring that continual service is provided to meet the present and future water use needs of the residents of Arch Cape, while maintaining a focus on conservation.

The District last submitted a WMCP in 1998. Since that time, the District has made significant progress in servicing its residents and carrying out water conservation measures. Progress made in combining service and conservation needs includes the construction of a 520,000 gallon glass-lined steel reservoir, the installation of new radio-read meters throughout the District, the construction of a new membrane surface water treatment plant, upgrading out-dated sections of distribution piping, and the construction of the Asbury Creek Water Intake. The District also has adopted a rate structure that encourages conservation through a multi-tiered rate schedule, established for customer accounts with excess monthly water consumption. The District Board of Directors and staff share a common commitment to marrying the 2015 WMCP with the needs of the Arch Cape community, in cooperation with the guidance of the Oregon Water Resources Department.

Section 1: WMCP Plan Elements

1.1 Notice to Affected Local Governments OAR 690-086-0140(1)

Thirty days prior to submitting the WMCP to OWRD, notice of availability of the draft plan was provided to all local affected governments. The following are the local public agencies and governments that are affected by the operations of the Arch Cape Domestic Water Supply District:

Arch Cape Sanitary District

The Arch Cape Sanitary District provides sanitary service to all of the homes in Arch Cape. An Intergovernmental Agreement exists between the District and the Arch Cape Sanitary District.

Clatsop County Planning Department

The Land Use Planning Division reviews and issues permits for land use development throughout rural Clatsop County.

Cannon View Park, Inc.

Cannon View Park is a subdivision within Arch Cape that has an independent spring-fed water system. A temporary emergency supply agreement exists between the two water providers, in the event of a water emergency.

Cannon Beach Rural Fire Protection District

The Cannon Beach Fire Department provides fire protection to all properties in Arch Cape, and utilizes the fire hydrants and water supply of the District.

Oregon Department of Transportation

ODOT operates and maintains Highway 101, the Oregon Coast Highway, which bisects Arch Cape.

Oregon Department of Fish and Wildlife

ODFW is responsible for the protection and management of fish habitat on both streams which supply water to the District.

1.2 Proposed WMCP Update Schedule

OAR 690-086-0126(6)

The District intends to submit a progress report to OWRD every five years, to review benchmarks and progress on proposed water use and conservation measures. The District proposes submitting an updated WMCP in January 2025.

Section 2: Water Supplier Description

This section is written to satisfy the requirements of OAR 690-086-0140. It serves to provide a close understanding of the District's water sources, service area, population served, existing water rights, and demands for water. This section also examines the adequacy and reliability of the District's existing water supply. The District's customers and their water use patterns are described; as well as the water system, interconnections with other water suppliers, and a quantification of system leakage.

2.1 Supplier's Sources OAR 690-086-0140(1)

Presently, two sources provide water to the District: Shark Creek and Asbury Creek. Shark and Asbury Creeks are fed by a combination of springs and smaller spring-fed tributaries within the 1250 acre drinking water shed. The majority of this land is owned by private timber companies. Both creeks generally provide high quality water, however, in recent years a high volume of silt has accumulated in the Shark Creek impoundment. It is suspected that recent timber harvesting activities in the upper Shark Creek Basin have caused the increased deposition of sediment.

The point of diversion location for Shark Creek is: NW ¹/₄ SE ¹/₄, Section 19, T4N, R10W,W.M.; 250 feet South and 800 feet East from the C ¹/₄ Corner of Section 19. The point of diversion for Asbury Creek is: SE 1/4 SW 1/4, Section 19, T4N, R10W, W.M.; 865 feet North and 1290 feet West from the S ¹/₄ Corner of Section 19. The Shark Creek Intake was constructed in 1960 and consists of a submerged, screened concrete structure that collects and conveys water by gravity to the filter plant through a 6-inch PVC pipeline. The intake has been maintained and is in good working order, with complete replacement of the transmission line to the filtration plant occurring in 2010. The intake structure is within the surface impoundment formerly used as the water system reservoir. The impoundment is created by a concrete dam across Shark Creek. During the dry season, water in the impoundment is measured by installing a V-notched weir. The District uses the weir to monitor the flow in Shark Creek for compliance with the flow requirements of the water right.

The Asbury Creek intake was constructed in 1999 and consists of a screened concrete intake structure connected by an 8-inch diameter pipe to a concrete wet well. The wet well is approximately 18 feet deep, and contains two multi-stage submersible pumps. The pumps are operated by a control panel located in the control building adjacent to the wet well. The control panel receives a signal from the filter plant when demand for water calls for water from the pump station. Float switches in the wet well provide level indication to the control panel.

The primary source of Arch Cape drinking water is Shark Creek. Arch Cape holds water right Certificate No. 27506/Permit No. 22996 which authorizes Arch Cape to divert 0.05 cubic feet per second from Shark Creek. This permit was issued to provide domestic water service for 30 homes in 1954 and was not updated until additional water rights applications were made in 1992. In November of 1992, the District applied for water rights for 0.07 cubic feet per second and in January 1993 for an additional 0.05 cubic feet per second. This additional water would be for Quasi-Municipal use for up to 430 hookups for residences and businesses within the service area on Shark Creek. The 1992 application was approved June 4, 1996 (Permit No. 52408).

In April 1993, the District also applied for water rights on Asbury Creek for 0.3 cubic feet per second. This is for Quasi-Municipal use for up to 430 hookups for residences and businesses within the service area of the Arch Cape Domestic Water Supply District. The

Water Resources Department granted this water right on June 4, 1996 (Permit No. 52409) for quasi-municipal use.

On August 2, 1998, the District received new permits for both Shark Creek (Application S73005, Permit 53491) and Asbury Creek (Application S-73332, Permit 53492). Permits 53408 and 53409, dated June 5, 1996 are no longer in force or effective, and are superseded by Permits 53491, Shark Creek and 53492, Asbury Creek. Asbury Creek is the District's priority water source during low flow periods. Copies of the Shark and Asbury Creek Permits are included in Appendix A.

The District owns the land where the dam and treatment facilities are located on Shark Creek. The land that is between District property and Asbury Creek is owned by Lynscot Ventures and Kent Price. An easement was obtained from Mr. Kent Price and Mrs. Florence M. Price as part of the additional water right on Asbury Creek (Book 896, Page 720, Records of Clatsop County, Oregon). Zoning is under the jurisdiction of Clatsop County. The zoning in the watershed and at the headworks, reservoir, and treatment facility is F-80, Forests Lands. These facilities are conditional uses in this zone. The land is used for forest practices adjoining the District owned property.

The area is covered by the Clatsop County Comprehensive Plan. The Southwest Coastal Community Plan applies. The area is designated as a Rural Service Area. The District will comply with conditions under Permits 53491 and 53492, dated October 21, 1998, and OAR 690-86-140(A) which allow the District to draw water from Shark and Asbury Creeks.

2.2 Current Service Area and Population Served OAR 690-086-0140(2)

The unincorporated community of Arch Cape primarily occupies the low, relatively flat area between the ocean and the edge of the Coast Range mountains. The low area is approximately 1,000 feet wide in the Arch Cape area and the mountains rise quickly to the east beyond this point. A map of the current service area is provided in Appendix B

There are currently 280 water service connections served by the District. The population estimate varies dramatically, depending on seasonal factors. The community has an estimated full time population of 150 people; however, this number escalates in the summer months. Population estimates were provided by examining voter registration records and consulting with the Clatsop County Planning Department. Peak population numbers for Arch Cape were extrapolated from laboratory results and data routinely tracked at the Arch Cape Wastewater Treatment Facility. DEQ formulas were used for correlating population estimates to daily Plant loading rates. It is estimated that Arch Cape's summer population may increase to 900 persons.

2.3 Assessment of Adequacy and Reliability of Existing Water Supplies OAR 690-086-0140(3)

The District currently holds water rights on two streams that flow through Arch Cape. Both creeks have historically provided high quality water. However, in recent years, it is suspected that logging activity within the water shed has contributed to high turbidity events in the streams and high volumes of silt accumulation in the Shark Creek impoundment. In addition to turbidity concerns, the water supply is also vulnerable to the affects of chemical spray applications, as a result of current forest management practices.

To date, the water right on Shark Creek has been put to full beneficial use. Shark Creek Permit 53491 allows diversion of .12 cfs, contingent upon the maintenance of a minimum flow of .60 cfs in Shark Creek immediately downstream from the point of diversion. At such time when stream flows recede to this level, the District may only divert .05 cfs until stream flows rise back up above .60 cfs. Generally, the District exclusively diverts water from Shark Creek from late September until early summer, when in-stream flow requirements and seasonal limitations prevent meeting community water demand.

For this reason, the District developed a second water intake on Asbury Creek in 1999, Permit 53492. The Asbury Creek intake provides or supplements the community's water needs during the driest months of the year. The Asbury Creek Permit allows diversion of .30 cfs, of which presently .145 cfs is developed and .155 cfs undeveloped. The Permit has a requirement for the maintenance of .10 cfs stream flow in Asbury Creek below the point of diversion.

As of the preparation of this plan, the ability of the two water sources to meet District demand is understood to be adequate. However, certain environmental factors raise questions about the future reliability of the sources. Two prominent concerns involve fish persistence study recommendations by the Oregon Department of Fish and Wildlife, and the vulnerability of the watershed to chemical contamination from current timber land management practices. These factors are addressed in section 2.5 of this plan.

Arch Cape Domestic Water Supply District Minimum Available Stream Flow Supply

The following table provides a summary of District production capacity during low-flow stream conditions:

	Minimum Available Stream Flow Supply
SOURCE	(Gallons per Day)
Shark Creek	
.60 cfs is required to be maintained below	32,143
the point of diversion	
Asbury Creek	93,709 developed portion
.10 cfs is required to be maintained below	
the point of diversion	100,172 undeveloped portion

2.4 Present and Historic Water Use

OAR 690-086-0140(4)

Planning for the District's future water demands is based on examining consumption statistics retrieved from water plant metering records. The following table provided below examines the District's water consumption demand for the previous five years.

<u>Annual Use:</u> Expressed in gallons, is the total amount of water sent out to the distribution system, taken directly from master meter records.

<u>Average Daily Demand:</u> Expressed in gallons per day. Average Daily Demand = Annual Use divided by 365

Max. Month Demand: Expressed in gallons, is the highest water consumption month for a year

<u>Average Day Max. Month Demand:</u> Expressed in gallons per day, is the average daily use within the highest usage month for a year

<u>Peak Day Demand:</u> Expressed in gallons per day, is the highest daily usage recorded for a single day within a year.

YEAR	Annual Use (gal)	Average Daily Demand	Max. Month Demand	Average Day Max. Month Demand	Peak Day Demand
	(801)	(gal/day)	(gal)	(gal/day)	(gui uuy)
2010	8,880,777	24,330	1,076,000	34,710	80,000
			August		July 5 th
2011 *	11,718,226	32,105	1,976,802	63,767	88,767
			July		July 4 th
2012 **	9,672,015	26,499	1,398,565	45,115	67,662
			August		Sept. 2 nd
2013	9,062,360	24,828	1,393,079	44,938	68,399
			July		July 5 th
2014	10,351,431	28,360	1,471,667	47,473	78,450
			August		July 5 th
Average	9,936,961	27,224	1,463,222	47,200	76,643
Maximum	11,718,000	32,105	1,976,802	63,767	88,767

Arch	Cane	Water	Domestic	Water	Supply	District	Current	Water	Use	Statistics
AICH	Cape	vv alti	Domestic	vv alti	Suppry	DISTICT	Current	vv atti	USC	Statistics

* Actual Peak Day 2011 was 140,000 on June 27th due to a water line break. ** Actual Peak Day 2012 was 84,779 on May 7th due to a water service leak

2.5 Water Rights Inventory Table and Environmental Resources Issues OAR 690-086-0140(5)

Appendix C provides a summary of water rights held by the Arch Cape Water District, including historical water diversion data. A brief explanation of environmental resource issues is also explained in this plan, and should be considered as potentially impactful to future water supply needs.

Asbury Creek is currently the subject of a fish persistence study by the Oregon Department of Fish and Wildlife. Upon completion of the study, and recommendations by ODFW, restrictions to the undeveloped portion of the water right may be imposed for the purpose of developing fish habitat. This action has the potential to affect the District's ability to serve the future water needs of the community. A 1998 letter from Walt Weber of the Oregon Department of Fish and Wildlife, written to the Oregon Water Resources Department, declares that the minimum stream flow of .10 cfs is adequate for fish persistence below the Asbury Intake (see Appendix D). It is the hope of the District that these earlier findings will supersede any future curtailment measure recommendations concerning the water intake.

Another concern involves the threat of chemical contamination of the water source. The District's drinking water shed is comprised of approximately 1250 acres, of which 969 are owned by a private timber company. Chemical application is a preferred method of land management within the timber industry. The practice has raised concerns among water users in the area. The District's Source Water Assessment Report identifies forest management practices, including chemical application, as a potential high risk to the drinking water source.

The District will be working with Stimson Lumber Company in the future to attempt to create a Mutual Order of Understanding, with the goal of establishing the best possible outcomes for the mutual interests of the District and Stimson Lumber Company. There exists considerable interest among various groups for purchasing timber lands, in order to maintain drinking water protection. The possibility of the District purchasing the watershed has been discussed in the past. The appeal of this option is the control that owning the watershed would afford the District, concerning the water quality that enters the treatment plant.

2.6 Customers Served and Water Use Summary OAR 690-086-0140(6)

Arch Cape is a residential community. There are 280 water service connections within the District. There are no parks, irrigated areas, drinking fountains, public restrooms, or swimming pools.

There are three tourist Inns in town, and one retail business. The retail business is located on the West side of Highway 101, midway through Arch Cape. The property owner is in

the planning stages of developing the current variety shop into a larger commercial operation. Plans for a restaurant, surf shop, and office spaces are being developed for the property. The current ³/₄" meter connection serving the property will be undersized for this kind of demand. There is the possibility for the need to supply the property with a large meter, to accommodate water use needs. The owner is planning on implementing some form of water re-use for the development. As of the time of this plan's writing, a re-use tank is hoped to be used to supply water for vehicle washing and similar activities.

The customer base of Arch Cape is rather unique in regard to water usage. Historically, Arch Cape has been a second-home community. The majority of homes are used on weekends, holidays, and in the summer. During the winter months, many homes are unused for extended periods. The bulk of the water demand in Arch Cape occurs in the summer and on busy holiday weekends throughout the year.



Customer Classes and Usage:

Institutional Use 2010-2014:

YEAR	Avg. Month Gallons	Peak Month Gallons	Annual Use
2010	6,485	17,260	77,820
2011	8,392	20,650	100,710
2012	8,935	55,400 (leak)	107,230
2013	3,280	6,250	39,370
2014	3,721	5,970	44,660

FIRE STATION:

CHURCH:

YEAR	Avg. Month Gallons	Peak Month Gallons	Annual Use
2010	Not Metered	" "	"
2011	Not Metered	" "	" "
2012	Meter installed Aug.	1,100	2,860
2013	214	1,670	2,570
2014	277	1,850	3,320

YEAR	Connections	Ave. Month Gallons	Peak Month Gallons	Annual Use Gallons					
2010	4	50,905	91,380	610,870					
2011	4	48,421	84,160	581,060					
2012	4	42,856	69,210	514,280					
2013	4	42,756	100,980	513,070					
2014	4	35,455	67,970	425,470					

Commercial Use 2010-2014:

Residential Use 2010-2014:

YEAR	Connections	Ave. Month Gallons	Peak Month Gallons	Annual Use Gallons
2010	272	616,331	1,246240	7,395,980
2011	272	614,313	1,145,840	7,371,760
2012	272	669,029	1,151,330	8,028,350
2013	273	649,368	1,278,360	7,792,420
2014	274	685,055	1,261,500	8,220,670





2.7 Interconnections with Other Systems

OAR 690-086-0140(7)

The District currently is not inter-tied to any other water systems.

In the event of an emergency, it is possible to temporarily connect to Cannon View Park's water system. Cannon View Park has two 75,000 gallon concrete storage tanks to serve 50 homes in the small subdivision on the north end of Arch Cape. It is a spring-fed system. During the summer, these springs produce approximately 7 gpm. An arrangement is in place for Cannon View Park to supply the District with water only in the event of a major, substantial disruption of the water supply system. The agreement is reciprocated, and was upheld by the District in the early 2000's. In the event of an intertie where Cannon View Park was supplying water to Arch Cape, curtailment would be required to maintain an adequate supply of water. A copy of the agreement with Cannon View Park is included in Appendix E.

2.8 System Schematic (See Appendix B) OAR 690-086-0140(8)

2.9 *Quantification of System Leakage* OAR 690-086-0140(9)

The difference between production and sales is known as "*non-revenue water*". Unaccounted for water over the past 5 years has averaged just below 18 per cent. This number is computed by taking the difference between master meter production numbers and recorded use from the District's billing accounts. Non-revenue water includes water used for beneficial purposes such as the flushing of water mains, fire fighting use, and authorized withdrawals from fire hydrants at construction sites. It may also include some unauthorized uses, leakage, and other losses. The District will continue to annually compare its production and sales quantities to maintain a clear picture of system leakage problems.

(on the sense state (guilding)								
	2010	2011	2012	2013	2014			
Production	9,156,321	11,714,015	9,771,592	9,062,360	10,413,360			
Billed Sales	7,511,160	8,053,530	8,652,720	8,080,387	8,694,120			
Non-								
Revenue	1,645,161	3,660,485	1,118,872	981,973	1,719,240			
Water								
% Total								
Production	18%	31%	11%	11%	17%			

Non-Revenue Water (gallons)

Section 3: Water Conservation Element

The following section is written to satisfy the requirements of OAR 690-086-0150. It provides a status report on conservation measures implemented in the District's 1998 WMCP. The District's current water conservation program is discussed, and benchmarks for meeting required conservation measures are also identified.

Conservation Benchmarks

OAR 690-086-0150 (4) requires that all water suppliers establish five year benchmarks for implementing the following water management and conservation measures:

- Annual Water Audit
- System-wide Metering
- Meter Testing and Maintenance
- Water Rate Structure
- Leak Detection and Repair
- Public Education

3.1 Water Use Measuring and Reporting Program OAR 690-086-0150(2)

An Annual Water Use Report for each water right is submitted to the Oregon Water Resources Department by December 31st each year using the "Flow Meter Method" approved by OWRD under OAR 690-085-0015 (5). Flow meter readings, which record cumulative flow, are taken daily at the plant to compile flow data.

3.2 Currently Implemented Conservation Measures

OAR 690-086-0150(3)

The District has also undertaken several additional measures that were not identified in its 1998 WMCP, including:

- The installation of AMR meters throughout the District
- The establishment of an irrigation system policy, requiring residents with irrigation systems to annually verify the proper operation of their systems.
- o The installation of low flow toilets and fixtures at the wastewater treatment plant

3.3 Annual Water Audit

OAR 690-086-0150(4)(a)

Over the past five years the District's annual water loss has been just under 18 per cent. However, this figure has not taken into account water used during routine main flushing or water used for operational uses at the wastewater and water treatment plants. The water audit from 2014 reveals water loss at 17 per cent (See Table, page 13)

Five Year Benchmark:

The District will install meters at the water and wastewater treatment plants to track usage at the facilities. The District will develop and implement a program to track nonrevenue water usage for activities such as main flushing. The District will work with the local fire and public works departments to better measure authorized uses by the agencies. Non-revenue usage will be factored into all future auditing reports starting in 2016.

3.4 Full Metering of System OAR 690-086-0150(4)(b)

All customer accounts within the District are metered and are read by staff monthly. Currently, there are no water meters at the Water and Wastewater Treatment Plants. Although these accounts are not billed, it may be useful to install meters at these locations to better track the amount of water that is used for daily operations including plant wash downs, laboratory work, and possible leaks.

Five Year Benchmark:

The District will install meters at the Wastewater and Water Treatment Plants to track usage at the facilities.

3.5 Meter Testing and Maintenance Program

OAR 690-086-0150(4)(c)

The Water Treatment Plant has three Siemens flow meters that record daily flow data which is incorporated into the District's annual reports. The meters were installed with the plant in 2010. They have not been calibrated since installation.

Service meters were installed in the District in 1986. Since that time, the District meter testing program initiated the replacement of a meter if it reached one million gallons, or did not test accurately. In 2009-2010 all meters within the District were replaced with AMR units. These units were not tested until 2015. The District replaces meters when one million gallons are registered, or if the meter does not measure accurately. Staff will

test 10% of District meters annually, as part of its meter testing and maintenance program.

Five Year Benchmark:

The District will annually test 10% of its customer meters, as part of its meter testing and maintenance program. The District proposes testing its flow meters every five years.

3.6 Rate Structure Based on Quantity of Water Metered

OAR 690-086-0150 (4)(d)

The present rate structure for the District was established by Board Resolution in 2012. All customer accounts are metered and billed a quarterly base rate, depending on meter size. The base rate includes monthly water usage for up to 5,000 gallons. In order to encourage conservation, water use above 5,000 gallons is separated into different billing tiers, which are discussed in section 3.14 of this plan. A breakdown of the current rate structure is provided below:

3/4 inch service connection:	1 inch service connection:
Monthly Base Rate: \$41	Monthly Base Rate: \$47
Water Quarterly Debt Surcharge: \$47	Water Quarterly Debt Surcharge: \$47
Quarterly Base Rate: \$170	Quarterly Base Rate: \$188

Five Year Benchmark:

The District will continue to maintain a rate structure that is based on a volumetric charge associated with the amount of water metered at the customer's service connection. Additionally, every 5 years, the District will review its rate structure to ensure that rates fully reflect the cost of treating and delivering water to its customers.

3.7 Leak Detection Program

OAR690-086-0150(4)(e)

The District's small size makes a staff monitored leak detection program possible. Staff reads water meters monthly, and has a close historical understanding of customer accounts in the small community served by the District. When meter readings are registered that seem out of the norm with historical customer account information, a staff member investigates the possibility of a leak and makes a courtesy call to the homeowner. A color coded system that identifies the highest monthly usages and billing tiers was developed by the District's administrative assistant to aid staff in the process of reviewing monthly usage data for any leaks or anomalies that turn up in the current meter reading period.

The AMR system installed throughout the District in 2010 is the most useful tool in the District's leak detection program. The system is especially effective during freeze events

during the winter. A software program that is linked to the meters can also identify the time in which customer usage events occurred. This historical tracking feature is used to identify and explain high usage patterns, and is a courtesy service provided to customers. The majority of the District's customers are conservation minded as well, and have often proactively identified leaks to District staff in the past.

The Treatment plant SCADA system is monitored regularly by staff and is equipped with an auto-dialer to alert staff in the event of high flow or low reservoir situations. Daily data is trended, including peak and total flows, and any leakage indications are promptly investigated.

The District upgraded 7,000 feet of old, leaking asbestos-concrete pipe in 2010. Leak and main break occurrences have drastically decreased since this project was completed.

Five Year Benchmark: The District will continue to uphold its current Leak Detection practices in the future.



3.8 Public Education Program OAR 690-086-0150(4)(f)

The District has routinely kept its customers informed about conservation measures in the past. The following public education measures are planned to be part of the District's Water Management and Conservation Plan.

- The District will annually submit a water conservation press release in the community's quarterly newsletter publication, *The Tunnel Echoes*.
- The annual Water Quality Consumer Confidence Report will have a section relating to water conservation, providing tips for conserving water indoors and methods for low-use outdoor irrigation. This information will be available on the Arch Cape website.
- Customers with irrigation systems will be sent a reminder in the mail to have their systems checked and maintained by May 1st each year.
- The District will continue free leak detection services for customers, utilizing the AMR system and conducting re-reads of meters when anomalies occur.
- The District will post water conservation material at kiosks and areas in the District frequented by the public.

Five Year Benchmark:

The District will continue its public education program in order to help its customers understand the finite value of the resource and have the knowledge to instill conservation measures within their own homes.

Section 4: Water Curtailment Element

The following section is written to satisfy the requirements of OAR 690-086-0170. It provides a description of past supply deficiencies within the District. A detailed outline of curtailment measures is explained. The triggers for each stage of alert, as well as the necessary actions required of staff, are also included. The District will follow this section of the Plan in the event of a short term water supply emergency.

4.1 Water Supply Assessment and Description of Past Deficiencies OAR 690-086-0160(1)

The District has not faced water shortage issues since developing the Asbury Creek Intake in 1999, and has not had to implement water curtailment restrictions due to a limited water source supply within the last 10 years. The summer of 2015 brought drought conditions across the state, impacting areas on the coast, as well. The District reached out to its customers in July of 2015 and asked that customers practice voluntary conservation measures in preparation of entering into a water curtailment situation. Rains finally came in late August that prevented any sort of action levels of alert to be taken by the District. The dry summer served to be a reminder of the crucial role that water conservation plays in determining the course for the District's future management and operational plans.

The District is awaiting the recommendation of the Oregon Department of Fish and Wildlife, concerning ODFW's opinion regarding stream flows necessary for fish persistence on Asbury Creek. ODFW's recommendation to the Oregon Water Resources Department has the potential to have a limiting effect on the District's supply capacity in the future. The Asbury Creek source is essential in providing the present and future water needs of the District. Any future supply deficiencies that the District will experience, will likely be attributed to measures implemented as a result of the fish persistence findings.

4.2 Stages of Alert OAR 690-086-0160(2)

The following stages of alert will be used to identify various levels of water shortage events within the District. Each stage of alert, including their associated trigger and action measures are described in the tables below.

- Level 1 Mild Alert. Establish awareness of a potential water supply shortage.
- Level 2 Medium Alert. Water Supply Shortage.
- Level 3 High Alert. Severe Water Supply Shortage
- Level 4 Critical Water Supply Emergency

WATER CURTAILMENT PLAN

STAGE	TRIGGER	CURTAILMENT ACTIONS			
Level 1	Asbury Creek natural stream flow drops to .40 cfs Or Water usage reaches 80% of production capacity for 5 consecutive days	"Prep Work" Establish community awareness and encourage voluntary conservation measures. Post signs at mail box kiosk, community store, etc. Distribute email to community email list and post notice on Arch Cape website. Focus: Conservation education Flush water mains for essential needs only			
Level 2	Asbury Creek natural stream flow drops to .30 cfs Or Water usage reaches 90% of production capacity three consecutive days	Continue with Mild alert Actions. Place outdoor watering on odd/even schedule in early mornings and at night. No use of water to wash down the WWTP or WTP structures.			
Level 3	Asbury Creek natural stream flow drops to .25 cfs. Or Water use reaches 95% of production capacity for three consecutive days Or Severe drought is declared	No use of District supplied water for car washing or irrigation *New lawn, grass, or turf that has been seeded or sodded after March 1st of the calendar year in which restrictions are imposed, may be watered until vegetation is established between the times of 8am to 8pm. Activate Reverse 911 call to notify customers.			
Level 4	Asbury Creek natural stream flow drops to .10 cfs Or Tank level is reduced to three day average supply, plus one fire flow event: 13' level in Summer 10' level in Winter Or Natural disaster that incapacitates water system or source	Continue with Level 3 Alert Actions. All Outdoor Use Prohibited. Violators may be cited and service discontinued for repeat violations.			

STAFF RESPONSIBILITIES:

The following staff will have responsibilities for the following tasks in the event that the curtailment plan is required to be deployed:

District Manager:

Advises the Water District Board President of curtailment measures to be implemented. Responsible for all direct and indirect customer and media outreach efforts.

Plant Operator:

Responsible for assisting the District Manager in implementing the curtailment plan, including: coordinating with residential and commercial water users to reduce consumption and ensure that water use activities are commensurate with the curtailment plan.

Administrative Assistant: Responsible for distributing notifications of curtailment to customers through email and the website.

Clatsop County Emergency Management Department: Will send "reverse 911" phone message to customers for Level 3 and 4 curtailment.

Clatsop Co. Sherriff's Department: If necessary, responsible for issuing citations if situations arise where public interference with utility service occurs.

Section 5: Water Supply Element

The water supply element of this Water Management and Conservation Plan is included to provide an overview of the ability of the District to meet future demands. This section includes population and demand projections and evaluates the adequacy of the existing water supply and need for alternative resources.

5.1 Future Service Area and Population Projections OAR690-086-0170(1)

The current service boundaries are shown on the system schematic plate bound herein and was originally estimated to permit development of up to 750 connections. The District is a Rural Service Area contained within the Clatsop County Comprehensive plan. Currently the County has limited growth within the District to a maximum of 430 single family residential units. Similar to a municipal urban growth boundary, boundary expansions or density increases are anticipated in the future as a matter of necessity as the service population increases. The rate of population growth can easily be defined by the Clatsop County projections completed in recent years. The County has quantified an average growth rate of 0.4% county-wide from 2000 to 2010. Cities within the County experienced a growth rate in excess of 0.7% whereas the rural area experienced a reduction of 0.2% per year, which can be attributed to annexation to the cities. Due to the defined service district boundaries, the Arch Cape Water District is most likely similar to the growth within Cities within the County and anticipated to follow the county-wide projections of 0.7% per year.

Although the growth rate can be reasonably defined, the actual number of residents and future population projections are very difficult due to the seasonal fluctuations, as noted in the Current Service Area discussion. Currently, the number of full time residents is estimated at 150 but can swell to 900 seasonally. As a result, quantifying per capita demands and projecting population is not a reasonable exercise.

Alternatively, the number and size of each connection is well known and provides a very accurate accounting of Equivalent Dwelling Units (EDU). There are currently 280 connections to the system, with all but 13 being served by a 3/4" water meter (actually 5/8" x 3/4"), which defines one EDU. Thirteen of the water services are 1" which are the equivalent of 1.66 EDU each, therefore the District currently serves a total of 267 connections times 1.0 EDU each, plus 13 times 1.66 EDU each, for a total in 2014 of 289 EDU. Due to the critical need for water, the District has projected demands for a period of 50 years, until the year 2065. The following table estimates the number of EDU within the service district at four different growth rates from 0.4% per year to 1% per year:

Vogr	Estimated Equivalent Dwelling Units (EDU)							
Tear	0.40%	0.60%	0.70%	0.80%	1.00%			
2014	289	289	289	289	289			
2015	290	291	291	291	292			
2020	296	300	301	303	307			
2030	308	318	323	328	339			
2040	321	338	346	356	374			
2050	334	358	371	385	413			
2060	347	381	398	417	457			
2065	354	392	412	434	480			

Arch Cape Domestic Water Supply District EQUIVALENT DWELLING UNIT PROJECTIONS GROWTH RATES FROM 0.4% to 1% PER YEAR

At a minimum, a growth rate of 0.4% should be anticipated, and if the growth more closely follows the urbanized areas within the County, a growth rate of 0.7% will be more accurate.

A population correlation is more difficult to project, however, based on the approximate current full time population in 2015 versus the number of EDU calculated for 2015, the full-time population projected for 50 years at 0.7% would equate to approximately 220 people, with seasonal impacts to increase the service population to approximately 1,280 by the year 2065.

The projected growth through the year 2065 can be accommodated within the current service district boundary without any comprehensive plan changes.

5.2 Schedule to Fully Exercise Each Permit

OAR 690-086-0170(2)

Due to the need to have sufficient water to meet peak day demands, both Shark Creek and Asbury Creek have been fully developed, however, not certificated. The physical improvements are in-place to put the entire permitted water right to beneficial use on each source.

Peak day demand projections in the year 2065 at a 0.7% growth rate are estimated at 114,000 gallons per day. At 0.8% the estimated peak day demand is nearly 120,000 gallons per day. Excepting the complications created by seasonal low flow conditions, the existing water rights can produce over 250,000 gallons per day. If all of the rights were available year-round, the District would not fully utilize all of the existing permitted rights by the year 2065. The long term demand for water will never reduce, but will always escalate in perpetuity. Accordingly, it is still critical that all water rights be protected until the time they are needed.

Seasonal fluctuations and redundancy needs dramatically alter this outlook. It is not unusual to see seasonal stream flows approaching the minimums protected for fish habitat. Under low flow conditions the permitted source of supply can be reduce by as much as 90%.

Prior to 2000, the District modified its original permit capacity to accommodate minimum flow rates to protect fish populations. In 1998, through discussions with the Oregon Department of Fish and Wildlife, and the Oregon Water Resources Department, the District relocated its point of withdrawal and incorporated a minimum stream flow into the permit to accommodate fish.

As a result of those permit changes and the seasonal fluctuation of stream flows, neither of the two existing sources are capable by themselves to serve the projected demand. The Shark Creek source has a permitted capacity of 0.12 CFS or 78,000 gallons per day if sufficient stream flow is available. This source is restricted to a peak withdrawal of 32,000 gallons per day if stream flow drops below 0.6 CFS for protection of fish populations. Typically, the Shark Creek stream flow requires this source to be discontinued through the summer dry periods.

The Asbury Creek source is permitted to withdraw 0.30 CFS, or 190,000 gallons per day, if adequate stream flow is available to maintain a minimum of 0.10 CFS for fish populations. However, this source is also impacted by the dry weather periods, which mandates reducing the system production capacity.

Redundancy also mandates the District develop both existing sources as well as explore alternative supplies.

5.3 Demand Forecasts

OAR 690-086-0170(3)

Per capita peak day demands are elusive; however, peak day demands per EDU are easily calculated. Based on the table provided in Section 2, the Peak Day Demand averaged over the past five years was 275 gallons per day per EDU.

The following table estimates the peak day demands through the year 2065 at estimated growth rates from 0.4% to 1% per year:

Year	Demand Projections (gallons per day)							
	0.40%	0.60%	0.70%	0.80%	1.00%			
2014	79,475	79,475	79,475	79,475	79,475			
2015	79,793	79,952	80,031	80,111	80,270			
2020	81,402	82,379	82,872	83,367	84,364			
2030	84,717	87,458	88,859	90,282	93,191			
2040	88,167	92,849	95,279	97,770	102,940			
2050	91,758	98,573	102,162	105,879	113,710			
2060	95,495	104,650	109,543	114,661	125,607			
2065	97,420	107,827	113,431	119,321	132,014			

Arch Cape Domestic Water Supply District DISTRICT PEAK DEMAND PROJECTIONS GROWTH RATES FROM 0.4% to 1% PER YEAR

5.4 Comparison of Projected need & Available Sources OAR 690-086-0170(4)

The District has a year round demand projected at 114,000 gallons per day by the year 2065. The Shark Creek source can provide a maximum of 78,000 gallons per day if adequate stream flow is present. Flow records, however, confirm this source must be discontinued in the dry periods.

The Asbury Creek source can provide up to 190,000 gallons per day if stream flow is adequate. Stream flow records indicate low flow periods can reduce the available capacity to less than half the permitted capacity.

As a result, neither of the existing developed sources is adequate to meet projected demands during the dry weather periods. The demands will not exceed the permitted rights, but the available water will limit the capacity. Permitted rights on Shark Creek will be fully utilized. Permitted rights on Asbury Creek could be reduced as much as 25% without impacting the realistic capacity of this source to meet long term demands.

The District is dependent upon the Asbury Creek source during all dry weather periods as a result of the minimum stream flow in Shark Creek. During the dry weather periods, the District has no redundancy. Alternative sources will need to be developed in the near future to better assure the system can operate without interruption.

The District is discussing the future need for a second reservoir on the South end of town to provide additional storage and redundancy in the case of a failure of the Shark Creek storage reservoir. The second reservoir is currently listed as a capital improvement project. A clearer picture of the need for and timing of this project will develop in the coming years.

5.5 Analysis of Alternative Sources

OAR 690-086-0170(5) and(8)

Conservation Measures

The District serves a large population of second homes and seasonal tourists. As a result, conservation measures are less effective. Seasonal population typically does not see the impacts of conservation on the water bills and has less of an incentive to reduce consumption.

Since the last Water Management and Conservation Plan was prepared in 1998, the peak day demands have reduced from an estimated 325 gallons per day per connection to 275 gallons per day per connection. The current demand projections of 275 gallons per EDU peak day demands are very low by comparison to most water systems. As a result, conservation measures are being implemented but are not anticipated to appreciably reduce the already low per capita consumption.

Interconnection with Other Municipal Supplies

The District is very isolated from adjacent municipal water systems with the exception of Cannon View Park system to the north, and the Falcon-Cove Beach Domestic Water Supply District to the south.

The Cannon View Park, Inc. system is located north of and abutting the District system. The Cannon View system pressure is approximately 5 psi below the District's, although the District could effectively operate during an emergency at a reduced pressure. The Cannon View source of supply is limited to one developed spring with a capacity of less than 10 gallons per minute and storage of 140,000 gallons. Both water suppliers have been discussing an interconnection for many years. Based on capacity and pressures, the Cannon View system could only minimally support the District's system during an emergency, and then for only a short time until the storage was depleted. The cost to connect to this system would be less than \$40,000.

The Falcon-Cove Beach Domestic Water Supply District (FCBDWSD) is located approximately 1.2 miles south of Arch Cape and serves less than 100 customers, most being second homes or vacation homes. Average daily demands for FCBDWSD are less than 30,000 gallons per day.

The FBCDWSD utilizes two spring sources, the northern spring being the only point accessible to Arch Cape. The south spring is isolated into the southern portion of the FCBDWSD service area. The FCBDWSD water rights on the North Spring are 0.13 CFS or 58 gpm. The records do not indicate the amount of available water during the dry season, but it is reasonable to conclude the spring source is limited and would not be able to produce the entire amount permitted right year-round.

The cost to connect to the FCBDSWD would be high due to the alignment along Highway 101 and the need to cross through the Hwy 101 tunnel, assuming ODOT would permit crossing through the tunnel. The cost to connect to the FCBDWSD is estimated at \$1.6 to \$2.0 million, well beyond the benefit this connection could provide.

There are no other potential municipal water supply systems in the area.

Surface Water

There is no potential to expand the existing developed rights on either Asbury or Shark Creeks due to the limited seasonal stream flows.

Arch Cape Creek or tributaries to Arch Cape Creek provide some opportunities. The District currently has undeveloped surface water rights on Dichter Creek totaling 0.3 CFS or 190,000 gallons per day. This source has some improvements in place as it originally served the population of the area. Seasonal flow rates have not been quantified for this source.

The Arch Cape Shingle Company (Permit No. 17721) has a certificated right of 0.23 CFS or 150,000 gallons per day for log pond and fire protection that could easily be transferred to the District. Similarly, Angelo Costanzo (Permit No. 24778) has a certificated right of 0.10 CFS or 65,000 gallons per day on Arch Cape Creek. Both the Shingle Mill and Costanzo rights date back over 50 years and should be able to be transferred.

The shortcoming of developing these rights is that it would require treatment as a surface water influenced stream. Similar to Asbury Creek, this source also has very limited

capacity in the dry weather periods. The logistics of transmission and treatment, as well as proximity to the wastewater facilities make this source less feasible than other options.

Groundwater

There are several wells within the District that provide an indication that groundwater would be a feasible alternative to supplement the surface water. The State has recently done some preliminary testing of groundwater quality within the District boundary. Results for the presence of nitrate, arsenic, pesticides, and other contaminants have not yet been released. The existing wells have limited capacity; however, the existing wells have a proven performance history and acceptable quality. Groundwater supplies may possibly provide a portion of the demand, and would provide needed redundancy.

Groundwater does not require treatment other than potentially for secondary contaminants such as hardness, iron, and manganese. As a result, with the addition of residual disinfectant, groundwater can be pumped directly into the system at effectively all locations of the distribution system.

Groundwater appears to be the most feasible source of additional long term water supplies due to availability and cost. As of the writing of this plan, one desirable groundwater option for the District would be to acquire ownership of a private well approximately 500 feet from the water treatment plant and reservoir. Preliminary testing from 2008 indicated that the well could provide a yield at 30 gpm, assuming that a significant increase in drawdown did not occur.

The prospect of the District's water supply being serviced or supplemented by wells will continue to be explored in the future. This need will be directly determined by the supply and quality of the water supplied by Shark and Asbury Creeks.



Confluence of Shark and Asbury Creeks

Appendix A Permits

Shark Creek Permit 53491 Asbury Creek Permit 53492

known Find

STATE OF OREGON

COUNTY OF CLATSOP

PERMIT TO APPROPRIATE THE PUBLIC WATERS

THIS PERMIT IS HEREBY ISSUED TO

ARCH CAPE WATER SERVICE DISTRICT PO BOX 28 ARCH CAPE, OREGON 97102

(503) 436-2790

The specific limits for the use are listed below along with conditions of use.

APPLICATION FILE NUMBER: S-73005

SOURCE OF WATER: SHARK CREEK, A TRIBUTARY OF ASBURY CREEK

PURPOSE OR USE: MUNICIPAL USE FOR UP TO 750 HOOKUPS FOR RESIDENCES AND BUSINESSES WITHIN THE SERVICE AREA OF THE ARCH CAPE DOMESTIC WATER SUPPLY DISTRICT.

VOLUME OF USE: 0.12 CUBIC FOOT PER SECOND (CFS)

PERIOD OF ALLOWED USE: YEAR ROUND

DATE OF PRIORITY: NOVEMBER 19, 1992 FOR 0.07 CUBIC FOOT PER SECOND AND JANUARY 19, 1993 FOR 0.05 CFS

POINT OF DIVERSION LOCATION: NW 1/4 SE 1/4, SECTION 19, T4N, R10W, W.M.; 250 FEET SOUTH AND 800 FEET EAST FROM THE C 1/4 CORNER OF SECTION 19

THE PLACE OF USE IS LOCATED AS FOLLOWS:

SE 1/4 NW 1/4 SW 1/4 SECTION 19 NW 1/4 NE 1/4 SE 1/4 NW 1/4 SW 1/4 SECTION 30 TOWNSHIP 4 NORTH, RANGE 10 WEST, W.M.

1. Until the permittee's water management and conservation plan has been approved as provided in Condition No. 4, the permittee will use water under this Permit to serve no more than the existing 230 hookups for residences and businesses within the service area of the Arch Cape Domestic Water Supply District. The permittee will certify its compliance with this condition in its annual report to the Water Resources Department. After the permittee's water management and conservation plan has been approved, permittee may use water under this Permit to serve any hookups within the Arch Cape Domestic Water Supply

Application S-73005 Water Resources Department



significant adverse impacts to the environment. Oregon Department of Fish & Wildlife and WaterWatch shall be considered commenters for purposes of OAR 690-86-910(12). The Plan shall address the elements and standards described in OAR 690-86-140 and in this condition. In addition to the matters listed in OAR 690-86-140(4), the long-range water supply element of the plan will address: (a) the District's maximum buildout needs; (b) measurement of potential water sources; (c) alternatives for funding development of identified water sources; (d) a list of alternatives (including a no-growth alternative) for meeting future water supply needs; and (e) a recommended alternative with an explanation as to why the recommended alternative is chosen. The Plan will be reviewed under OAR 690-86-910 and the requirements of this Permit. The Department will examine the record concerning the Plan and may not approve the Plan if it finds either that the Plan does not meet the requirements of OAR 690-86-910 or that the Plan will have a significant adverse impact on the environment. "'Significant adverse impact on the environment'" includes, but is not limited to, any impact of the Plan that, without mitigation developed in consultation with ODF&W, would be detrimental to the protection or recovery of a native fish species. Upon approval, the Plan will replace the water conservation plan described in Condition No. 3 and shall apply to the existing 230 hookups and all future hookups. The permittee shall notify Oregon Department of Fish & Wildlife and WaterWatch of any requests for extension of time or waiver under OAR 690-86-910(13) and (14), and Oregon Department of Fish & Wildlife and WaterWatch shall have twenty (20) days in which to respond to any such request. OAR 690-86-910(15) shall not apply to this permittee. If the proposed Plan is disapproved, the permittee may submit a revised Plan within one year of the date on which the Plan is disapproved and any appeals of the disapproval are resolved. Any such plan will be processed pursuant to the procedures described in this condition.

5. By January 31 of each year, the permittee shall submit a report to the Water Resources Department and the Oregon Department of Fish & Wildlife concerning (1) certification of the permittee's continuing compliance with Condition No. 1; (2) the permittee's efforts to implement the water conservation or water management and conservation plan then in effect; (3) the surface flows measured under Condition No. 6 for the prior calendar year; and (4) general water use information, including the information measured and recorded under Condition Nos. 7 and 8 for the prior year. The permittee shall file this report more frequently if the Water Resources Department requests it.

6. Permittee will measure and monitor the stream flow in Shark Creek for the summer of 1994 (July 1, 1994 through September 30, 1994) the 1995 water year (October 1, 1994 through September 30, 1995) in accordance with the Streamflow Monitoring Plan for Arch Cape Water District, a copy of which is on file with the Water Resources Department. Permittee will submit a streamflow monitoring report to the Water Resources Department on or before February 15, 1996.

Application S-73005 Water Resources Department

7. Before water use may begin under this Permit, the permittee shall install a meter or other suitable measuring device as approved by the Director. The permittee shall maintain the meter or measuring device in good working order. The permittee shall allow the watermaster access to the meter or measuring device; provided, however, where the meter or measuring device is located within a private structure, the watermaster shall request access upon reasonable notice.

The permittee shall install and maintain a staff gauge to measure surface flows in Shark Creek. The permittee will measure flows at least once weekly and will cause the staff gauge to be re-rated every 8. year. Measurements of Shark Creek will include the inflow and outflow from the permittee's reservoir. The permittee shall measure and keep a record of the quantity of water diverted each year, the periods of water use, the place and nature of use of water under the Permit, the rate and duty of water used each month, the average rate of diversion, and the flows remaining in Shark Creek below the point of diversion. The permittee shall maintain such records for five year increments so that it always has on file the records from the previous five years. When the permittee determines that streamflows in Shark Creek are approaching or falling below 0.2 cfs, the permittee shall promptly notify the Oregon Department of Fish & Wildlife and the Water Resources Department and shall thereafter measure and report the quantity of water diverted and the quantity of water immediately downstream from the permittee's diversion at least weekly or more frequently as required by the Oregon Department of Fish & Wildlife or the Water Resources Department.

9. The permittee shall install, maintain, and operate fish screening and bypass devices as required by the Oregon Department of Fish & Wildlife to prevent fish from entering the proposed diversion. The required screens and by-pass devices are to be in place, functional and approved by an Oregon Department of Fish & Wildlife representative prior to diversion of water under this Permit.

The permittee shall install, maintain and operate a fishway as required by Oregon Department of Fish & Wildlife to allow indigenous adult and juvenile fish access to habitat areas above and below the existing weir. The required fishway is to be in place, functional, inspected and approved by an Oregon Department of Fish & Wildlife representative prior to diversion of water under this Permit.

Except for its existing weir, the permittee shall not construct any artificial in-channel obstruction to fish passage in Shark Creek.

10. The permittee will remove accumulated sediments from the instream Shark Creek reservoir mechanically rather than by flushing the reservoir. The 0.6 cfs minimum flow will be maintained during the sediment removal and filling process and will be free of sediments and turbidity.

In the event of a request for a change in point of appropriation, an additional point of appropriation or alteration of the appropriation

Application S-73005 Water Resources Department

facility associated with this authorized diversion, the quantity of water allowed herein, together with any other right, shall not exceed the capacity of the facility at the time of perfection of this right.

This right is limited to any deficiency in the available supply of any prior right existing for the same land.

STANDARD CONDITIONS

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

Failure to comply with any of the provisions of this permit may result in action including, but not limited to, restrictions on the use, civil penalties, or cancellation of the permit.

This permit is for the beneficial use of water without waste. The water user is advised that new regulations may require the use of best practical technologies or conservation practices to achieve this end.

By law, the land use associated with this water use must be in compliance with statewide land-use goals and any local acknowledged land-use plan.

The use of water allowed herein may be made only at times when sufficient water is available to satisfy all prior rights, including prior rights for maintaining instream flows.

The Director finds that the proposed use(s) of water described by this permit, as conditioned, will not impair or be detrimental to the public interest.

This permit is issued to correctly describe the minimum stream flow for Shark Creek. Permit 53461, dated August 12, 1998, is superseded by this instrument and is of no further force or effect.

Actual construction work shall begin by August 12, 1999. Complete application of water to the use shall be made on or before October 1, 2002. Within one year after complete application of water to the proposed use, the permittee shall submit a claim of beneficial use, which includes a map and report, prepared by a Certified Water Rights Examiner (CWRE) .

Issued, Octoper 2(, 1998 Wight or Martha O. Pagel,

Director Water Resources Department

Application S-73005 Basin 1

Water Resources Department Volume 3 Basin 1 Misc.

PERMIT 53491 District 1

Kuchel LIMO STATE OF OREGON COUNTY OF CLATSOP PERMIT TO APPROPRIATE THE PUBLIC WATERS THIS PERMIT IS HEREBY ISSUED TO ARCH CAPE SERVICE DISTRICT PO BOX 28 (503) 436-2790 ARCH CAPE, OREGON 97102 The specific limits for the use are listed below along with conditions of use. APPLICATION FILE NUMBER: S-73332 SOURCE OF WATER: ASBURY CREEK, A TRIBUTARY OF PACIFIC OCEAN PURPOSE OR USE: MUNICIPAL USE FOR UP TO 750 HOOKUPS FOR RESIDENCES AND BUSINESSES WITHIN THE SERVICE AREA OF THE ARCH CAPE DOMESTIC WATER SUPPLY DISTRICT. RATE OF USE: 0.30 CUBIC FOOT PER SECOND PERIOD OF ALLOWED USE: YEAR ROUND DATE OF PRIORITY: APRIL 6, 1993 POINT OF DIVERSION LOCATION: SE 1/4 SW 1/4, SECTION 19, T4N, R10W, W.M.; 865 FEET NORTH AND 1290 FEET WEST FROM THE S% CORNER OF SECTION 19. THE PLACE OF USE IS LOCATED AS FOLLOWS: SE 1/4 NW 1/4 SW 1/4 SECTION 19 NW 1/4 NE 1/4 SE 1/4 NW 1/4 SW 1/4 SECTION 30 TOWNSHIP 4 NORTH, RANGE 10 WEST, W.M. Until the permittee's water management and conservation plan 1. has been approved as provided in Condition No. 4, the permittee may use water under this Permit to serve no more than the existing 230 hookups for residences and businesses within the service area of the Arch Cape Domestic Water Supply District. These 230 hookups are the same as those identified in Permit No. 52408 for Shark Creek. Pending Plan approval under Condition No. 4, water may be used to serve up to 10 hookups in addition to the 230 hookups if (I) Arch Cape submits the Plan contemplated by Condition No. 4 and diligently implements it pending WRD Application S-73332 Water Resources Department PERMIT 53492



Use of water under this Permit for more than the 230 existing 4. hookups shall be contingent upon the development and implementation of a water management and conservation plan (the "Plan") described below. On or before October 1, 1996, the permittee shall submit the proposed Plan to the Water Resources Department with copies to the Oregon Department of Fish & Wildlife and WaterWatch of Oregon. Notwithstanding the public comments provisions in OAR 690-86, Oregon Department of Fish & Wildlife and WaterWatch will have 45 days in which to review and comment on the Plan and may raise issues relating to the elements and standards described in OAR 690-86 and whether the Plan will prevent significant adverse impacts to the environment. Oregon Department of Fish & Wildlife and WaterWatch shall be considered commenters for purposes of OAR 690-86-910(12). The Plan shall address the elements and purposes of OAR 690-86-910(12). The Flan Shall address the element. In standards described in OAR 690-86-140 and in this condition. In addition to the matters listed in OAR 690-86-140(4), the long-range water supply element of the plan will address: (a) the District's maximum buildout needs; (b) measurement of potential water sources; (c) alternatives for funding development of identified water sources; (d) a list of alternatives (including a no-growth alternative) for meeting future water supply needs; and (e) a recommended alternative with an explanation as to why the recommended alternative is chosen. The Plan will be reviewed under OAR 690-86-910 and the requirements of this Permit. The Department will examine the record concerning the Plan and may not approve the Plan if it finds either that the Plan does not meet the requirements of OAR 690-86-910 or that the Plan will have a significant adverse impact on the environment. "'Significant adverse impact on the environment'" includes, but is not limited to, any impact of the Plan that, without mitigation developed in consultation with ODF&W, would be detrimental to the protection or recovery of a native fish species. Upon approval, the Plan will replace the water conservation plan described in Condition No. 3 and shall apply to the existing 230 hookups and all future hookups. The permittee shall notify Oregon Department of Fish & Wildlife and WaterWatch of any requests for extension of time or waiver under OAR 690-86-910(13) and (14), and Oregon Department of Fish & Wildlife and WaterWatch shall have twenty (20) days in which to respond to any such request. OAR 690-86-910(15) shall not apply to this permittee. If the proposed Plan is disapproved, the permittee may submit a revised Plan within one year of the date on which the Plan is disapproved and any appeals of the disapproval are resolved. Any such plan will be processed pursuant to the procedures described in this condition.

5. By January 31 of each year, the permittee shall submit a report to the Water Resources Department and the Oregon Department of Fish & Wildlife concerning (1) certification of the permittee's continuing compliance with Condition No. 1; (2) the permittee's efforts to implement the water conservation plan or water management and conservation plan then in effect; (3) the surface flows measured under Condition No. 6 for the prior calendar year; and (4) general water use information, including the information measured and recorded under Condition Nos. 7 and 8 for the prior year. The permittee shall file this report more frequently if the Water Resources Department requests it.

Application S-73332 Water Resources Department

6. Permittee will measure and monitor the stream flow in Asbury Creek for the summer of 1994 (July 1, 1994 through September 30, 1994) and water year 1995 (October 1, 1994 through September 30, 1995) in accordance with the Streamflow Monitoring Plan for Arch Cape Water District, a copy of which is on file with the Water Resources Department. Permittee will submit a streamflow monitoring report to the Water Resources Department on or before February 15, 1996.

7. Before water use may begin under this Permit, the permittee shall install a meter or other suitable measuring device as approved by the Director. The permittee shall maintain the meter or measuring device in good working order. The permittee shall allow the watermaster access to the meter or measuring device; provided, however, where the meter or measuring device is located within a private structure, the watermaster shall request access upon reasonable notice.

8. The permittee shall install and maintain a staff gauge to measure surface flows in Asbury Creek. The permittee will measure flows at least once weekly and will cause the staff gauge to be re-rated every year. The permittee shall measure and keep a record of the quantity of water diverted each year, the periods of water use, the place and nature of use of water under the Permit, the rate and duty of water used each month, the average rate of diversion, and the flows remaining in Asbury Creek below the point of diversion. The permittee shall maintain such records in five year increments so that it always has on file the records from the previous five years. When the permittee determines that streamflows in Asbury Creek are approaching or falling below 0.5 cfs, the permittee shall promptly notify the Oregon Department of Fish & Wildlife and the Water Resources Department and shall thereafter measure the quantity of water diverted and the quantity of water immediately downstream from the permittee's diversion at least daily and report the quantity so diverted at least weekly or more frequently as required by the Oregon Department of Fish & Wildlife or the Water Resources Department.

9. The permittee shall install, maintain, and operate fish screening and bypass devices as required by the Oregon Department of Fish & Wildlife to prevent fish from entering the proposed diversion. The required screens and by-pass devices are to be in place, functional and approved by an Oregon Department of Fish & Wildlife representative before permittee diverts water pursuant to this Permit. The permittee shall not construct, operate or maintain any dam or artificial obstruction to fish passage in the channel of the subject stream.

The permittee shall install, maintain and operate a fishway as required by the Oregon Department of Fish & Wildlife to allow indigenous adult and juvenile fish access to habitat areas above and below the existing weir. The required fishway is to be in place, functional, inspected and approved by an Oregon Department of Fish & Wildlife representative prior to diversion of water under this Permit.

Application S-73332 Water Resources Department

PAGE 5 This right is limited to any deficiency in the available supply of any prior right existing for the same land. STANDARD CONDITIONS The use shall conform to such reasonable rotation system as may be ordered by the proper state officer. Failure to comply with any of the provisions of this permit may result in action including, but not limited to, restrictions on the use, civil penalties, or cancellation of the permit. This permit is for the beneficial use of water without waste. The water user is advised that new regulations may require the use of best practical technologies or conservation practices to achieve this end. By law, the land use associated with this water use must be in compliance with statewide land-use goals and any local acknowledged land-use plan. The use of water allowed herein may be made only at times when sufficient water is available to satisfy all prior rights, including prior rights for maintaining instream flows. The Director finds that the proposed use(s) of water described by this permit, as conditioned, will not impair or be detrimental to the public interest. This permit is issued to correctly describe a change of diversion as described in T-7981 minimum stream flow in Shark Creek and a minimum flow of 0.1 cfs in Asbury Creek. Permit 53462, dated August 12, 1998, is superseded by this instrument and is of no further force or effect. Actual construction work shall begin by August 12, 1999. Complete application of water to the use shall be made on or before October 1, 2002. Within one year after complete application of water to the proposed use, the permittee shall submit a claim of beneficial use, which includes a map and report, prepared by a Certified Water Rights Examiner (CWRE). Issued October 1998 to Martha O. Pagel, Director Water Resources Department Application S-73332 Water Resources Department PERMIT 53492 Basin 1 Volume 3 Basin 1 Misc. District 1

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Appendix B: Map of Current Service Area

Appendix C:

Arch Cape Water District - Water Rights Summary

		_				(s)	Actu	a I D	iver	sion	fe	
Application No	Permit No.	Certificate No.	Priority Date	Source	Use	Allowed Rate (c	Maximum Rate Diverted to Date (cfs)	Maximum Annual Diverted to Date (MG)	Average Monthly Diversion (MG)	Average Daily Diversion (Gallons)	Completion Da	Notes
S-73005	53491	# 27506 for .05 cfs C.O.B.U. submitted: 5-17-07	Nov. 19,1992 for .07 cfs Jan 19,1993 for .05 cfs	Shark Creek	М	0.12	0.12	12.1 (1990)	0.857	28,483	October 1, 2002	
S-73332	53492		April 6,1993	Asbury Creek	М	0.30	0.30	4.4 (2004)	1.689	56,300	October 1, 2002	
29112	R-1633	27507	April 12, 1954	Shark Creek	S	N/A	N/A	N/A	N/A	N/A/	Sept. 23, 1960	Shark Creek dam and Storage
29368	23142	27508	July 30,1954	Dichter Creek	D*	0.20	N/A	N/A	N/A	N/A	October 1, 1957	
30962	24778	27509	April 2, 1957	Dichter Creek	D	0.10	N/A	N/A	N/A	N/A	October 1, 1959	

Use Legend: M - Municipal, S - Storage, D - Domestic Use, D* - Domestic use Including Arch Cape and Mill Pond

Appendix D: Oregon Dept. of Fish and Wildlife Letter to OWRD January 14, 1998

Bill Fujii Oregon Water Resources Dept. Commerce Bldg. 158 12th St. NE Salem, Or. 97310 DEPARTMENT OF FISH AND WILDLIFE

North Coast Fish District

Dear Bill:

The Oregon Dept. of Fish and Wildlife (ODFW)has reviewed the latest (August, 1997) Arch Cape Water District's (district) Management and Conservation Plan (plan) and offers the following comments:

The plan states in several places (Page 54 and 59) that given the expanded water rights on both Shark and Asbury Creeks that there is adequate water available to service the existing 230 hookups and with additional storage likely needed by year 2001-2008 (Page 61) to permit full buildout (750 hookups - Page 59). The growth is predicted to occur at the rate of 3-10 hookups per year (Page 68). The important role of Asbury Cr. in providing this water is emphasized numerous times within the plan.

Given the June-Sept. 1995 and 1996 (characterized as "wet years" on Page 36) <u>average</u> monthly flow data on Page 48, it appears that expectations of adequate water supplies are optimistic at the current usage and become less realistic as new hookups are added each year. This is especially true of Asbury Cr. water where <u>average</u> September, 1995 flows (0.44 cfs) barely meet the required minimum instream flow of 0.40 cfs. There were obviously periods of several days when stream flows fell below 0.40 cfs. <u>Average</u> monthly flows in August and September, 1996 would not have permitted full use of the district's Asbury Cr. water right.

As reported on Page 54, in 1992 there was little water available from Shark Cr. despite withdrawals exceeding the then authorized 0.05 cfs water right. It appears that given a year similar to 1992, even with the expanded water rights there would be no additional water available from either Shark or Asbury Cr. Water consumption per hookup has likely decreased since 1992 due to conservation oriented attitudes and leak repair but there are an additional 9 new hookups since 1992 with an additional 10 scheduled upon approval of the plan. Predictions are for 3 to 10 new hookups each year there after. An unrealistic assumption that confounds the analysis of water availability is to use the annual average of 135 gallons/day/hookup as representative of use during the critical low flow summer period when actual usage is 149 to 194 gallons/day/hookup (Page 65). Any such analysis should deal with actual usage and stream flows during the period when the latter is limited.



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As described in my letter of September 22, 1996 to the district that addresses fish habitat and fishery resources, past Shark Cr. diversions have likely had significant adverse in the provided and the native cutthroat trout population. The major impacts were during AND low flow periods. This impact not only occurred in Shark Cr. below the diversion point but also in Asbury Cr. downstream of it's confluence with Shark Cr. A very significant impact likely occurred in 1992 when Shark Cr. was drawn down to at least 0.04 cfs. Expansion of the number of hookups will exacerbate the adverse impacts during low flow periods to the extent that water is diverted from Shark Cr. or Asbury Cr. at any other location than the proposed Asbury Cr. diversion point immediately above Highway 101. The district has expressed an interest in amending their Asbury Cr. permit to validate the lower diversion point and to the extent that it is used during low flow periods (more specifics on this in the recommendations section of this letter) the adverse impacts on the fishery resource will be mitigated.

After reviewing the latest revision of the plan, it is my opinion that the significant reduction in stream flows during low flow periods as permitted by Permit #52408 (Shark Cr.) and Permit # 52409 (Asbury Cr.) constitutes "significant adverse impact of the environment" as defined in Condition #4 of the above mentioned permits. Without appropriate mitigation and if the Water Resources Dept. agrees with ODFW's opinion, it would appear that your agency cannot approve the plan.

OTHER FISHERY ISSUES

On Page 13 under "Storage and Regulation Facilities" it is stated that fish passage "is not possible". Fish passage could be designed and constructed at the Shark Cr. diversion dam but ODFW did not feel it was realistic to force the district to go to this expense when a natural barrier a short distance downstream precluded fish passage beyond that point. As noted in my letter of April 11, 1996 (included between Pages 4 and 5 of the plan), ODFW cannot waive the statutory fish passage requirement.

Page 15, Item # 4 discusses the Highway 101 fish passage barrier. Oregon Dept. of Transportation (ODOT) is planning to install a fish ladder to allow anadromous fish (coho salmon, winter steelhead and sea-run cutthroat trout) passage above the Highway 101 culvert sometime within the next two years or so. (telephone conversation with Mr. Steve Carter [503-325-2178] on 1/6/98). Accordingly, any diversion structure on Asbury Cr. should be designed to facilitate passage of these fish. The renewed ODOT interest in improving fish passage is likely related to Governor Kitzhaber's "Oregon Plan" designed to prevent a Federal Threatened or Endangered listing for any or all of these three species. It will probably be necessary to reintroduce fish from a suitable donor stock in order to reestablish a sustainable population for all the above species.



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On Page 71 under "Local residents - fish observations" opinions are presented that question whether or not there is a viable fishery in Asbury Cr. and also whether or not EPARTMENT OF anadromous species ever were present in the watershed due to the difficult access acF9SFI AND the beach. Angling regulations on coastal streams currently do not allow retention of cutthroat trout but prior to this recent (1997) restriction we have records of an angler catching a number of legal sized (8") trout with his biggest fish about 11". This angler reported experiencing similar angling success on several trips. Angler use is very light in the watershed. A long time local resident, Dudley Nelson, Sr., remembers catching searun cutthroat in the 1920s prior to Highway 101 construction . He doesn't recall seeing coho or steelhead but spent little time in the watershed when these adults would have been present(late fall - early spring). Anadromous fish inhabit many streams along the Oregon coast where access into the stream is only possible during high flows or high tides. Access into Asbury Cr. would only be possible during those conditions.

RECOMMENDATIONS

Upon detailed review of the latest plan; ODFW believes that the plan and associated water right permits do not assure the district of a sufficient, reliable water quantity during low flow periods of dry years, will have significant adverse impacts on the fishery resources and do not provide sufficient mitigation for the adverse impacts. The suggested mitigation that would move the Asbury Cr. diversion point downstream is the only mitigation provided and it would only become effective when Shark Cr. had been drawn down to 0.04 cfs. It is apparent that Shark Cr. would be greatly reduced before any mitigation was provided. Fish and fish habitat in both streams will be significantly adversely impacted. The deficiencies will become more frequent and of greater duration as more hookups are added to the system.

The following recommended changes in the district's water right permits would provide an acceptable compromise and remove ODFW's objections to the amended permit/plan package:

1. Amend the Shark Cr. permit to state that when Shark Cr. flows below the diversion point fall to 0.6 cfs, all diversions will be switched to lower Asbury Cr. Analysis of Page 48 flow data indicates that this switch would most likely occur from late June through mid-October. The recommendation to try to maintain 0.6 cfs is based on our best professional judgment. Natural flows in some dry months will not even be sufficient to maintain this flow level. If the district does not agree with the recommended flow, they could initiate a flow assessment study that looks closely at the relationship between various flow levels and available habitat at each level. The district should insure that the contractor and assessment technique would be acceptable to ODFW before embarking on such a study.

Oregon

2. Amend the Asbury permit to specify that the diversion point be no more than 100 yards above the Highway 101 culvert, that the diversion structure permit fish passage and that the intake must be properly screened.

DEPARTMENT OF

3. Once the diversion point is relocated as described in # 2 above, further amend the FISH AND Asbury permit to ask for additional water rights and a lower minimum flow at the ne $W_{ILDLIFE}$ diversion point. A minimum flow as low as 0.1 cfs would be acceptable to ODFW. Given the flow data on Page 48, natural flow from the two streams minus the reduced minimum Asbury Cr. flow would have provided the district with 0.94 cfs in September 1995 (0.60 + 0.44 - 0.10) and 0.77 cfs in September 1996 (0.29 + 0.58 - 0.10).

The above permit amendments would insure the district adequate water for complete buildout even in dry years and have minimal impact on the fishery resources. The downside to the district would be the additional pumping costs.



The above recommendations seems to be in conflict with ODFW's August 16, 1997 letter to the district's Dick Pearson. However, review of the most recent plan update and associated water right permits revealed that there would be little mitigation associated with moving the Asbury diversion point as this would not used until Shark Cr. was virtually dewatered at 0.04 cfs. Finally, it does not appear that the present plan provides the district a reliable quantity of water, now or into the future. We believe our recommendations will provide for fish , fish habitat and the district's future water needs.

Please feel free to contact me at 503-861-6054 if you should have any questions. Thank you for the opportunity to comment on this issue.

Sincerely Walt Weber Fishery Biologist

cc: ODFW- A. Smith, R. Klumph, J. Sheehan, J. Zarnowitz Dept. of Justice - Ian Whitlock Water Watch - Kimberly Priestley Arch Cape Water District - Dick Pearson



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Appendix E: Cannon View Park Emergency Water Agreement

CANNON VIEW PARK, INC. PO Box 65 Arch Cape, OR 97102

February 13, 1998

Mr. Bill Morgan, President Arch Cape Water/Sanitary District PO Box 28 Arch Cape, OR 97102

Dear Mr. Morgan:

This letter is in response to your letter to Al Nelson dated January 12, 1998 regarding the availability of an emergency water source for the Arch Cape Domestic Water Supply District from Cannon View Park, Inc.

Cannon View Park, Inc. is willing to supply your Water District with water only in the event of a major, substantial disruption of your water supply as a result of earthquake, flood or fire. Cannon View Park, Inc. would supply emergency water provided that it does not interfere with the requirement for the domestic and fire protection needs of members of Cannon View Park, Inc.

As part of this arrangement, Cannon View Park, Inc. requests that the agreement be reciprocal, that is, in the event of a major, substantial disruption of our water supply, Arch Cape Water/Sanitary District would provide water for the needs of members of Cannon View Park, Inc.

In such event, the amount of water, means of transportation, and cost, if any, would be determined by mutual agreement at the time of need. Supplying of water under the above conditions would continue only during a period that would be necessary for expeditious repair of the facilities of either party.

If this reciprocal agreement is satisfactory, please advise at your earliest convenience.

Very truly yours,

Richard C. Petrone, President Cannon View Park, Inc.