BEFORE THE WATER RESOURCES DEPARTMENT
OF THE STATE OF OREGON

In the Matter of Application for Extension of Time for Permit S-36881 in the name Pacific City Joint Water Sanitary Authority *Applicant* and WaterWatch of Oregon, Inc. *Protestant*	)))))))	SETTLEMENT AGREEMENT

The Oregon Water Resources Department ("OWRD"), Pacific City Joint Water Sanitary Authority ("PCJWSA"), and WaterWatch of Oregon, Inc. ("WaterWatch") (collectively "the parties") do hereby stipulate and agree in this Settlement Agreement ("Agreement") as follows:

A. Background

1. On December 17, 2007, PCJWSA submitted an application for an extension of time, requesting that the time to complete construction of the water system and the time to perfect the right under the terms of Permit S-36881 be extended from October 1, 1990 to October 1, 2020.
2. On January 29, 2008, OWRD issued a Proposed Final Order ("PFO") recommending the extension be granted.
3. On March 14, 2008, WaterWatch filed a timely protest.
4. OWRD, applicant PCJWSA and protestant WaterWatch agree that all issues related to WaterWatch's protest to the Proposed Final Order on the application for extension of time for Permit S-36881 are resolved solely on the following terms.

B. Consent

1. Applicant PCJWSA and protestant WaterWatch each acknowledge that it has read and understands the terms of this Agreement, and the terms of the attached draft Final Order Incorporating Settlement Agreement granting Extension of Time for Permit Number S-36881, which are hereby incorporated by reference as if set forth fully herein.
2. PCJWSA and WaterWatch understand and agree that this Agreement and all documents incorporated by reference and the Final Order to be issued consistent with this Agreement set forth the entire Agreement of the parties.
3. PCJWSA and WaterWatch understand and agree that this Agreement and issuance of a Final Order Incorporating Settlement Agreement granting Extension of Time for Permit Number S-36881 that conforms to the attached draft Final Order will constitute the complete and final resolution of the WaterWatch protest.
4. PCJWSA and WaterWatch waive any and all right to petition for judicial review of this Agreement, waive any and all right to request reconsideration, petition for judicial review

or appeal the Final Order Incorporating Settlement Agreement Granting Extension of Time for Permit Number S-36881 unless the Final Order fails to conform to the attached draft Final Order in which case PCJWSA and WaterWatch may exercise any and all applicable rights including those described in this paragraph.

C. Terms of the Agreement

1. Within 45 days of the signing of this Agreement by all parties, OWRD will issue a Final Order Incorporating Settlement Agreement Granting Extension of Time for Permit Number S-36881 which conforms to this Agreement and the attached draft Final Order Incorporating Settlement Agreement Granting Extension of Time for Permit Number S-36881.
2. Each Party to this Settlement Agreement represents, warrants, and agrees that the person who executed this Agreement on its behalf has the full right and authority to enter into this Agreement on behalf of that Party and bind that Party to the terms of this Settlement Agreement.
3. Each Party to this Settlement Agreement certifies that it has had a reasonable opportunity to review and request changes to the Settlement Agreement, and that it has signed this Settlement Agreement of its own free will and accord.
4. Each Party to this Settlement Agreement certifies that it has read the entire Settlement Agreement, including the draft Final Order Incorporating Settlement Agreement Granting Extension of Time for Permit Number S-36881, and understands and agrees with the contents thereof.
5. The Parties agree that nothing in this Settlement Agreement establishes factual, legal, or policy precedent. The parties recognize that nothing in this settlement purports to limit the authority of any federal agency to require, authorize or enforce a bypass flow greater than 2.0 cfs or any other conditions in connection with any federal permit or regulatory authorization that may be required for operation of the intake facilities.
6. This Settlement Agreement may be signed in counterparts.

Dwight French, Administrator,
Water Right Services Division
for
Phillip C. Ward, Director
Oregon Water Resources Department

4-12-12
Date

Douglas H. Kellow, Board Chairman
Pacific City Joint Water-Sanitary Authority

05-01-2012
Date

Tony Owen, Manager
Pacific City Joint Water-Sanitary Authority

5-1-12
Date

John DeVoe
WaterWatch of Oregon, Inc.

4/12/12
Date

Oregon Water Resources Department
Water Right Services Division

Water Rights Application
Number S-49201

Final Order Incorporating Settlement Agreement
Granting Extension of Time for Permit Number S-36881
Permit Holder: Pacific City Joint Water-Sanitary Authority

Permit Information

Application File S-49201/ Permit S-36881
Basin 18 – Mid Coast Basin / Watermaster District 1
Date of Priority: May 3, 1972

Authorized Use of Water

Source of Water:	Horn Creek, a Tributary to the Nestucca River
Purpose or Use:	Quasi-Municipal
Maximum Rate:	2.0 Cubic Feet per Second (cfs)

Appeal Rights

This is a final order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

Application History

The Department issued Permit S-36881 on July 27, 1973. The permit called for completion of construction by October 1, 1975, and complete application of water to beneficial use by October 1, 1976. On December 17, 2007, Pacific City Joint Water-Sanitary Authority ("PCJWSA") submitted an application to the Department for an extension of time for Permit S-36881. In accordance with OAR 690-315-0050(2), on January 29, 2008 the Department issued a Proposed Final Order proposing to extend the time to complete construction to October 1, 2020, and the time to fully apply water to beneficial use to October 1, 2020. The protest period closed March 14, 2008, in accordance with OAR 690-315-0060(1). WaterWatch of Oregon, Inc. ("WaterWatch") filed a timely protest. The Proposed Final Order dated January 29, 2008 is hereby incorporated in this Final Order as if set forth fully herein, except as modified by this Final Order.

Settlement Background

As of May 1, 2012 PCJWSA and WaterWatch signed a settlement agreement requiring the inclusion of additional conditions on the use of water under this permit and any subsequent certificate(s), and on use of surface water from Horn Creek. The Settlement Agreement between PCJWSA and WaterWatch is hereby incorporated in this final order as if set forth fully herein, and attached as part of this final order.

On May 20, 2009, the National Marine Fisheries Service issued Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Horn Creek Municipal Water Intake which included a Biological Opinion, Incidental Take Statement and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation (for Corps No. NWP-2008-161) ("Biological Opinion," included as Attachment 1).[1] The "Terms and Conditions" and "Reasonable and Prudent Measures" contained in the Biological Opinion were included as non-discretionary special conditions of a permit issued by the U.S. Army Corps of Engineers to PCJWSA on June 2, 2009 for construction and operation of a new water intake facility for PCJSWA (Corps No.: NWP-2008-161, "Corps Permit".) The "Terms and Conditions" and "Reasonable and Prudent Measures", required by the Corps Permit, are contained in the Biological Opinion attached to this Final Order as Attachment 1. A copy of the entire Corps Permit, which includes the Biological Opinion, is available in the Department's file for Permit S-36881.

PCJWSA has four authorized points of diversion on Horn Creek that authorize a combined total diversion of 2.7 cfs under various water rights, as listed below:

1. Upper Horn Creek: SESE, Section 8, Township 4 South, Range 10 West, W.M. Authorized point of diversion for Certificate 86807 for 0.01 cfs of water.

2. East Creek Intake, tributary to Horn Creek: 330 FEET NORTH & 50 FEET EAST FROM W ¼ CORNER, SECTION 16, BEING WITHIN THE SWNW, Section 16, Township 4 South, Range 10 West, W.M. Authorized point of diversion for Certificate 86808 for 0.01 cfs of water.

3. Original Intake on Lower Horn Creek: 2445 FEET NORTH & 2514 EAST FROM SE CORNER OF SECTION 19, BEING WITHIN THE NESW, Section 20, Township 4 South, Range 10 West, W.M. Authorized point of diversion for Permit 36881, 2.0 cfs of water.

4. Newly constructed intake, located near the Original Intake on Lower Horn Creek: 2450 FEET NORTH & 2575 FEET EAST FROM SW1/4 CORNER, SECTION 20, BEING WITHIN THE NESW, Section 20, Township 4 South, Range 10 West, MW. Authorized point of diversion under Transfer T-11126 for 0.68 cfs (0.19 + 0.49) of

[1] The cover page of the consultation document states an incorrect issue date of May 20, 2008.

water.

CONDITIONS FOR PERMIT S-36881

The following conditions are hereby added as conditions to permit S-36881 and will included as conditions to any certificate(s) subsequently issued for permit S-36881.

1. Development Limitations

Diversion of any water beyond 1.35 cfs under Permit S-36881 shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan (WMCP) under OAR Chapter 690, Division 86. The required WMCP shall be submitted to the Department within 3 years of an approved extension application. Use of water under Permit S-36881 must be consistent with this and subsequent WMCP's approved under OAR Chapter 690, Division 86 on file with the Department.

The deadline established in this Final Order for submittal of a WMCP shall not relieve a permit holder of any existing or future requirement for submittal of a WMCP at an earlier date as established through other orders of the Department. A WMCP submitted to meet the requirements of this order may also meet the WMCP submittal requirements of other Department orders.

2. Settlement Conditions

The following three conditions are added pursuant to the Settlement Agreement:

2.a. Total surface water withdrawals from any of the points of diversion authorized under Certificates 86807 and 86808, under Transfer T-11126 and Permit 36881 and any subsequent certificates issued thereunder, will be limited to a combined rate of 2.7 cfs.

2.b. Withdrawal of surface water from Horn Creek will not be allowed when stream flow is less than 2.0 cfs; however, for as long as Condition 3 of the Biological Opinion or the Corps Permit is in effect, the withdrawal of surface water will not be allowed when stream flow is less than 2.5 cfs. Condition 3 of Biological Opinion is copied below:

> 3. To implement reasonable and prudent #3 (instream flows) the Corps shall ensure that water withdrawals at the Horn Creek intake do not exceed 2.7 cfs, and minimum instream flows do not drop below 2.5 cfs.
>
> a. When water withdrawals on Horn Creek reach 2.0 cfs, instream flows shall be measure[d] concurrently at two locations until water withdrawals drop below 2.0 cfs. The first location shall be located approximately 250 feet from

the confluence of Horn Creek and the Nestucca River. The second location shall be located approximately 250 feet above the head of tide.

Biological Opinion, Attachment 1, p. 31.

For as long as the Biological Opinion is in effect, stream flow measurements will be taken in accordance with Paragraph 3.a. of Attachment 1 (as shown above), except that if the requirements of Paragraph 3.a are amended by agreement of NOAA and Pacific City, the requirements as amended shall apply. Thereafter, stream flow measurement for purposes of complying with Condition **2.b.** shall be taken below the lowest PCJSWA point of diversion on Horn Creek. The permit holder shall be responsible for maintaining and operating a stream gauge at such location.

2.c. The water right permit holder will provide copies to Oregon Water Resources Department ("OWRD") of all reports prepared pursuant to Conditions 4 (d)- (g) of the Biological Opinion for as long as such reports are required under the Corps Permit. At such time as reports are no longer required under the Corps Permit, the water right permit holder will provide annual reports to OWRD, or more frequently if requested by OWRD, of daily stream flow measurements and daily surface water withdrawals. Conditions 4(d) – (g) of the Biological Opinion are copied below:

4. To implement reasonable and prudent measure #4 (monitoring) the Corps shall:

***

d. Annually, submit a report that details Pacific City's operation plan, including peak demand, Horn Creek withdrawals, well field withdrawals, and duration of peak withdrawals.

e. Annually, for a period of 5 years, submit a report to NMFS that summarizes the results of the post-construction instream temperature monitoring, low flow habitat analysis, and the effectiveness of the installation of the large wood debris structures in creating pools and providing habitat and riparian planting survival.

f. As required by term and condition #2[3], submit a monitoring report detailing instream flow measures collected during periods of peak water withdrawals exceeding 2.0 cfs.

. . .

Biological Opinion, Attachment 1, p. 32

CONCLUSIONS

The applicant has demonstrated good cause for the permit extension pursuant to ORS 537.230, 539.010(5) and OAR 690-315-0080(3).

Based on the applicant's request, the Department has determined there is a reasonable basis to allow an additional five years for the extension period.

Order

The extension of time for Application S-49201, Permit S-36881, therefore, is approved subject to conditions contained herein. The deadline for completing construction is extended from October 1, 1990 to October 1, 2025. The deadline for applying water to full beneficial use is extended from October 1, 1990 to October 1, 2025.

DATED: May 14, 2012

Dwight French, Water Right Services Division Administrator *for*
PHILLIP C. WARD, DIRECTOR

If you have any questions about statements contained in this document, please contact Ann Reece at (503) 986-0827.

If you have other questions about the Department or any of its programs, please contact our Water Resources Customer Service Group at (503) 986-0900.

Mailing List for Extension FO Incorporating Settlement Agreement Copies

Note: Include a copy of the "Important Notice" document along with the original copy of the Final Order Incorporating Settlement Agreement being sent to the permit holder.

FO Date: May 14, 2012 **Copies Mailed**

Application S-49201 **By:** Connie Vance
Permit S-36881 **On:** 5/22/2012

Original mailed to permit holder:

Pacific City Joint Water-Sanitary Authority
Attn: Tony Owen
P.O. Box 520
Pacific City, OR 97135

Copies sent to:

1. WRD - App. File S-49201/ Permit S-36881
2. WRD - Watermaster District 1, Greg Beaman
3. WRD – Lisa Jaramillo, Transfer and Conservation Services (for QM requiring Division 86 plan)
4. WRD - Support Staff, Salem...*Permit record update*

Fee paid as specified under ORS 536.050 to receive copy:

5. None

Receiving via e-mail (10 AM day of signature date)

6. None

Other

7. Martha Pagel, Schwabe Williamson & Wyatt, 530 Center St, Ste. 400, Salem, OR 97301
8. WaterWatch of Oregon, 213 SW Ash St., Ste. 208, Portland, OR 97204

CASEWORKER: PM

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to NMFS No:
2008/02002

May 20, 2009

Erik S. Petersen
U.S. Army Corps of Engineers
Portland District
P.O. Box 2946
Portland, Oregon 97208-2946

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Horn Creek Municipal Water Intake (HUC: 171002030210), Tillamook County, Oregon (Corps No.: NWP-2008-161)

Dear Mr. Petersen:

The enclosed document contains a biological opinion (Opinion) prepared by the National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) regarding the effects of the proposed issuance of a Department of the Army permit by the U.S. Army Corps of Engineers (Corps) to Pacific City under section 404 of the Clean Water Act. In this Opinion, NMFS concludes that the proposed action is not likely to jeopardize the continued existence of Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*) or result in the destruction or adverse modification of designated critical habitat for OC coho salmon.

As required by section 7(b) of the ESA, NMFS is providing an incidental take statement with the Opinion. The incidental take statement describes reasonable and prudent measures NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements that the Corps must comply with the reasonable and prudent measures. Incidental take from actions that meet these terms and conditions will be exempt from the ESA's prohibition against the take of listed species.

This document also includes the results of our analysis of the action's likely effects on EFH pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Since NMFS provided no conservation recommendations, a response is not required.

If you have questions regarding this consultation, please contact Robert Anderson, Fisheries Biologist in the Oregon Coast/Lower Columbia Branch of the Oregon State Habitat Office, at 503.231.2226.

Sincerely,

for Barry A. Thom
Regional Administrator

Endangered Species Act Section 7 Consultation Biological Opinion

and

Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation

Horn Creek Municipal Water Intake
(HUC: 171002030210)
Tillamook County, Oregon
(Corps No.: NWP-2008-161)

Lead Action Agency:	U.S. Army Corps of Engineers
Consultation Conducted By:	National Marine Fisheries Service Northwest Region
Date Issued:	May 20, 2008
Issued by:	for Barry A. Thom Regional Administrator
NMFS No.:	**2008/02002**

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INTRODUCTION

This document contains a biological opinion (Opinion) and incidental take statement prepared in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531, *et seq.*), and implementing regulations at 50 CFR 402. With respect to critical habitat, the following analysis relied only on the statutory provisions of the ESA, and not on the regulatory definition of "destruction or adverse modification" at 50 CFR 402.02.

The National Marine Fisheries Service (NMFS) also completed an essential fish habitat (EFH) consultation, prepared in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801, *et seq.*) and implementing regulations at 50 CFR 600.

The docket for this consultation is on file at the Oregon State Habitat Office in Portland, Oregon.

Background and Consultation History

On September 18, 2007, NMFS staff participated in a pre-project design and operations meeting and field visit on Pacific City's proposed water intake on Horn Creek.

On April 8, 2008, NMFS received a letter and biological assessment from the U.S. Army Corps of Engineers (Corps) requesting formal consultation pursuant to section 7(a)(2) of the ESA and EFH consultation pursuant to section 305(b)(2) of the MSA to issue a Department of the Army permit to Pacific City under section 404 of the Clean Water Act to authorize construction of a new municipal water intake on Horn Creek. In the letter, the Corps determined the proposed action was likely to adversely affect Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*) and designated critical habitat for OC coho salmon.

On May 22, 2008, NMFS contacted the applicant's representative (Parametrix) to discuss Pacific City's operational plan.

On May 27, 2008, NMFS staff was notified by the applicant's representative that construction was postponed until summer 2009 and they will be providing NMFS a revised operations plan.

Between July 17, 2008 and August 21, 2008, NMFS and the applicant's representative worked on the development of a low-flow study design.

On July 28, 2008, the applicant's representative notified NMFS that the Pacific City Joint Water-Sanitary Authority Board approved a plan to modify the operations plan and implement the low-flow study.

On November 5, 2008, NMFS received a copy of the Horn Creek low-flow habitat analysis based on the modified operations plan.

On November 13, 2008, NMFS and the applicant's representative discussed the results of the Horn Creek low-flow habitat analysis. The NMFS and the applicant agreed to replace

extrapolated flow data with field-generated data and implement the operations plan based on that data.

On November 24, 2008, NMFS received a copy of the final Horn Creek low-flow habitat analysis, and began preparation of its Opinion.

Purpose and Need. Population growth in Pacific City is currently about 4.2% per year and projected to double by 2023 (biological assessment). Continued growth will require Pacific City to redevelop its current water supply system's source, treatment, and transmission capacity. Based on projected future growth, the existing water supply source (a series of well fields plus three existing intake structures on Horn Creek) cannot meet future peak demands as existing infrastructure is outdated and in disrepair.

Pacific City currently has three intake diversion structures on Horn Creek with water rights totaling 2.7 cubic feet $^{sec\ -1}$ (cfs). The East intake diversion structure has a water right of 0.5 cfs and is located approximately 1.75 miles upstream of the new intake. The Main intake diversion structure has a water right of 0.2 cfs and is located approximately 2.25 miles upstream of the new intake. The existing Horn Creek infilitration intake has a water right of 2.0 cfs and is located near the new intake structure. The three water diversion structures have an existing water withdrawal capability of 2.7 cfs. Pacific City is proposing a maximum peak (daily peak) withdrawal of 1.9 cfs at the Horn Creek intake.

In addition to increasing capacity, a primary reason for this project is to provide a water source that is not susceptible to saltwater intrusion or to tsunamis. This also creates the need for two transmission pipelines to connect the new water supply/treatment system to Pacific City.

Description of the Proposed Action

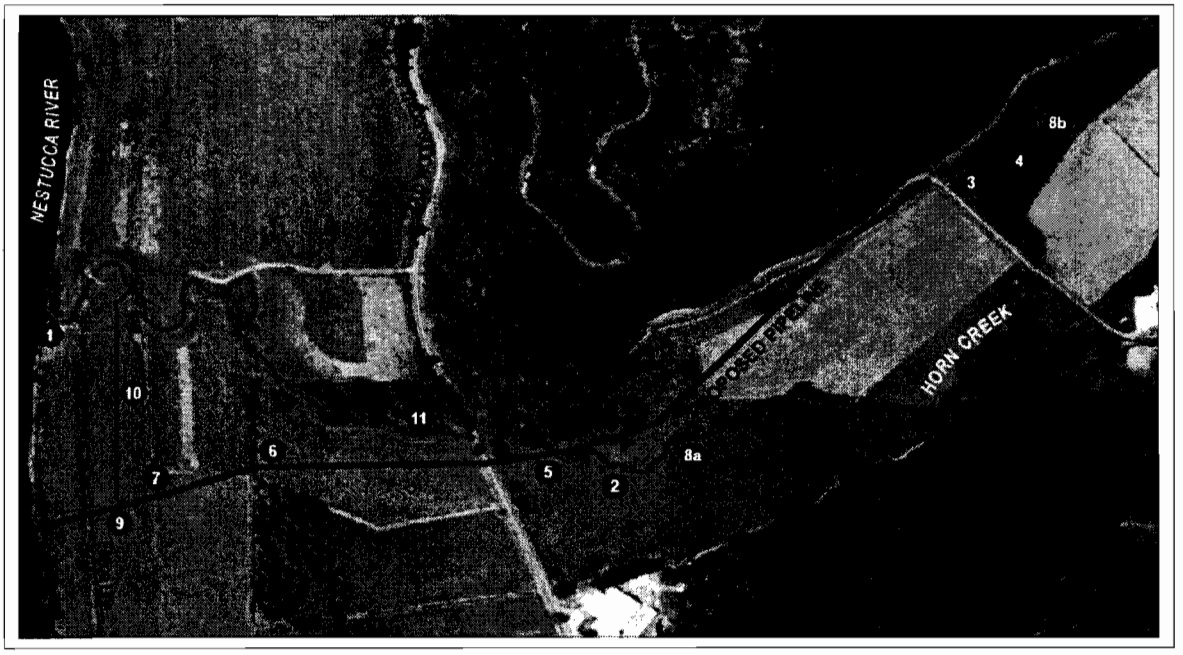
The proposed action is the issuance of a Department of the Army permit by the Corps under section 404 of the Clean Water Act authorizing Pacific City to construct a municipal water intake in Horn Creek, a tributary to the Nestucca River, in Pacific City, Tillamook County, Oregon.

Project Overview. Pacific City has water rights and existing intake structures on the surface water source Horn Creek that total 2.7 cfs. Pacific City proposes to consolidate these existing water rights so that a maximum withdrawal of 2.4 cfs could occur at the proposed Horn Creek intake. Pacific City also has water rights of 1.3 cfs that can be drawn from its well field as an alternative water source.

Intake Structure and Rock Weirs. The proposed intake structure will be located approximately 1.0 mile upstream from Horn Creek's confluence with the Nestucca River (Figure 1). The proposed structure will consist of a concrete box, approximately 8 feet long by 10 feet wide by 13 feet high that will house a passive drum screen (51 inches long by 16 inches in diameter connected to a 24-inch diameter PVC intake pipe. The intake screen will be an *active screen* (Johnson Model T-16 HCE intake screen) that will utilize compressed air from the treatment plant to automatically clean the screen on a regular interval (once daily). NMFS' maximum approach velocity criteria for this type of screen is 0.4 feet second^{-1}. This corresponds

to a minimum effective screen area of 6.7 feet squared for 1,200 gallons minute^{-1} (the maximum flow rate for the Horn Creek intake). The calculated effective screen area for this screen will be 7.0 square feet with a maximum approach velocity of 0.38 feet second^{-1}.

Figure 1. Overview of lower Horn Creek and project features.



LEGEND

1. Nestucca/Horn Creek confluence
2. Limits of tidal influence (Horn Creek)
3. Treatment facility location
4. Intake location
5. Horn Creek crossing
6. Canal crossing
7. Ditch crossing

8a. In-stream large wood (3 structures)
8b. In-stream large wood (2 structures)
9. Nestucca River boring
10. Temporary construction access road
11. Mitigation reference site

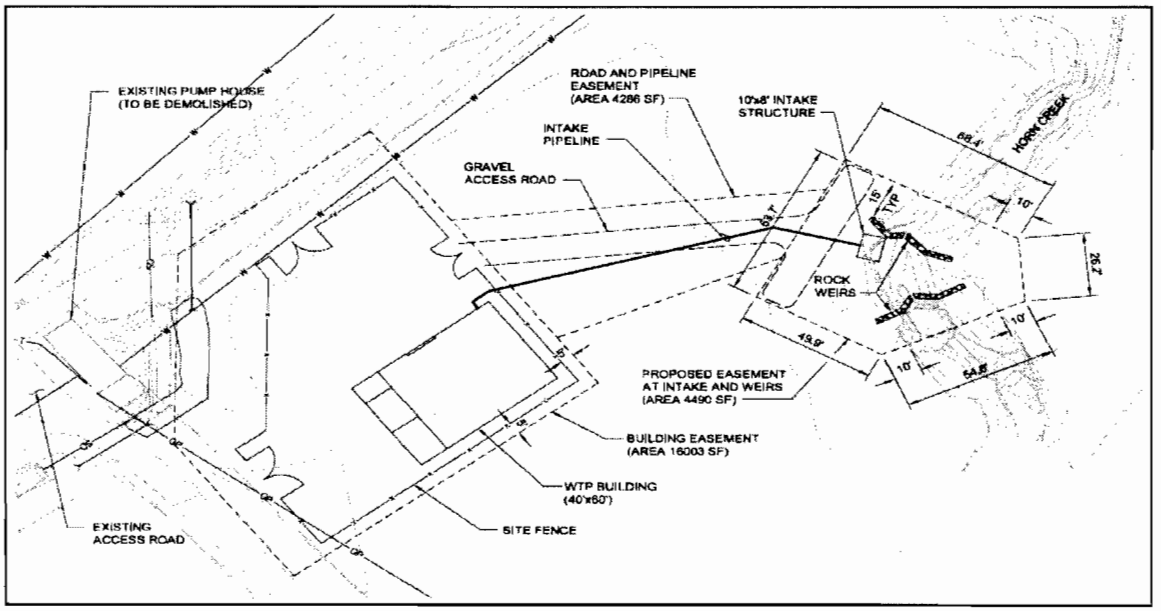
Installation of the concrete structure will occur along the west streambed/bank at an elevation that maintains a minimum water depth of 2.5 feet over the intake screen at 1.0 cfs. Approximately 1 foot of the intake structure will be above grade. The passive drum screen consists of a fine screen that excludes fish and other items greater than 0.06 inch in size. It also will have a weir and bar rack that excludes larger stream debris from entering the concrete structure. The buried intake pipe will run approximately 150 feet from the intake structure to the treatment/pumping facility.

The location proposed for this intake structure is within a right-bank scour pool. To maintain pool geometry, Pacific City will install two "v-shaped" rock weirs. The weirs will be comprised of hand-selected quarry boulders that are individually placed.

Construction of the intake will require permanent modification of approximately 15 linear feet of streambank on the west bank of Horn Creek. The intake structure will be placed on a pre-cast concrete pad and recessed into the streambank so that it extends a maximum of 1 foot into the existing stream channel. As a result, up to 15 square feet of the existing streambed will be permanently affected by the structure, and approximately 70 square feet of streambed will be affected by the weirs. A minimal amount of bank armoring, a maximum of 10 linear feet, will occur within the vicinity of the intake structure.

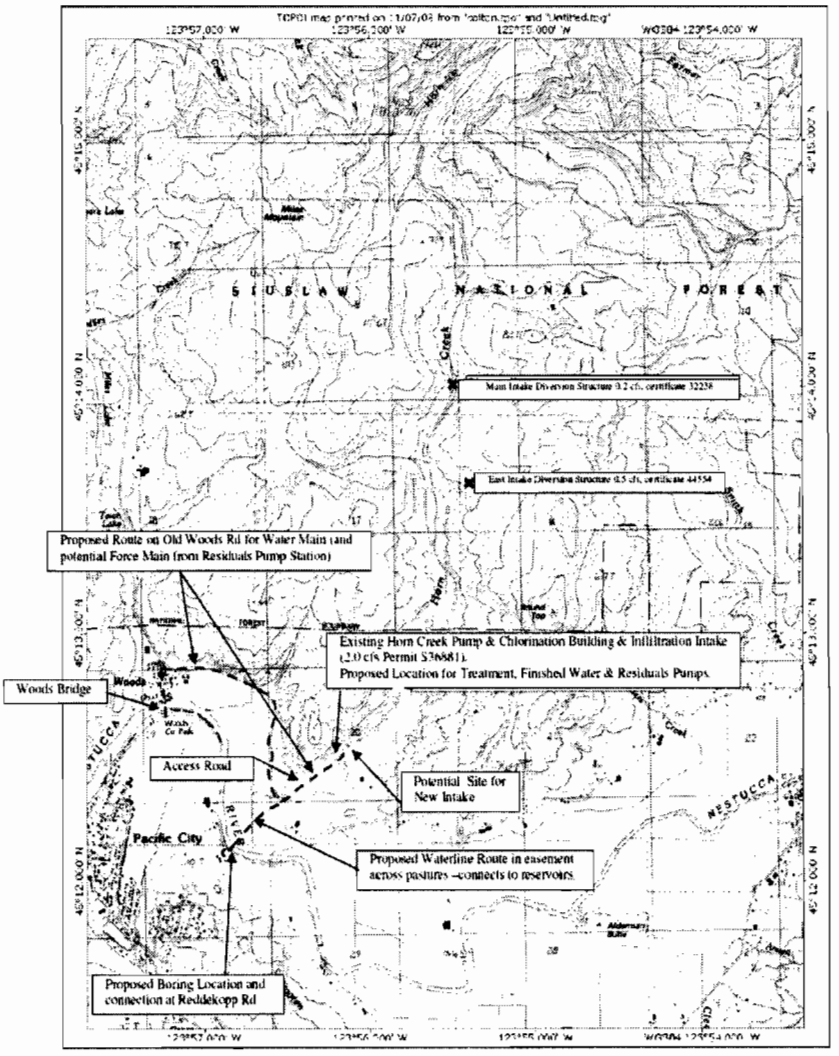
Treatment Facility/Pump Station. The new water treatment plant (WTP) will be built approximately 150 feet from Horn Creek, and includes a new 2,400 square foot building on a 16,000 square foot, fenced and graveled site to house the WTP and pumping systems (Figure 2). All stormwater generated by the new facility will infiltrate on site.

Figure 2. Site plan for the water treatment plant and intake.



Transmission Pipelines. To carry treated water from the Horn Creek WTP to Pacific City's existing distribution system, Pacific City will install two 12-inch diameter transmission pipelines. The proposed pipelines begin as one pipe that runs through pastureland (Figure 1 and Figure 3). The pipe crosses Horn Creek approximately 50 yards upstream from Old Woods Road within an existing easement and adjacent to the existing pipeline, and will be installed via an open trench and buried 4 feet below the creek bottom, or installed using horizontal directional drilling (HDD).

Figure 3. Topographic map showing existing water intake structures, the proposed new water intake, and proposed transmission lines.

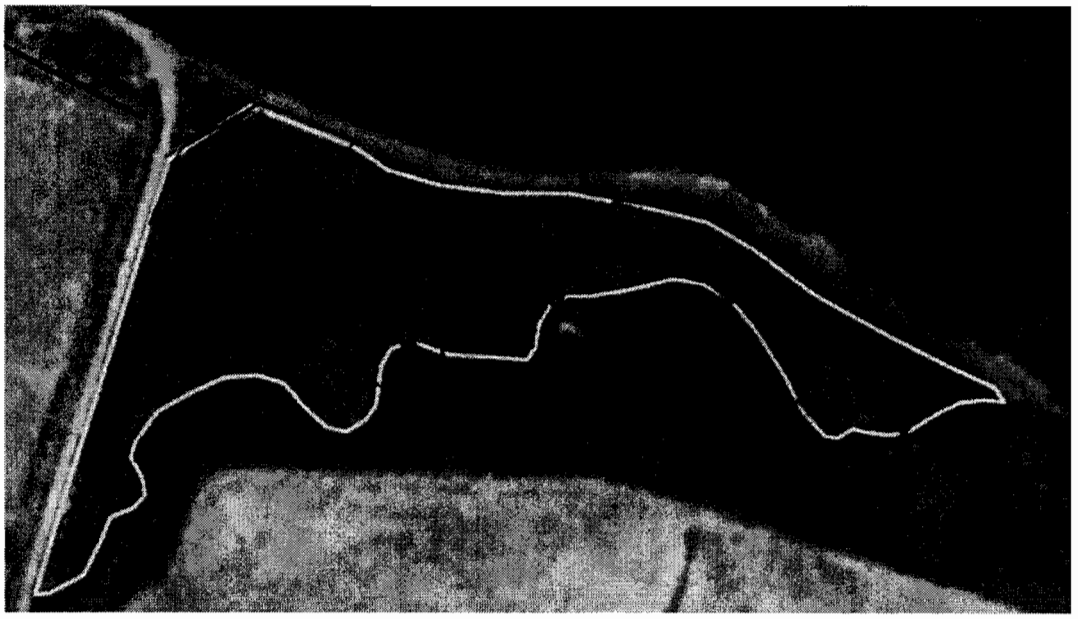


Upon reaching Old Woods Road (Figure 3), the pipe splits with one branch (South Pipeline) continuing southwest across another dairy pasture, crossing two drainage ditches located in the Nestucca River floodplain, crossing beneath the river, and connecting to the existing water system on the west side of the river. The South Pipeline's construction crossing of the Nestucca River will occur via HDD for a distance of approximately 300 feet at a depth of 30 feet below the river bottom. Using HDD will allow the crossing to occur without any work below the Nestucca River's ordinary high water elevation. The pipeline crossings of the two drainage ditches (no fish usage) will be by open trench.

The second pipe (West Pipeline) will run within the pavement/shoulder of Old Woods Road west to the town of Woods (Figure 3), then turn south to cross the Nestucca River by attaching the pipeline to the existing Woods Bridge. The West Pipeline will then connect into an existing transmission pipe in Brooten Road. The total length of the West Pipeline is approximately 1.6 miles. In addition to crossing the Nestucca River, the West Pipeline also will cross two small, unnamed Nestucca River tributaries. The pipeline will cross these streams embedded in the road; therefore, work outside of the existing road footprint or below the creeks' ordinary high water elevation will not be required. No in-water work will be required to cross the Nestucca River via the existing bridge.

Access/Storage Areas. Site location access will occur via existing paved and graveled roads within the project area. Staging areas for material storage will occur within disturbed, upland locations only. Maintenance, refueling, and vehicle storage will occur only on paved or graveled surfaces. All such areas will be fully contained via equipment diapers or other methods if located within 150 feet from riparian, aquatic, or wetland habitats (Figure 4).

Figure 4. Overview of the wetland and upland mitigation sites. The area in yellow is the wetland mitigation area. The area in green is the upland mitigation area.



Intake Operation and Management Plan. Based on the low-flow habitat analysis, Horn Creek has a minimum instream flow of 5.2 cfs (week of September 19, 2008). The Horn Creek WTP initially will withdraw a maximum of 1.5 cfs from Horn Creek (in 2009). However, the WTP's maximum design capacity will be 2.7 cfs, and ultimately, withdrawals on Horn Creek will increase to 2.7 cfs to meet future peak daily demand (Table 1). To meet peak daily demand during low flows, Pacific City will manage water supply demands by withdrawing water from both the Horn Creek water intake and its well field (its current water supply) which has a maximum capacity of 1.3 cfs. Tables 2 and 3 show how Pacific City proposes to use its two

sources to meet its municipal water demand over the next 9 years. Pacific City did not provide an operations plan for water withdrawals at the Horn Creek intake beyond 2018.

Table 1. Future municipal water demand estimates (biological assessment).

Year	Annual Max Daily Demand (cfs)
2008	1.5
2013	2.0
2018	2.4
2023	3.0
2028	3.5

Table 2. Horn Creek operations plan for 2009.

Month	Peak Demand	Horn Creek Withdrawal	Well Field Withdrawal	Observed Average Monthly Flow 2008
Jan	0.7	0.7	0	
Feb	0.7	0.7	0	
Mar	0.8	0.8	0	
Apr	0.9	0.9	0	
May	0.9	0.9	0	
Jun	1.0	1.0	0	
Jul	1.5	1.5	0	13.1
Aug	1.5	1.0	0.5	10.7
Sep	1.1	0.6	0.5	5.9
Oct	0.8	0.8	0	
Nov	0.6	0.6	0	
Dec	0.6	0.6	0	

Table 3. Horn Creek operations plan for 2018.

Month	Peak Demand	Horn Creek Withdrawal	Well Field Withdrawal	Observed Average Monthly Flow 2008
Jan	1.1	1.1	0	
Feb	1.0	1.0	0	
Mar	1.3	1.3	0	
Apr	1.4	1.4	0	
May	1.4	1.4	0	
Jun	1.6	1.6	0	
Jul	2.4	1.9	0.5	13.1
Aug	2.4	1.0	1.4	10.7
Sep	1.7	0.6	1.1	5.9
Oct	1.3	1.3	0	
Nov	1.0	1.0	0	
Dec	1.0	1.0	0	

Future habitat monitoring efforts will occur for 5 years post-construction to assess instream depth and temperature at a variety of flow rates, refine hydraulic model results, and calibrate the hydraulic model for future efforts.

A programmable logic controller (PLC) will automatically operate all aspects of the WTP, including the pumps that are fed by the intake. The water elevation of Horn Creek will be monitored continuously by a level sensor at the intake structure. The level sensor will send signals to both the PLC that controls the WTP (and intake pumps) and to computers and alarms at the Pacific City administration building. The PLC at the WTP will instantaneously stop the intake pumps if levels in Horn Creek fall below an elevation corresponding to the 2.5 cfs low-flow threshold. This will allow closer monitoring of the creek, the watershed, and the WTP system. Management actions might include reductions in withdrawals from Horn Creek, start-up of the well field, and notification of regulatory agencies.

Discharge of Treatment Backwash. Based on information from the applicant, the microfiltration system to be used to treat water requires that the filters be cleaned on a routine basis. The water resulting from these cleaning cycles is called backwash. There are three types of backwash that will be treated and neutralized before being discharged to the vegetated ditch (no fish usage).

The first type of treatment involves routine backwashes occurring about every 20 minutes, does not involve the use of chemicals, and is treated in a settling tank to remove any settable solids prior to discharge.

The second type of treatment is enhanced maintenance. This occurs once per day and involves cleaning the membranes with hypochlorite and hot water. This water is treated with sodium bisulfite for dechlorination and sodium carbonate to adjust the pH in a neutralization tank. Because the volume of water produced in this stage is about 5% of the total volume of the

routine backwashing, the water is diluted and temperature-equalized. Then it is transferred into the settling tank prior to discharge.

The third type of treatment occurs approximately once per month and requires extensive cleaning of the filters. This involves a multi-step process using sodium hypochlorite, citric acid, calcium bisulfate, and sodium hydroxide. The water produced from this treatment will run through a neutralization tank to be dechlorinated and to adjust the pH to background. The water is then transferred to a settling tank prior to discharge to a 1,500 foot-long vegetated ditch that eventually connects to Horn Creek. Average backwash at peak water demand will be 0.12 cfs.

The vegetated ditch receives drainage from the hills to the west. The ditch travels south along the access road for 1,500 feet from the proposed treatment plant to Horn Creek. In practical terms, the volume of water discharged into this ditch will infiltrate into ground before it travels the 1,500 feet in the vegetated ditch and reaches Horn Creek, as the ditch would act like a bioswale and provide added natural treatment: swales provide solids removal, organic removal, nutrient removal, and inorganics adsorb onto the soil and grasses.

Calcium bisulfate will be used for dechlorination. Calcium bisulfate is a reducing agent added proportionally to remove chlorine (an oxidizing agent). The two combine and neutralize each other, *i.e.*, deionize and dissipate and will be diluted to undetectable levels. There is also 28 hours of detention time in the neutralization tank and 3.5 hours in settling tank on an average day.

All chemical properties/by-products from chemical treatment is dealt with in the tanks settling tank and by-products are not discharged but remain in the tank. Pacific City is proposing a zero concentration target for chlorine. On-line analyzers will trigger an alarm if chlorine is detected in the discharge and discharge to the vegetated drainage ditch will stop.

Maintenance. Maintenance activities at the Horn Creek WTP intake will include:

1. Cleaning of the passive intake screen will occur daily by air-sparging using pressurized air.
2. Sediment accumulating in the intake structure will require periodic removal. The intake structure will be isolated by installing stop logs and dewatered using a portable pump with appropriately screened intake to exclude fish.
3. As the water is drawn down within the intake, fish will be periodically removed using nets. All fish will be removed prior to complete dewatering.

Impact Minimization Measures -- Short-term (Construction). The applicant proposes the following measures to minimize environmental impacts:

In-Water Work. All in-water work will occur during the ODFW-approved in-water work period of July 1 through September 15. The active work area will be isolated and dewatered, to the greatest extent possible, from the flowing stream with sandbags, cofferdams, a diversion pipe, pumps, and/or similar structures (Figure 5). The work area will be isolated primarily using gravity flow. However, intermittent pumping will be required to remove water that seeps into

the work area and when the gravity diversion structure is being readjusted and/or during rock weir construction. All pumps will be appropriately screened to exclude fish and will be manned continuously during operation. Machinery will be operated below the OHW elevation only within isolated portions of the stream. Machinery will not be operated within actively flowing portions of the channel.

Experienced biologists will perform all fish salvage and isolation activities. Fish salvage methods will be chosen based on site-specific conditions and may include such techniques as electrofishing, seining, and/or dip netting.

After completion of the project, permanent stabilization methods (to address alterations of the streambank during project work) will include seeding and mulching, protection with river rock (boulders), and/or bioengineered slope stabilization.

Rock will be placed individually and not end dumped. Placement will occur in the dry as much as possible. Rock placed within the bank or streambed will be clean of soil and other pit-run type sediments.

The contractor will measure for turbidity every 4 hours and will limit increases to 10% above background levels as observed 100 feet below the project.

Large woody debris will be installed in summer 2009 and will occur during the July 1 through September 15 in-water work period.

Sediment and Erosion Control. Soils that are temporarily exposed and disturbed during construction-related activities will be treated to minimize sediment mobilization using various methods (*e.g.*, silt fencing, straw bales, temporary seeding and/or mulching) and the erosion control methods will remain in place until the disturbed soils are stabilized, as determined by the project engineer.

Temporary sediment controls, such as sediment mats, filter bags, erosion blankets, sediment traps, staked sediment barriers, water bladderdams, and/or "dirt bags," will be constructed and used as necessary to limit sediment inputs to Horn Creek, the Nestucca River (if necessary), and surrounding wetlands.

Monitoring of erosion and sediment control measures will take place weekly by the construction contractor and the project engineer. It also will occur during major storms (during active construction periods only).

Any excess material will be removed from channels after operations are completed. No material that could contribute sediment to downstream habitats will be deposited below the bank or in waterways or wetlands.

Spill Prevention. The spill prevention plan will include the following items: Notification procedures; specific cleanup and disposal instructions for different products, quick response

containment and cleanup measures that will be available on site, and employee training for spill containment.

Prior to operating within the streams or wetlands, all equipment will be cleaned of external oil, grease, dirt, or caked mud. Any washing of equipment will be conducted in a location that will not contribute untreated wastewater to any flowing stream or wetland. On a daily basis, vehicles will be examined for fluid leaks prior to entering work areas near/within streams and wetlands. Staging areas will be located in areas that will prevent the potential contamination of any wetland or waterbody. Maintenance, refueling, and vehicle storage will occur only on paved or graveled surfaces. All such areas will be fully contained via diapers or other methods if not located at least 150 feet from riparian, aquatic, or wetland habitats.

If equipment leaks occur during in-water work, the equipment will be removed from the stream and/or wetland immediately to a location where pollutants cannot enter any waterway. The equipment will not be allowed within the stream and/or wetland until all leaks have been corrected and the equipment cleaned. Upland areas where the leaking equipment is stored also will be cleaned/remediated prior to project completion.

Temporary Work Access. Temporary work access areas will be limited to essential vehicles and personnel to minimize ground disturbance and soil erosion. Although site access for construction equipment primarily will occur during summer when access routes are dry and vegetated, should damage to these routes occur (in the form of ruts), they will be protected using appropriate materials (*e.g.*, geo-textile fabric and clean aggregate), which will be removed upon completion of the maintenance activities.

Upon completion of construction, all access areas not required for long-term maintenance will be blocked from all vehicular traffic and replanted with native species.

Clearing and Grubbing. Removal of native vegetation 4 inches or greater in diameter at breast height within riparian areas will not be allowed.

Impact Minimization Measures — Long-term (Operation and Maintenance).

Sediment Removal. When sediment accumulates in the intake structure to the point that it requires removal, the intake structure will be isolated by installing stop logs and dewatered using a portable pump with an appropriately screened intake to exclude fish. As the water is drawn down within the intake, fish will be periodically removed using nets. All fish will be removed and placed either upstream or downstream prior to complete dewatering.

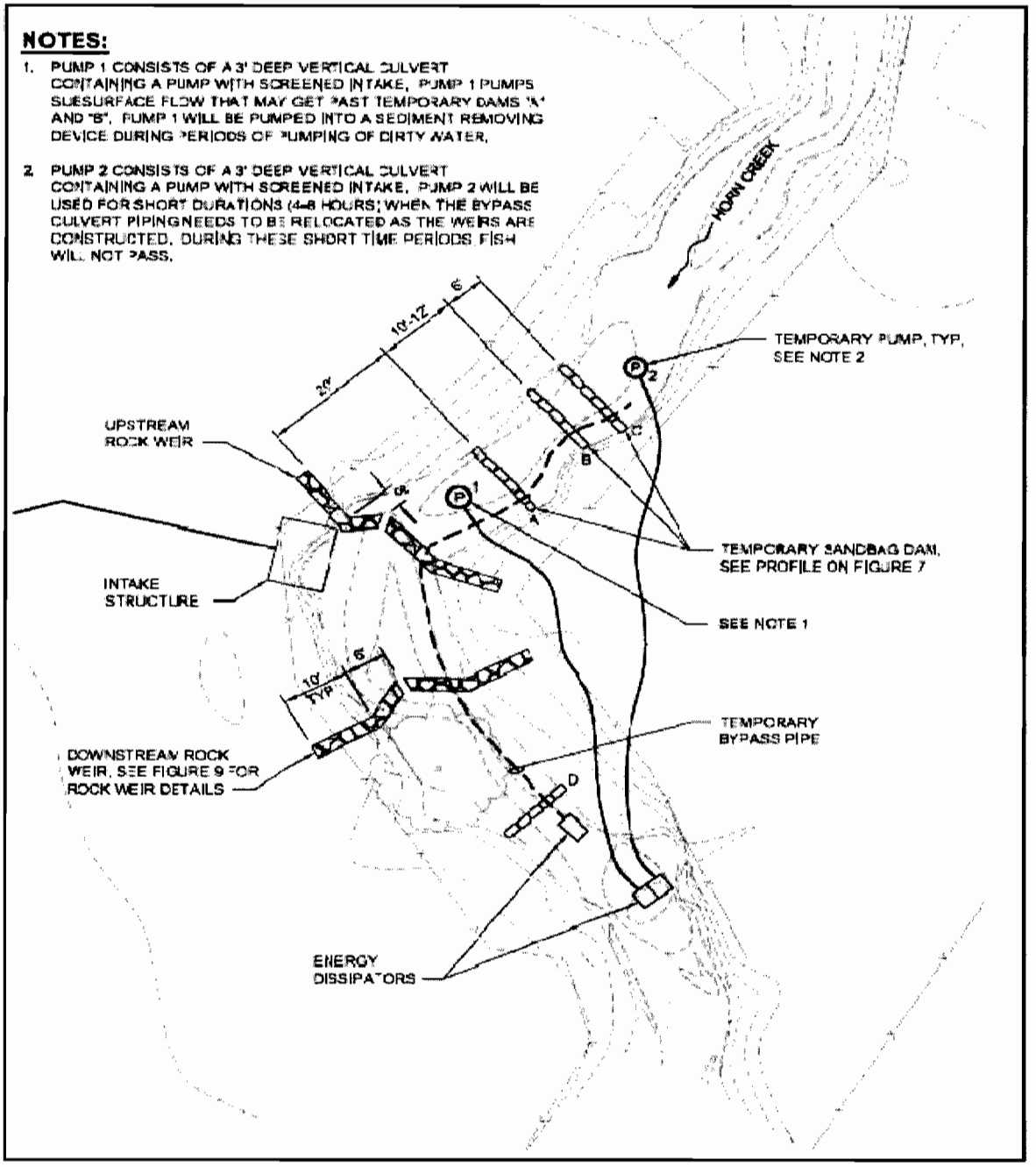
Fish Entrapment in the Intake Structure. Fish may become trapped in the intake structure if the water surface in Horn Creek drops below the elevation of the intake. The intake's elevation will be adjusted (using stop logs) in response to stream levels. However, the minimum elevation of the intake will be lower than the streambed, therefore minimizing the likelihood for entrapment.

Fish may become trapped in the intake under two scenarios:

Scenario 1. If water levels dropped below the level of the highest stop log, fish may become trapped. However, this situation will be detected immediately by a continuously operating ultrasonic level sensor at the intake which monitors water levels. When stream levels fall below a set elevation, the pumping system will automatically shut down (to protect equipment). Pacific City staff will immediately remove a stop log and resume pumping. To prevent this from occurring when the system is not active, if flows drop below the minimum instream flow threshold of 2.5 cfs the Pacific City will not withdraw water from Horn Creek until creek levels rise and instream flows exceed 2.5 cfs.

Scenario 2. Fish could become trapped during extremely low flows. However, this is unlikely to occur, because during extreme low flows, the system will have been shut down, all stop logs will have been removed, and the inlet weir (which will be lower than the elevation of the stream when all stop logs are removed) will be the controlling intake elevation. Therefore, the portion of the channel located adjacent to the intake will have to go dry in order to strand fish in the intake. This is unlikely to occur as the thalweg is very close to the intake and likely will remain so due to construction of the rock weir, which will help maintain the pool's current geometry. Therefore, surface flow in Horn Creek will have to drop very close to zero cfs in order to completely disconnect the intake from active stream flow. To prevent this from occurring, when flows drop below the specified threshold of 2.5 cfs (minimum instream flow with maximum water withdrawal) Pacific City will monitor instream water levels daily to ensure they do not drop below the intake. Should surface flow in the creek become disconnected from the intake, Pacific City agrees to contact NMFS and ODFW to determine the appropriate course of action.

Figure 5. Stream dewatering plan for Horn Creek.



Temperature Monitoring. Pacific City proposes to repeat the stream temperature monitoring (refer to Low Flow Habitat Analysis for methodology) for the first five years of operation to assess effects of flow reductions in Horn Creek.

Mitigation. Pacific City proposes to partner with the Nestucca Watershed Council to install five large woody debris (LWD) structures in Horn Creek with two structures immediately upstream of the new intake and three structures downstream of the new intake and above head of tide (see mitigation plan). Each LWD structure will have 2 to 5 logs per structure. The LWD structures will be installed in summer 2010. Large woody debris will be conifers (most likely Douglas-fir and spruce) with a minimum diameter at breast height of 18 inches and a minimum length of 20 feet, with attached root wads. Due to potential presence of chum salmon, the structures will not span more than 50% of the channel, but rather will extend 3 feet to 6 feet from the bank into the stream, providing edge effect and creating scour pools, and perhaps plunge pools as well. The average size of pools created will be in the range of 10 feet long by 5 feet wide by 3 feet deep.

Pacific City also proposes to replant approximately 11,400 square feet of riparian forest along approximately 500 linear feet of Horn Creek (see mitigation plan). The entire replanted area will be located within the action area, immediately downstream from the proposed intake. These plantings will provide shade to the creek, which is currently lacking in most of the action area, therefore helping to moderate instream temperatures.

To offset wetland and upland impacts, Pacific City proposes to enhance 65,859 square feet of wetland habitat and 13,640 square feet of upland habitat (Figure 4 and Table 8).

NMFS relied on the foregoing description of the proposed action, including all minimization and mitigation measures, to complete this consultation. To ensure that this consultation remains valid, the Corps should keep NMFS informed of any changes to the proposed action.

Construction and Monitoring Schedule. Table 4 shows the proposed schedule for construction, maintenance, and monitoring over the next 5 years.

Table 4. Proposed schedule for construction and monitoring.

YEAR	SEASON	ACTIVITY
1 (2009)	Summer	Intake and pipeline construction
1	Fall-Winter	Weed control as necessary
1	Fall - Winter	Tree and shrub plantings
2 (2010)	Spring - Fall	Site maintenance (including weed control) as necessary
2	Late Spring	1st annual monitoring
2	Early Summer	Instream structure construction; as-built report preparation
2	Summer	Site maintenance (including weed control) as necessary
2	Fall	Replanting/corrective action as necessary
2	Early winter	1st annual monitoring report
3 (2011)	Late spring	2nd annual monitoring
3	Summer	Site maintenance (including weed control) as necessary
3	Fall	Replanting/corrective action as necessary
3	Early winter	2nd annual monitoring report

YEAR	SEASON	ACTIVITY
4 (2012)	Late spring	3rd annual monitoring
4	Summer	Site maintenance (including weed control) as necessary
4	Fall	Corrective action as necessary
4	Early Winter	3rd annual monitoring report
6 (2013)	Late spring	4th annual monitoring
6	Summer	Site maintenance (including weed control) as necessary
6	Fall	Corrective action as necessary
6	Early winter	4th annual monitoring report
8 (2014)	Late Spring	5th (final) annual monitoring
8	Summer	Site maintenance (including weed control) as necessary
8	Fall	Corrective action as necessary
8	Early winter	5th (final)annual monitoring report

Action Area

'Action area' means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area for the project serves as a migration corridor for both adult and juvenile anadromous salmonid fishes, and as rearing habitat for juvenile anadromous salmonid fishes.

The proposed action occurs in Township 4 south, Range 10 west, Section 20, southwest 1/4 of the northeast 1/4) (Figure 2). The action area is defined as Horn Creek from its confluence with the Nestucca River to stream mile 1.25, including a 150-foot area measured out from top-of-bank; the Nestucca River at river mile 2.75 from bank-to-bank; and a 100-foot wide area, measured from centerline, of the proposed routes of the transmission lines (Figure 2).

ENDANGERED SPECIES ACT

Section 7(a)(2) of the ESA requires Federal agencies to consult with NMFS to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. The Opinion that follows records the results of the interagency consultation for this proposed action. An incidental take statement (ITS) is provided after the Opinion that specifies the impact of any taking of threatened or endangered species that will be incidental to the proposed action, reasonable and prudent measures that NMFS considers necessary and appropriate to minimize such impact, and nondiscretionary terms and conditions (including, but not limited to, reporting requirements) that must be complied with by the Federal agency to carry out the reasonable and prudent measures.

Biological Opinion

To complete the jeopardy analysis presented in this Opinion, NMFS reviewed the status of the listed species[1] of Pacific salmon considered in this consultation (Oregon coastal coho salmon), the environmental baseline in the action area, the effects of the action, and cumulative effects (50 CFR 402.14(g)). The NMFS determined whether effects of the action were likely, in view of existing risks, to appreciably reduce the likelihood of both the survival and recovery of the affected listed species.

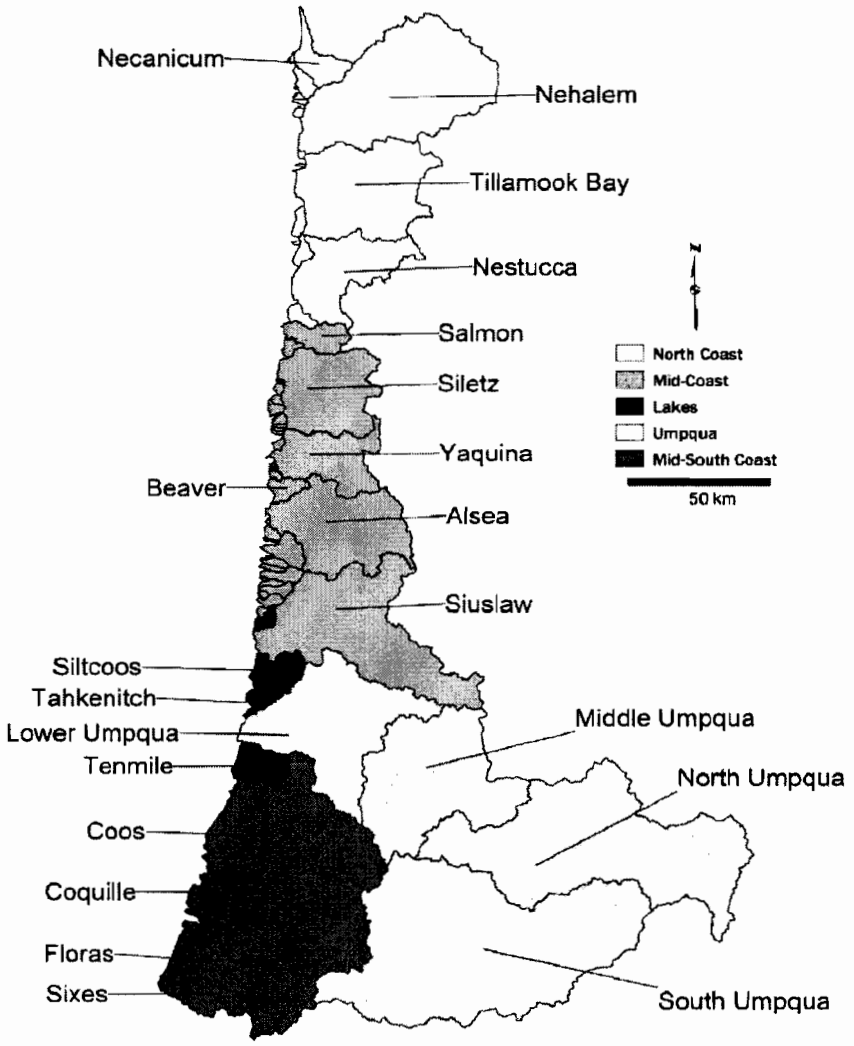
For the critical habitat adverse modification analysis, NMFS considered the status of the entire designated area of the critical habitat considered in this consultation, the environmental baseline in the action area, the likely effects of the action on the function and conservation role of the affected critical habitat, and cumulative effects. The NMFS used this assessment to determine whether, with implementation of the proposed action, critical habitat (entire designation) will remain functional, or retain the current ability for the primary constituent elements (PCEs) to become functionally established, to serve the intended conservation role for the species (Hogarth 2005).

Status of the Species and Critical Habitat

Status of the Species. OC coho salmon includes all naturally-spawned populations of coho salmon in Oregon coastal streams south of the Columbia River and north of Cape Blanco, and the progeny of five artificial propagation programs. The OC coho salmon Technical Recovery Team (OC-TRT) identified 56 historical populations, grouped into five major "biogeographic strata," based on consideration of historical distribution, geographic isolation, dispersal rates, genetic data, life history information, population dynamics, and environmental and ecological diversity (Figure 6) (Lawson *et al.* 2007).

[1] An "evolutionarily significant unit" (ESU) of Pacific salmon (Waples 1991) and a "distinct population segment" (DPS) of steelhead (71 FR 834; January 5, 2006) are both "species" as defined in Section 3 of the ESA.

Figure 6. Biogeographic strata and independent populations of the OC coho salmon ESU.



Historical populations can be classified based on their ability to persist in isolation over time McElhaney *et al.* 2000). Historical populations of OC coho salmon were separated into three categories by Lawson *et al.* (2007) based on their relative persistence and degree of isolation. The definitions for these three categories are as follows:

> **Functionally independent populations:** high-persistence populations whose population dynamics or extinction risk over a 100-year time frame is not substantially altered by exchanges of individuals with other populations. These populations are net "donor" populations that may provide migrants for other types of populations.
>
> **Potentially independent populations:** high-persistence populations whose population dynamics may be substantially influenced by periodic immigration from other populations. In the event of the decline or disappearance of migrants from other

populations, a potentially independent population could become a functionally independent population.

Dependent populations: low-persistence populations that rely upon immigration from other populations. Without these inputs, dependent populations will have a lower likelihood of persisting over 100 years. They are "receiving" populations that are dependent on sufficient immigration from surrounding populations to persist.

The Nestucca population is the only population occurring in the action area. This population occurs within the North Coast biogeographic strata of the ESU (Table 5). The Nestucca population is a functionally independent population (Lawson *et al.* 2007).

Table 5. OC coho salmon populations in North-Coast stratum in Oregon based on Lawson *et al* (2007). The highlighted population occurs in the action area.

	Population Type		
Population Name	**Functionally Independent**	**Potentially Independent**	**Dependent**
North Coast Stratum			
Necanicum		X	
Ecola			X
Arch Cape			X
Short Sands			X
Nehalem	X		
Spring			X
Watseco			X
Tillamook	X		
Netarts			X
Rover			X
Sand			X
Nestucca	X		
Neskowin			X

The OC-TRT concluded that, if recent past conditions continue into the future, OC coho salmon are moderately to highly certain to persist over a 100-year period without artificial support, but have a low to moderate certainty of being able to sustain their genetic legacy and long-term adaptive potential for the foreseeable future (Wainwright *et al.* 2008). The weakest biogeographic strata in the OC-TRT assessment were the North Coast and Mid-Coast, which had only a low certainty of being persistent and sustainable. The factors limiting recovery of OC coho salmon include altered stream morphology, reduced habitat complexity, loss of overwintering habitat, excessive sediment, high water temperature, and variation in ocean conditions (NMFS 2006).

Status of Critical Habitat. The NMFS reviews the status of designated critical habitat affected by the proposed action by examining the condition and trends of primary constituent elements (PCEs) of critical habitat that are present throughout the designated area. The PCEs consist of the physical and biological features identified as essential to the conservation of the

listed species in the documents that designate critical habitat (50 CFR 424.12(b)). The PCEs present in the action area are displayed in Table 6.

Table 6. Primary constituent elements of critical habitat designated for OC coho salmon within the action area and corresponding life history events.

Primary Constituent Elements		**Species Life History Event**
Site Type	***Site Attribute***	
Freshwater rearing	Floodplain connectivity Forage Natural cover Water quality Water quantity	Fry emergence Fry/parr growth and development
Freshwater migration	Free of artificial obstructions Natural cover Water quality Water quantity	Adult sexual maturation Adult upstream migration Fry/parr seaward migration

Climate Change. Climate change is likely to have negative implications for the conservation value of designated critical habitats in the Pacific Northwest (CIG 2004, Scheuerell and Williams 2005, Zabel *et al.* 2006, ISAB 2007). Average annual Northwest air temperatures have increased by approximately 1°C since 1900, or about 50% more than the global average warming over the same period (ISAB 2007). The latest climate models project a warming of 0.1 to 0.6°C per decade over the next century. According to the ISAB, these effects may have the following physical impacts within the next forty or so years:

> Warmer air temperatures will result in a shift to more winter/spring rain and runoff, rather than snow that is stored until the spring/summer melt season.
>
> With a shift to more rain and less snow, the snowpacks will diminish in those areas that typically accumulate and store water until the spring freshet.
>
> With a smaller snowpack, these watersheds will see their runoff diminished and exhausted earlier in the season, resulting in lower streamflows in the June through September period.
>
> River flows in general and peak river flows are likely to increase during the winter due to more precipitation falling as rain rather than snow.
>
> Water temperatures will continue to rise, especially during the summer months when lower streamflow and warmer air temperatures will contribute to the warming regional waters.

These changes will not be spatially homogeneous across the entire Columbia River basin. Areas with elevations high enough to maintain temperatures well below freezing for most of the winter and early spring would be less affected. Low-lying areas that historically have received scant precipitation contribute little to total streamflow and are likely to be more affected. The ISAB also identified the likely effects of projected climate changes on Columbia basin salmon. These long-term effects may include, but are not limited to, depletion of cold water habitat, variation in quality and quantity of tributary rearing habitat, alterations to migration patterns, accelerated embryo development, premature emergence of fry, and increased competition among species.

Areas, such as the watersheds along the Oregon coast, are less likely to be subject to some of these projected climate changes as stream along the Oregon coast are not snowpack-dependent. Some areas, however, may experience changes in sea level or become subjected to more frequent and intense flooding.

Environmental Baseline for the Action Area

The 'environmental baseline' includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impacts of state or private action which area contemporaneous with the consultation in process (50 CFR 402.02).

Pacific City currently has three intake diversion structures on Horn Creek with water rights totaling 2.7 cfs. The East intake diversion structure has a water right of 0.5 cfs and is located approximately 1.75 miles upstream of the new intake. The Main intake diversion structure has a water right of 0.2 cfs and is located approximately 2.25 miles upstream of the new intake. The existing Horn Creek infilitration intake has a water right of 2.0 cfs and is located near the new intake structure. The three water diversion structures have an existing water withdrawal capability of 2.7 cfs. Pacific City is proposing a maximum peak (daily peak) withdrawal of 2.7 cfs at the Horn Creek intake.

The biological assessment uses habitat indicators to describe the baseline condition of components of most of the PCEs; ratings for these habitat indicators are provided in Table 7.

Table 7. Environmental baseline conditions for the action area.

Habitat Indicator	Environmental Baseline Condition Category[1]		
	PF	FAR	NPF
Non-Watershed Indicators			
Temperature	X		
Sediment/Turbidity			X
Chemicals/Nutrients	X		
Physical Barriers	X		
Substrate Character			X
Large Woody Material			X
Pool Frequency and Quality		X	
Large Pools			X
Off-channel Habitat			X
Refugia			X
Width:Depth Ratio	X		
Streambank Condition			X
Floodplain Connectivity		X	
Change in Peak/Base Flows		X	
Drainage Network Increase		X	
Watershed Condition Indicators			
Road Density & Location		X	
Disturbance History			X
Riparian Reserves			X

PF = Properly functioning, FAR = functioning at risk, and NPF = not properly functioning

Low-Flow Habitat Analysis. In the summer of 2008, Parametrix conducted a low-flow habitat analysis of Horn Creek's physical habitat and thermal regime to provide information on existing conditions, and to provide a baseline to assess potential future effects associated with Pacific City's water withdrawals in Horn Creek.

Based on the steam temperature data provided in Appendix A, NMFS calculated the equivalent-constant stream temperatures, a derivation of the 7 day average of the daily maxima and the weekly mean high temperature, for Horn Creek of 15°C (intake) and 15.7°C (downstream), respectively.

NMFS also assessed the stream profile data in the low flow habitat analysis to determine effects on instream habitat (Appendix A).

Effects of the Action

'Effects of the action' means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Effects of

the action that appreciably reduce the ability of a listed species to meet its biological requirements may increase the likelihood that the proposed action will result in jeopardy to that listed species or in destruction or adverse modification of a designated critical habitat.

Effects on Habitat. NMFS expects construction-associated effects (*i.e.*, construction of the intake structure and rock weirs; treatment facility/pump station; transmission pipelines; short-term impact minimization measures; wetland impacts; wetland mitigation; and installation of large woody debris structures and riparian planting) on instream and upland habitats to be insignificant. Likewise, NMFS expects discharge of treatment backwash and post-construction, water withdrawals to be insignificant, and therefore are not likely to adversely affect OC coho salmon. The following is a discussion of each project element and the rationales supporting our effects determinations.

Intake Structure and Rock Weirs. NMFS expects effects from installation of the intake structure and rock weirs to be insignificant as all work below top-of-bank will take place within a temporary cofferdam. By confining in-water work within the cofferdam, disturbance to the stream channel as a whole is likely to be minimal. Effects on water quality, such as suspended sediment, will be minor as impacts will not go beyond the confines of the cofferdam. Post construction, the intake structure or rock weirs will not meaningfully alter channel geometry. The intake structure will have minimal impact on the channel area, and the engineering of the rock weirs will maintain channel geometry and streambed stability minimizing head-cutting or down-cutting.

Treatment Facility/Pump Station. NMFS expects effects from construction of the treatment facility/pump station to be insignificant as these features are located in an upland area approximately 150 feet from top-of-bank. The topography in this area is flat, and proposed impact minimization measures for construction will reduce the likelihood for sediment to enter Horn Creek.

Installation of Transmission Pipelines. NMFS expects effects from installation of the transmission pipelines to be insignificant as transmission pipelines will be installed mostly in pastureland and along and within the road prism of Old Woods Road with little chance of stream disturbance. Where the transmission pipelines intersect waterways, they will be installed underneath the Nestucca River using directional boring avoiding impacts to channel morphology and the waterway substrates. For Horn Creek, transmission pipelines will be installed via open trench or directional boring. If the transmission pipelines are installed via open trench in Horn Creek, NMFS expects habitat-related effects to be similar to those described above under *Intake Structure and Rock Weirs.*

Short-term Impact Minimization Measures and Installation of Large Woody Debris and Riparian Planting. Instream flow will be routed around the construction area and discharged immediately downstream of the cofferdam as to minimize disruption of downstream flows. Although, installation of large woody debris into the stream channel and streambanks of Horn Creek will cause localized disturbance, effects such as increased sediment yields and associated increases in turbidity will be minor in duration and magnitude. In the long term, installation of large woody debris and riparian plantings will improve localized, instream and

riparian functions, *e.g.*, creation of pools, sediment retention, streambank stability, and canopy cover. Therefore, NMFS expects effects from impact minimization measures and installation of large woody debris and riparian plantings to be insignificant.

Wetland Impacts and Wetland Mitigation. NMFS expects effects to wetland impacts (Table 8) to be insignificant on stream functions as the wetlands are not within the channel prism of Horn Creek. Although these wetlands are connected hydrologically to Horn Creek, they are not likely to negatively alter groundwater-stream exchange or hyporheic flow because wetland impacts will be temporary. In the long term, the proposed wetland mitigation will increase the overall square footage of wetlands potentially improving wetland-stream hydrologic functions in Horn Creek. Pacific City proposes to use no herbicides within 100 feet of Horn Creek or the Nestucca River. If Pacific City applies herbicides outside this 100 foot zone. The NMSF does not expect effects on instream or riparian function. Listed in Table 8 are the impacts associated with construction of the Horn Creek intake.

Table 8. Summary of wetland and instream impacts associated with the Horn Creek intake and proposed mitigation.

Permanent Impacts

Wetlands	Acres	Removal/Fill (cy)	Cause
Submitted	0.56	1906/2106	
Change	*0.004*	*28/28*	Utility vaults
Change	*0.034*	*0/140*	Facility footprint recalculation
Revised Final	**0.598**	**1934/2274**	

Temporary Impacts

Wetlands	Acres	Removal/Fill (cy)	Cause
Submitted	0.74	1,963/1,963	
Change	*0.15*	*725/725*	Increased trench width
Revised Final	**0.89**	**2,688/2,688**	

Mitigation

Wetlands	Enhancement (ac)	Restoration (ac)	Cause
Submitted	1.7*	0.31	
Change	*(-0.24)*		Northern lobe not affected by drain tile decomm.
Change	*(-0.28)*		Horn Creek plantings discounted from mitigation
Change		*(-0.03)*	Retain culverts and associated upland areas
Revised Final	**1.18**	**0.28**	
Mitigation Credit Ratio	3:01	1:01	
Mitigation Credit	*0.39*	*0.28*	

Total Mitigation Credit 0.67 acre

Treatment Backwash. Based on the description in the *Proposed Action*, discharge of 0.12 cfs from treatment backwash will not affect stream chemistry as the backwash will be chemically neutralized and pH-adjusted prior to discharge into the vegetated ditch.

Water Withdrawals. NMFS considered the most relevant potential effects on instream habitat from water withdrawals to be increased water temperature, during late summer, instream habitat connectivity and pool quality. NMFS expects effects associated with water withdrawals to be minor based on the following interpretation of the low-flow habitat analysis.

If Pacific City withdrawals its projected peak daily demand of 2.7 cfs at the Horn Creek intake, water elevations downstream, to the head of tide, will decrease between 1.2 and 3.9 inches, depending on location. Instream flows will decrease to a minimum of 3.3 cfs. Residual pool depths will decrease 3.4 inches on average, riffle/glide habitat residual depths will decrease by 2.4 inches on average, and pool cross-sectional area would decrease by 1.5 feet, on average. These changes will occur episodically for less than 24 hours, typically in July and August, over periods lasting no longer than 3 to 4 days in a given year (biological assessment). However, during periods of peak daily water demand, Pacific City plans to use its well fields, which will reduce water withdrawals in Horn Creek by 1.3 cfs minimizing effects on instream habitat. Since these peak water withdrawals are daily peak demands that only last for 3 to 4 days, and can be augmented with water withdrawals from Pacific City's well field, NMFS does not expect the changes described above in water depth and surface area to pose significant risk to instream and riparian functions, or habitat availability or connectivity (Appendix A). The above conclusions are based on the assumption that peak water withdrawals are not sustained demands, but are peak daily demands that will not last for more than 3 to 4 days. Furthermore, since Pacific City did not submit an operations plan to NMFS for water withdrawals for 2019 through 2028, it is our assumption that instream flows will not drop below 2.5 cfs. Should these assumption change, NMFS is likely to reach a different conclusion regarding effects to instream habitat associated with water withdrawals.

Effects on Listed Species.

Timing of Salmon in the Action Area. Based on migratory and residence time, listed salmon will be present in the action area during the proposed period of construction and water withdrawal operations (Table 9).

Table 9. Timing of adult and juvenile coho salmon life history in the Nestucca watershed.

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Adult Upstream Migration	■	■							■	■	■	■
Spawning	■	■								■	■	■
Adult Holding	■	■							■	■	■	■
Incubation	■	■	■	■	■					■	■	■
Rearing	■	■	■	■	■	■	■	■	■	■	■	■
Juvenile Migration				■	■							
In-water Construction							■	■	■			

Based on data provided by ODFW, adult coho salmon migrate through but do not spawn in the action area. The arrival of adult salmon in Horn Creek is highly dependent upon the onset of fall rains to trigger upstream migration of adults to spawning areas in the upper watershed. Juvenile coho salmon likely are highest in the action area from late fall through spring due to higher flows and deeper pool habitat, and densities likely decrease in the summer as flows decline and the availability of pool habitat becomes limited.

Water Withdrawals. As determined earlier, NMFS calculated the equivalent-constant stream temperatures under existing conditions in Horn Creek to be 15°C (at intake) and 15.7°C (downstream), respectively. These existing water temperatures provide preferential habitat conditions for rearing juvenile anadromous salmonid fishes as described in EPA 2001. While surface water elevations will decrease on an intermittent basis, NMFS does not expect water withdrawals to affect water temperatures in Horn Creek in a manner that would result in physiological stress or increased risk to disease described in EPA 2001. Furthermore, NMFS does not expect water withdrawals to affect instream habitat connectivity and pool quality in Horn Creek in a manner that will result in a loss of available high quality pool habitat based on information on preferred pool habitat conditions described in Bjornn and Reiser (2001). The above conclusions are based on the assumption that peak water withdrawals are not sustained demands, but are peak daily demands that will not last for more than 3 to 4 days. Should these assumption change, NMFS would likely reach a different conclusion on effects to fish associated with water withdrawals.

The intake screen will be an *active screen* (Johnson Model T-16 HCE intake screen) that will utilize compressed air from the treatment plant to automatically clean the screen on a regular interval (once daily). NMFS' maximum approach velocity criteria for this type of screen is 0.4 feet second^{-1}. This corresponds to a minimum effective screen area of 6.7 feet squared for 1,200 gallons minute^{-1} (the maximum flow rate for the Horn Creek intake). The calculated effective screen area for this screen will be 7.0 square feet with a maximum approach velocity of 0.38 feet second^{-1}.

Effects on Migrating and Rearing Fish from Construction. As discussed in the *Effects on Habitat* section, NMFS expects construction-associated effects (*i.e.*, construction of the intake structure and rock weirs, treatment facility/pump station, and transmission pipelines; short-term impact minimization measures; wetland impacts; wetland mitigation; and installation of large woody debris structures and riparian planting) to instream and riparian habitat functions to be insignificant. Therefore, habitat-associated effects will not cause adverse effects, such as physiological stress, to juvenile or adult OC coho salmon. Effects to fish from fish salvage are discussed below.

Effects on Migrating and Rearing Fish. Fish salvage is required to ensure juvenile OC coho salmon are not trapped in the isolation areas prior to dewatering. Likewise, periodic maintenance of the water intake screens to remove sediment will require work area isolation and may require the capture and relocation (upstream of the cofferdam) of juvenile OC coho salmon.

Experienced biologists, *i.e.*, staff biologists with Parametrix or ODFW, will perform all fish salvage work. The salvage methods proposed include electrofishing, seining, and/or dip netting. Electrofishing will cause physiological stress and require recovery before fish are released.

Harmful effects of electrofishing can include internal and external hemorrhaging, fractured spines, and death if not conducted by an experienced biologist. A small number of fish, estimated by NMFS to be less than 5% of the number of fish captured, are likely to die from electrofishing. Seining and/or dip netting is unlikely to kill any juvenile OC coho salmon.

Based on information in the biological assessment, the total area of Horn Creek that will be isolated and where fish will be captured and relocated upstream during construction at the intake is 1,350 square feet (figure 5). If transmission lines are installed via open trench at the lower crossing on Horn Creek, the total area of Horn Creek that will be isolated and where fish will be captured and relocated upstream during construction is 450 square feet. The total area of Horn Creek that will be isolated and where fish will be captured and relocated upstream during maintenance is 100 square feet.

Escapement data collected by ODFW from 1992 through 2005 identified only one adult coho salmon in lower Horn Creek in 1996. The ODFW surveyed juvenile salmon approximately 0.5 miles upstream of the proposed intake by snorkeling in 2004 and 2005, covering reaches measuring 1,000 and 968 meters, respectively. The surveys found 0.18 and 0.30 fish per pool in 2004 and 2005, respectively.

Based on snorkeling data from ODFW, NMFS used the higher of the two fish density indices of 0.30 fish per pool to estimate capture associated with construction activities. Using the total area to be dewatered for the Horn Creek intake and the lower crossing, 1,800 square feet, the ODFW fish density index of 0.30 fish per pool, NMFS estimates that 56 juvenile OC coho salmon are likely to be captured and relocated upstream during construction.

Based on snorkeling data from ODFW, and the total area of habitat to be dewatered during yearly maintenance (100 square feet), NMFS used the higher of the two fish density indices of 0.30 fish per pool to estimate capture associated with maintenance activities. Using the total area to be dewatered for maintenance at the Horn Creek intake, 100 square feet, the ODFW fish density of 0.30 fish per pool, NMFS estimates that 3 juvenile OC coho salmon are likely to be captured and relocated upstream during maintenance activities.

The NMFS expects that 56 juvenile OC coho salmon will be captured and relocated upstream during construction, and 3 fish per year during maintenance will be captured and relocated upstream.

The most recent escapement estimate (2004) for the Nestucca population was 6,402 adult fish. To estimate annual juvenile production in the Nestucca River basin as a means to assess the significance of likely mortalities associated with the proposed action, NMFS calculated a smolt production index based on the OC coho salmon fecundity index of 1,983 eggs female $^{-1}$ in Groot and Margolis (1991). Using this information results in 4,627,388 eggs (based on a mean egg survival-to-emergence rate of 27.1%, Groot and Margolis 1991) and 46,274 and 92,547 smolts being produced annually, based on an egg-to-smolt survival rate of 1% and 2%, respectively.

Based on the Nestucca River basin annual smolt production estimate, losing up to 56 juvenile fish for the 2009 brood stock year will have no meaningful affect on OC coho salmon VSP

attributes at the population level. Likewise, the loss of up to 3 juvenile fish per year as a result of maintenance activities will have no meaningful affect on OC coho salmon VSP attributes at the population level.

Effects on Critical Habitat

The potential effects of the proposed action on freshwater rearing sites, freshwater migration corridors, and their essential physical and biological features (listed in Table 6) are discussed below.

Freshwater Rearing Sites.
Floodplain connectivity – No effects are likely to occur.

Forage/Food – Insignificant, localized negative effects on macroinvertebrate abundance are likely to occur within the cofferdam, but affected populations are likely to re-establish after the end of construction.

Natural Cover – Installation of large woody debris and riparian plantings will provide localized improvements for cover and organic inputs over time.

Water Quality – Minor effects, *e.g.*, intermittent increases in suspended sediment, are likely due to occur construction and to installation of LWD structures. Minor effects, *i.e.*, short-term increases in temperatures, are likely to occur in association with peak period water withdrawals. These minor effects are likely to attenuate as new riparian plantings mature.

As determined earlier, NMFS calculated the equivalent-constant stream temperatures under existing conditions in Horn Creek to be 15°C (at intake) and 15.7°C (downstream), respectively. These existing water temperatures provide preferential habitat conditions for rearing juvenile anadromous salmonid fishes as described in EPA 2001. While surface water elevations will decrease on an intermittent basis, NMFS does not expect water withdrawals to affect water temperatures in Horn Creek in a manner that would result in physiological stress or increased risk to disease described in EPA 2001. Furthermore, NMFS does not expect water withdrawals to affect instream habitat connectivity and pool quality in Horn Creek in a manner that will result in a loss of available high quality pool habitat based on information on preferred pool habitat conditions described in Bjornn and Reiser (2001).

Water quantity – NMFS considered the most relevant potential effects on instream habitat from water withdrawals to be increased water temperature, during late summer, instream habitat connectivity and pool quality. NMFS expects effects associated with water withdrawals to be insignificant based on the following interpretation of the low-flow habitat analysis.

If Pacific City withdrawals its projected peak daily demand of 2.7 cfs at the Horn Creek intake, water elevations downstream, to the head of tide, will decrease between 1.2 and 3.9 inches, depending on location. Instream flows will decrease to a minimum of 2.5 cfs. Residual pool depths will decrease 3.4 inches on average, riffle/glide habitat residual depths will decrease by 2.4 inches on average, and pool cross-sectional area would decrease by 1.5 feet, on average.

These changes will occur episodically for less than 24 hours, typically in July and August, over periods lasting no longer than 3 to 4 days in a given year (biological assessment). However, during periods of peak daily water demand, Pacific City plans to use its well fields, which will reduce water withdrawals in Horn Creek by 1.3 cfs minimizing effects on instream habitat. Since these peak water withdrawals are daily peak demands that only last for 3 to 4 days, and can be augmented with water withdrawals from Pacific City's well field, NMFS does not expect the changes described above in water depth and surface area to pose significant risk to instream and riparian functions, or habitat availability or connectivity (Appendix A). The above conclusions are based on the assumption that peak water withdrawals are not sustained demands, but are peak daily demands that will not last for more than 3 to 4 days. Furthermore, since Pacific City did not submit an operations plan to NMFS for water withdrawals for 2019 through 2028, it is our assumption that instream flows will not drop below 2.5 cfs. Should these assumption change, NMFS is likely reach a different conclusion regarding effects to instream habitat associated with water withdrawals.

Freshwater Migration Corridors.
Free of Artificial Obstructions – Passage routes of juvenile salmon will be impaired during construction, due to work area isolation, but will be restored post-construction.

Natural Cover/Cover-Shelter – Installation of large woody debris and riparian plantings will provide localized improvements for cover and organic inputs over time.

Water Quality – Minor effects, *e.g.*, intermittent increases in turbidity levels, are likely to occur in associated with construction activities and installation of LWD structures. Minor effects, *i.e.*, short-term increases in temperatures, are likely to occur in association with peak water withdrawals. These minor effects are likely to attenuate as new riparian plantings mature.

As determined earlier, NMFS calculated the equivalent-constant stream temperatures under existing conditions in Horn Creek to be 15°C (at intake) and 15.7°C (downstream), respectively. These existing water temperatures provide preferential habitat conditions for rearing juvenile anadromous salmonid fishes as described in EPA 2001. While surface water elevations will decrease on an intermittent basis, NMFS does not expect water withdrawals to affect water temperatures in Horn Creek in a manner that would result in physiological stress or increased risk to disease described in EPA 2001. Furthermore, NMFS does not expect water withdrawals to affect instream habitat connectivity and pool quality in Horn Creek in a manner that will result in a loss of available high quality pool habitat based on information on preferred pool habitat conditions described in Bjornn and Reiser (2001).

Water Quantity – NMFS considered the most relevant potential effects on instream habitat from water withdrawals to be increased water temperature, during late summer, instream habitat connectivity and pool quality. NMFS expects effects associated with water withdrawals to be insignificant based on the following interpretation of the low-flow habitat analysis (Appendix A).

If Pacific City withdrawals its projected peak daily demand of 2.7 cfs at the Horn Creek intake, water elevations downstream, to the head of tide, will decrease between 1.2 and 3.9 inches,

depending on location. Instream flows will decrease to a minimum of 2.5 cfs. Residual pool depths will decrease 3.4 inches on average, riffle/glide habitat residual depths will decrease by 2.4 inches on average, and pool cross-sectional area would decrease by 1.5 feet, on average. These changes will occur episodically for less than 24 hours, typically in July and August, over periods lasting no longer than 3 to 4 days in a given year (biological assessment). However, during periods of peak daily water demand, Pacific City plans to use its well fields, which will reduce water withdrawals in Horn Creek by 1.3 cfs minimizing effects on instream habitat. Since these peak water withdrawals are daily peak demands that only last for 3 to 4 days, and can be augmented with water withdrawals from Pacific City's well field, NMFS does not expect the changes described above in water depth and surface area to pose significant risk to instream and riparian functions, or habitat availability or connectivity (Appendix A). The above conclusions are based on the assumption that peak water withdrawals are not sustained demands, but are peak daily demands that will not last for more than 3 to 4 days. Furthermore, since Pacific City did not submit an operations plan to NMFS for water withdrawals for 2019 through 2028, it is our assumption that instream flows will not drop below 2.5 cfs. Should these assumption change, NMFS is likely reach a different conclusion regarding effects to instream habitat associated with water withdrawals.

Information presented in the status and baseline sections of this Opinion demonstrates that conditions for freshwater rearing and migration are factors limiting the survival and recovery of the listed species. The proposed action will slightly lower the conservation value of Horn Creek in the action area with respect to the water quantity PCE during peak water withdrawals. These effects will be localized and therefore will not be significant at the scale of the watershed or designation of critical habitat. The other PCEs will not be significantly affected.

Cumulative Effects

Population growth in Pacific City is currently about 4.2% per year and is projected to double by 2023 (biological assessment).

The NMFS assumes that future private and state actions will continue within the action area. Upstream agricultural practices and timber harvest are likely to continue to maintain sediment yields and have a negative effect on water quality and delivery of fertilizer and pesticides to surface water that degrade water quality. The NMFS is not aware of any specific future non-Federal activities within the action area that will cause greater effects to OC coho salmon or their designated critical habitat than presently occurs.

Conclusion

After reviewing the status of OC coho salmon and designated critical habitat, the environmental baseline for the action area, the effects of the proposed action and cumulative effects, NMFS concludes that the proposed action is not likely to jeopardize the continued existence of OC coho salmon and is not likely to destroy or adversely modify designated critical habitat. These conclusions are based on the following considerations.

The analysis of effects demonstrates that the proposed action will not affect any of the VSP attributes at the population scale. Therefore, the likelihood of survival and recovery for this species will not be appreciably reduced by the proposed action. The analysis of effects demonstrates that the proposed action is not likely to lower the conservation value of any of the PCEs at the scale of the watershed or designation of critical habitat. Therefore, the action is not likely to destroy or adversely modify critical habitat.

Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. The following recommendation is a discretionary measure that is consistent with this obligation and therefore should be carried out by the Corps.

1. The Corps should encourage Pacific City, via special permit requirements, to ensure that as part of the City's overall water management plan, the City's well fields are managed in a manner that ensures that the 1.3 cfs of water these well fields hold are fully utilized prior to or in conjunction with the Horn Creek intake to minimize water withdrawals on Horn Creek during periods of peak water demand to minimize effects to instream habitat.

Reinitiation of Consultation

Reinitiation of formal consultation is required and shall be requested by the Federal agency or by NMFS where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If the amount or extent of taking specified in the incidental take statement is exceeded; (b) if new information reveals effects of the action that may affect listed species or designated critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that has an effect to the listed species or designated critical habitat that was not considered in the biological opinion; (d) if a new species is listed or critical habitat is designated that may be affected by the identified action (50 CFR 402.16); or if instream flows fall below 2.5 cfs. To reinitiate consultation, contact the Oregon State Habitat Office of NMFS, and refer to NMFS Number 2008/02002.

Incidental Take Statement

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harassment applies to actions that create the potential for injury by significantly disrupting normal behavioral patterns including breeding, spawning, rearing, migrating, feeding or sheltering. To be significant, harassment must be capable of resulting in the death or injury of fish or wildlife. Harm applies to actions that result in actual injury or death, including actions that cause environmental damage leading to injury or death. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Section 7(o)(2) provides that taking that is incidental to an otherwise

legal agency action is not considered to be prohibited taking under the ESA, if that action is performed in compliance with the terms and conditions of this incidental take statement.

Amount or Extent of Take

Juvenile OC coho salmon are reasonably certain to co-occur in time and space with effects of the proposed action that could cause take. The action will occur during the summer: therefore, adult OC coho salmon will not be present or exposed to the direct construction effects, nor will they be exposed to long-term effects that could cause take. The distribution and abundance of fish that occur within an action area are affected by an array of ecological interactions that influence genetic, population, and environmental characteristics. These biotic and environmental processes interact in ways that may be random or directional, and may operate across far broader temporal and spatial scales than are affected by the proposed action.

Incidental take caused by the proposed action will include capture and handling of juvenile fish during work area isolation and dewatering activities. This take will occur only within the isolated work area(s). Incidental take within that area that meets the terms and conditions of this incidental take statement will be exempt from the taking prohibition.

For construction, NMFS expects no more than 56 fish to be captured or trapped. For maintenance, NMFS expects that no more than 3 juvenile fish will be captured or trapped per year.

Reasonable and Prudent Measures

The following measures are necessary and appropriate to minimize the impact of incidental take of listed species from the proposed action:

The Corps shall:

1. Avoid or minimize the amount and extent of take resulting from fish salvage.
2. Ensure that impact minimization and mitigation measures are fully implemented.
3. Ensure take is minimized by maintaining minimum instream flows.
4. Ensure completion of a monitoring and reporting program to confirm that the take exemption for the proposed action is not exceeded, and that the terms and conditions in this incidental take statement are effective in minimizing the impact of incidental take.

Terms and Conditions

The measures described below are non-discretionary, and must be undertaken by the Corps or, if an applicant is involved, must become binding conditions of any permit or grant issued to the applicant, for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require an applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the

impact of incidental take, the Corps must report the progress of the action and its impact on the species to NMFS as specified in the incidental take statement.

1. To implement reasonable and prudent measure #1, the Corps shall ensure that fish salvage operations are limited to using seines and/or dip nets. Electrofishing is not authorized under this Opinion.

2. To implement reasonable and prudent measure #2, the Corps shall ensure that all impact minimization and mitigation measures are fully implemented as proposed.

3. To implement reasonable and prudent #3 (instream flows), the Corps shall ensure that water withdrawals at the Horn Creek intake do not exceed 2.7 cfs, and minimum instream flows do not drop below 2.5 cfs.

    a. When water withdrawals on Horn Creek reach 2.0 cfs, instream flows shall be measure concurrently at two locations until water withdrawals drop below 2.0 cfs. The first location shall be located approximately 250 feet from the confluence of Horn Creek and the Nestucca River. The second location shall be located approximately 250 feet above the head of tide.

4. To implement reasonable and prudent measure #4 (monitoring), the Corps shall:

    a. Provide NMFS with a post-construction report detailing the number, by species and age class, of fish captured by fish salvage operations. The condition of each fish captured shall be identified in the report and noted if the fish were killed, injured, released/not released, or specimen preserved and submitted to law enforcement.
    b. Annually, for maintenance, submit a report to NMFS detailing the number, by species and age class, of fish captured by fish salvage operations. The condition of each fish captured shall be identified in the report and noted if the fish were killed, injured, released/not released, or specimen preserved and submitted to law enforcement.
    c. NOTICE: If a sick, injured or dead specimen of a threatened or endangered salmon or steelhead species found in the project area, the finder must notify NMFS through the contact person identified in the transmittal letter for this Opinion (CRCIP), or through the NMFS Office of Law Enforcement at 1-800-853-1964, and follow any instructions. If the proposed action may worsen the fish's condition before NMFS can be contacted, the finder should attempt to move the fish to a suitable location near the capture site while keeping the fish in the water and reducing its stress as much as possible. Do not disturb the fish after it has been moved. If the fish is dead, or dies while being captured or moved, report the following information: (1) NMFS consultation number; (2) the date, time, and location of discovery; (3) a brief description of circumstances and any information that may show the cause of death; and (4) photographs of the fish and where it was found. The NMFS also suggests that the finder coordinate with local biologists to recover any tags or other relevant research information. If the

specimen is not needed by local biologists for tag recovery or by NMFS for analysis, the specimen should be returned to the water in which it was found, or otherwise discarded.

d. Annually, submit a report that details Pacific City's operation plan, including peak demand, Horn Creek withdrawals, well field withdrawals, and duration of peak withdrawals.

e. Annually, for a period of 5 years, submit a report to NMFS that summarizes the results of the post-construction instream temperature monitoring, low flow habitat analysis, and the effectiveness of the installation of the large woody debris structures in creating pools and providing habitat and riparian planting survival.

f. As required by term and condition #2, submit a monitoring report detailing instream flow measurements collected during periods of peak water withdrawals exceeding 2.0 cfs

g. Submit a copy of the report(s) to the Oregon Habitat State Office of NMFS.

Oregon State Habitat Office
National Marine Fisheries Service
Attn: 2008/02002
1201 NE Lloyd Blvd., Ste. 1100
Portland, Oregon 97232-1274

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The consultation requirement of section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions, or proposed actions that may adversely affect EFH. Adverse effects include the direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside EFH, and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that may be taken by the action agency to conserve EFH.

The Pacific Fishery Management Council (PFMC) designated EFH for groundfish (PFMC 2006), coastal pelagic species (PFMC 1998), and Chinook salmon, coho salmon, (PFMC 1999). The proposed action and action area for this consultation are described in the Introduction to this document. The action area includes areas designated as EFH for coho salmon.

Based on information provided in the biological assessment and the analysis of effects presented in the ESA portion of this document, NMFS concludes that proposed action will have intermittent effects affects on water quantity on EFH designated for coho salmon.

EFH Conservation Recommendations

The NMFS provides no conservation measures to avoid, mitigate, or offset the impact that the proposed action has on EFH.

Statutory Response Requirement

Federal agencies are required to provide a detailed written response to NMFS' EFH conservation recommendations within 30 days of receipt of these recommendations [50 CFR 600.920(j) (1)]. Since NMFS provided no conservation recommendations, a response is not required.

Supplemental Consultation

The Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations [50 CFR 600.920(k)].

DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

Section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-554) (Data Quality Act) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the Opinion addresses these Data Quality Act (DQA) components, documents compliance with the DQA, and certifies that this Opinion has undergone pre-dissemination review.

Utility: Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users.

This ESA consultation concludes that the proposed activities in Horn Creek will not jeopardize the affected species. Therefore, the Corps can proceed with this action in accordance with its authority under the Clean Water Act. The intended user is the Corps and Pacific City.

Individual copies were provided to the above-listed entities. This consultation will be posted on the NMFS Northwest Region website (http://www.nwr.noaa.gov). The format and naming adheres to conventional standards for style.

Integrity: This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

Objectivity:

Information Product Category: Natural Resource Plan.

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA Regulations, 50 CFR 402.01, *et seq.*, and the MSA implementing regulations regarding EFH, 50 CFR 600.920(j).

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the Literature Cited section. The analyses in this Opinion/EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with Northwest Region ESA quality control and assurance processes.

LITERATURE CITED

Bjornn, T.C. and D.W. Reiser. 1991. Habitat requirements of salmonids in streams – Influences of forest and rangeland management on salmonid fishes and their habitats. Pp. 83-138. American Fisheries Society Special Publication #19.

CIG (Climate Impacts Group). 2004. Overview of climate change impacts n the U.S. Pacific Northwest. Climate Impacts Group, University of Washington, Seattle. 13p. August 17.

EPA (Environmental Protection Agency) 2001. Technical Synthesis: Scientific issues relating to temperature criteria for salmon, trout, and char native to the Pacific Northwest. EPA 910-R-01-007.

Groot, C. and L. Margolis. 1991. Pacific Salmon Life Histories. UBC Press, Vancouver, Canada. 564 p.

Hogarth, W.T. 2005. Memorandum from William T. Hogarth, to Regional Administrators, Office of Protected Resources, NMFS, Regarding Application of the "Destruction or Adverse Modification" Standard Under Section 7(a)(2) of the Endangered Species Act. 3 p. November 7.

ISAB (Independent Scientific Advisory Board). 2007. Climate change impacts on Columbia River Basin fish and wildlife. ISAB Climate Change Report, ISAB 2007-2, Northwest Power and Conservation Council, Portland, Oregon.

Lawson, P.W., E. P. Bjorkstedt, M. W. Chilcote, C. W. Huntington, J. S. Mills, K. M. Moores, T. E. Nickelson, G. H. Reeves, H. A. Stout, T. C. Wainwright, L. A. Weitkamp. 2007. Identification of historical populations of coho salmon (*Onchorynchus kisutch*) in the Oregon Coast evolutionarily significant unit. U.S. Department of Commerce, NOAA Technical Memorandum, NMFS-NWFSC-79, 129 p.

NMFS (National Marine Fisheries Service). 2006. 2006 Report to Congress: Pacific Coastal Salmon Recovery Fund, FY 2000-2005. U.S. Department of Commerce, NOAA, National Marine Fisheries Service, Washington, D.C.

Scheuerell, M.D., and J.G. Williams. 2005. Forecasting climate-induced changes in the survival of Snake River spring/summer Chincook salmon (*Oncorhynchus tshawytscha*). Fisheries Oceanography 14:448-457.

Wainwright, T.C., M. W. Chilcote, P. . Lawson, T.E. Nickelson, C.W. Huntington, J.S. Mills, K.M. Moore, G.H. Reeves, H A. Stout, and L.A. Weitkamp. 2008. Biological recovery criteria for the Oregon Coast coho salmon evolutionarily significant unit. U.S. Dept. of Commerce, NOAA Tech. Memo., NMFS-NWFSC-91, 199 p.

Zabel, R.W., M.D. Scheuerell, M./M. McLure, and J.G. Williams. 2006. The interplay between climate variability and density dependence in the population viability of Chinook salmon. Conservation Biology 20:190-200.

Appendix A. Temperature Data and Cross-Sectional Profiles for Horn Creek (Existing Conditions)

Figure 1. Horn Creek study area.

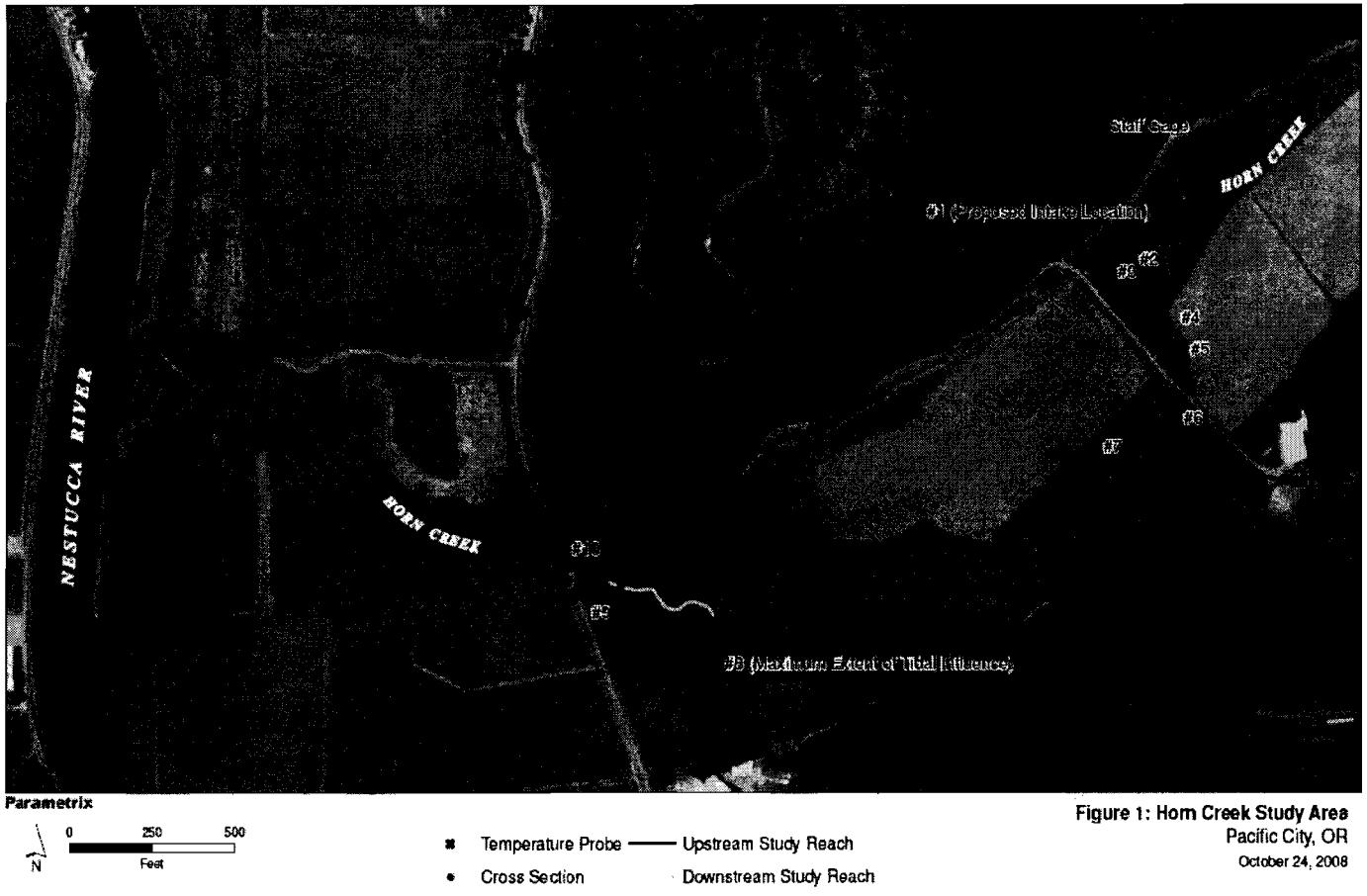


Table 1. Horn Creek (Intake) temperature profile from July 19, 2008 through September 15, 2008.

Min Temp	Max Temp	Hours Below 14°C	Hours b/t 14-18°C	Hours Above 18°C	Min Temp	Max Temp	Hours Below 14°C	Hours b/t 14-18°C	Hours Above 18°C
10.8	15.7	16.5	7.5	0	13	14.8	18	6	0
9.9	16	15.5	8.5	0	12.9	14.3	20	4	0
10.6	15.7	17	7	0	13.2	14.2	18.5	5.5	0
11.2	15.5	17.5	6.5	0	12.7	16.6	14.5	9.5	0
10.5	15.9	16.5	7.5	0	11.2	16.5	14	10	0
9.8	15.9	16	8	0	11.5	16.3	12.5	11.5	0
11.1	14.6	20.5	3.5	0	12	13.8	24	0	0
10.9	14.2	22	2	0	12.1	16.5	14	10	0
12	16.2	15	9	0	11.4	16	14.5	9.5	0
10.6	16.5	15	9	0	12.6	16.3	13	11	0
11.5	13.2	24	0	0	11.4	16.9	11.5	12.5	0
11.8	15.7	17	7	0	12.6	15.5	12.5	11.5	0
10.2	16.3	14.5	9.5	0	11.4	15.7	17	7	0
12.4	14.9	18.5	5.5	0	10.5	15.1	18.5	5.5	0
12	16.3	15.5	8.5	0	11.4	14.8	19	5	0
10.3	16.3	15	9	0	10.5	15.5	17.5	6.5	0
11.4	16.6	14	10	0	10.9	15.7	16.5	7.5	0
12.1	15.2	16	8	0	10.6	15.9	16	8	0
12.4	15.7	15.5	8.5	0	10.6	16.2	15.5	8.5	0
12.6	14.2	20	4	0	12	16.9	13.5	10.5	0
12.1	14.6	19.5	4.5	0	12.1	17.2	12	12	0
12.1	15.9	16	8	0	11.7	17.4	12.5	11.5	0
12.4	16.6	12.5	11.5	0	12.3	15.9	16.5	7.5	0
12.6	18.1	9.5	12.5	2	10.6	15.7	17	7	0
13.3	16.3	10.5	13.5	0	10.5	16.3	15.5	8.5	0
12.1	18	10	14	0	11.4	16.2	16	8	0
12.4	18.1	9	13.5	1.5	10.2	15.4	18.5	5.5	0
13	16.8	10.5	13.5	0	10.1	15.7	16.5	7.5	0
13.2	17.1	9.5	14.5	0	10.8	15.7	17	7	0
13	14.2	22	2	0					

Table 2. Horn Creek (downstream location) temperature profile from July 19, 2008 through September 15, 2008.

Min Temp	Max Temp	Hours Below 14°C	Hours b/t 14-18°C	Hours Above 18°C	Min Temp	Max Temp	Hours Below 14°C	Hours b/t 14-18°C	Hours Above 18°C
11.1	16.6	16	8	0	13.2	15.4	14.5	9.5	0
10.2	16.9	14.5	9.5	0	13.2	14.8	16.5	7.5	0
10.9	16.6	15.5	8.5	0	13.5	14.5	14.5	9.5	0
11.5	16.6	16	8	0	13.2	17.1	13	11	0
10.8	16.8	15	9	0	11.5	17.4	12.5	11.5	0
10.1	16.8	15	9	0	12	17.4	11.5	12.5	0
11.7	15.4	18.5	5.5	0	12.3	14.2	18.5	5.5	0
11.2	14.8	18	6	0	12.6	16.5	12.5	11.5	0
12.1	17.2	13.5	10.5	0	12.4	15.7	13	11	0
11.1	17.4	13	11	0	13.3	16.2	9.5	14.5	0
12	13.5	24	0	0	12.3	16.6	11	13	0
12.1	16	14	10	0	13.6	15.5	5	19	0
10.9	16.8	12	12	0	12.6	15.2	11.5	12.5	0
12.9	16	13.5	10.5	0	11.7	14.6	18.5	5.5	0
12.4	16.9	14	10	0	12.1	14.8	18	6	0
10.8	16.9	13.5	10.5	0	11.2	15.4	16.5	7.5	0
11.7	17.4	13	11	0	11.8	15.7	15.5	8.5	0
12.6	15.4	13.5	10.5	0	11.7	16	15.5	8.5	0
12.7	16	13.5	10.5	0	11.5	16.3	14	10	0
12.9	14.8	16	8	0	12.6	16.8	13.5	10.5	0
12.4	15.1	16.5	7.5	0	12.9	17.4	10	14	0
12.3	16.3	13	11	0	12.6	17.1	9	15	0
12.7	17.4	11.5	12.5	0	13.2	15.7	11	13	0
13	19.4	9.5	9	5.5	11.7	15.5	15	9	0
13.8	16.6	5	19	0	11.5	16	14.5	9.5	0
12.7	18.9	8	12	4	12.3	15.7	14.5	9.5	0
12.9	19.2	7	12	5	11.4	15.1	17.5	6.5	0
13.5	17.4	7.5	16.5	0	11.2	15.4	17	7	0
13.5	17.8	6.5	17.5	0	11.8	15.1	17.5	6.5	0
13.5	14.9	11	13	0					

Figure 2. Cross-section profile of Horn Creek and extrapolated water elevations based on multiple water withdrawal scenarios.

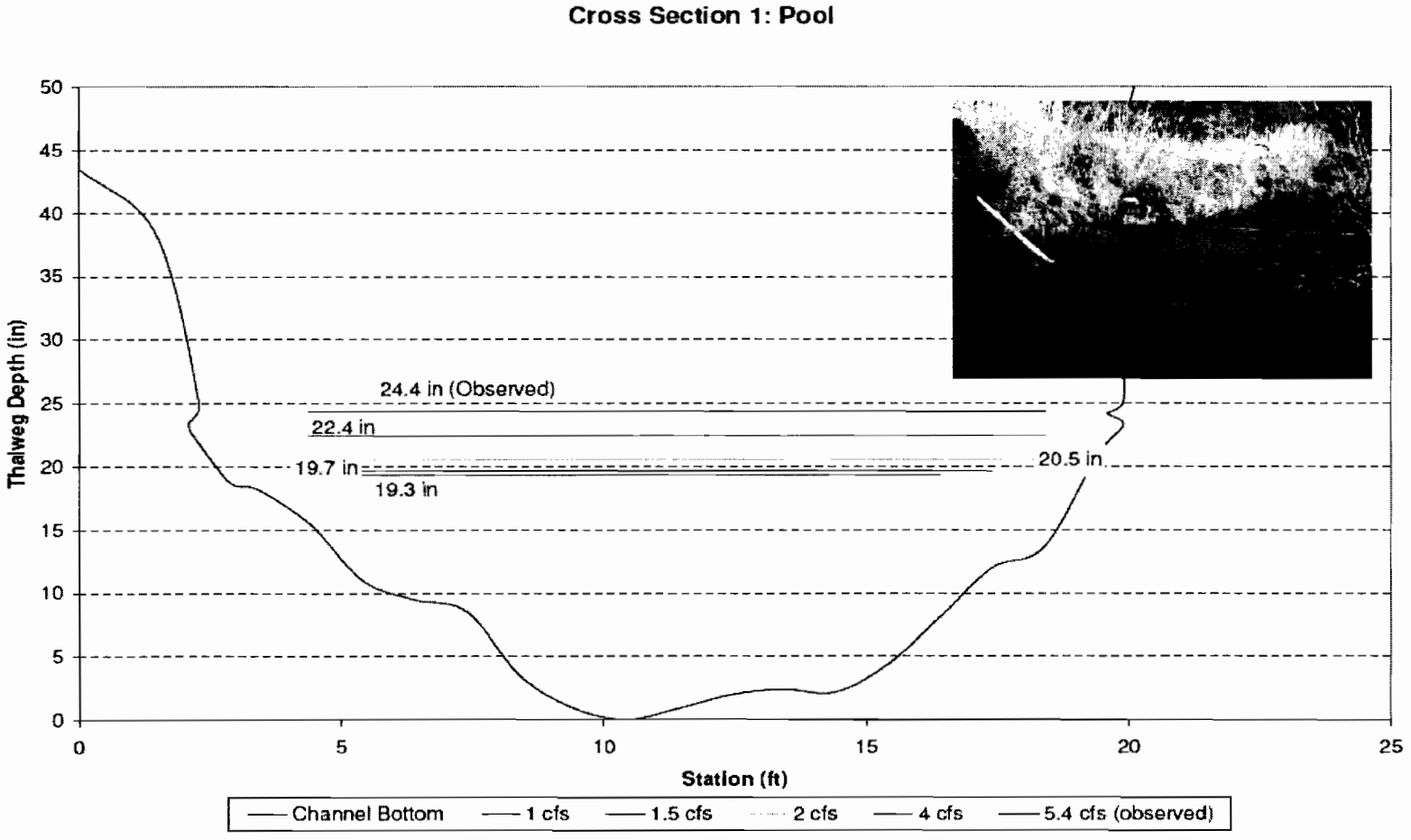


Figure 3. **Cross-section profile of Horn Creek and extrapolated water elevations based on multiple water withdrawal scenarios.**

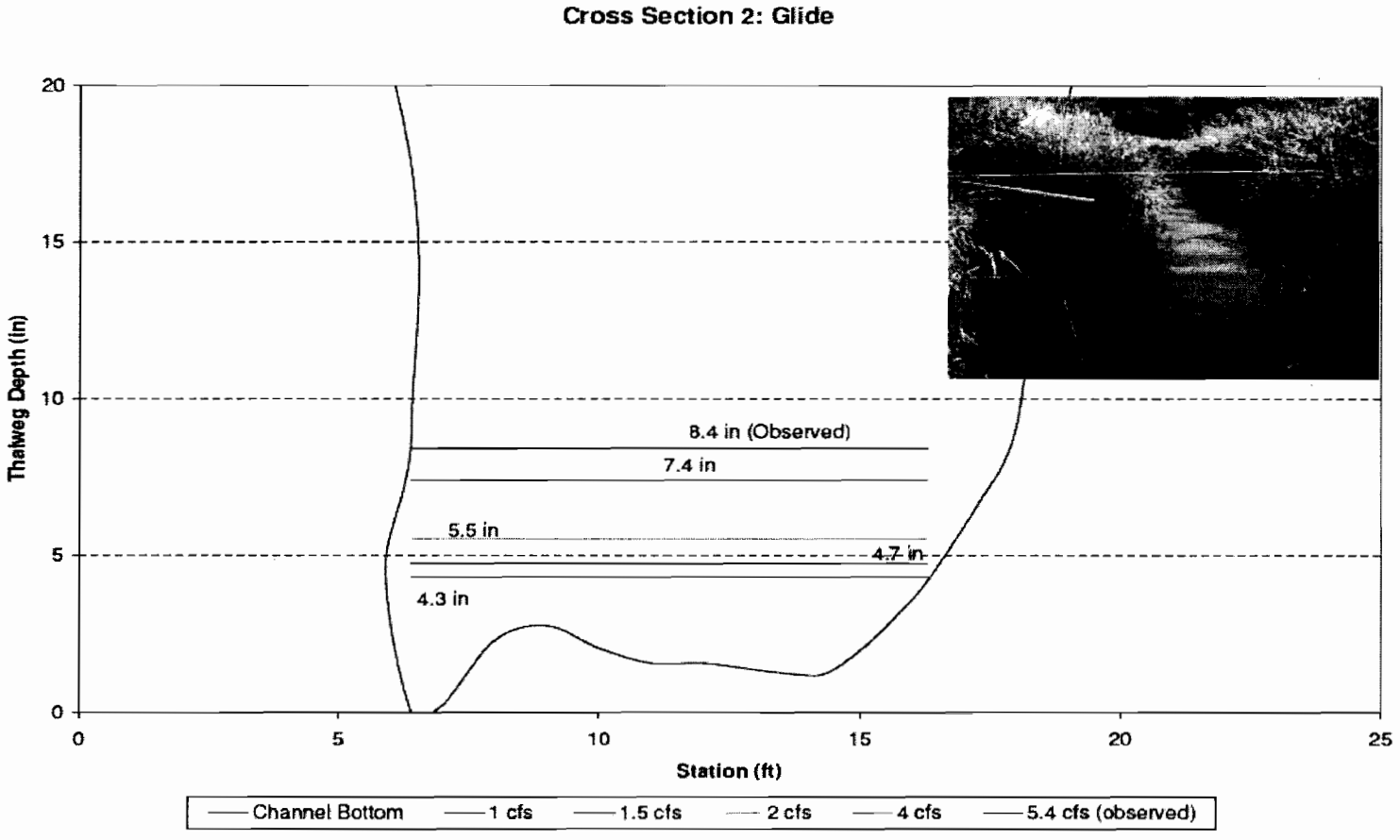


Figure 4. Cross-section profile of Horn Creek and extrapolated water elevations based on multiple water withdrawal scenarios.

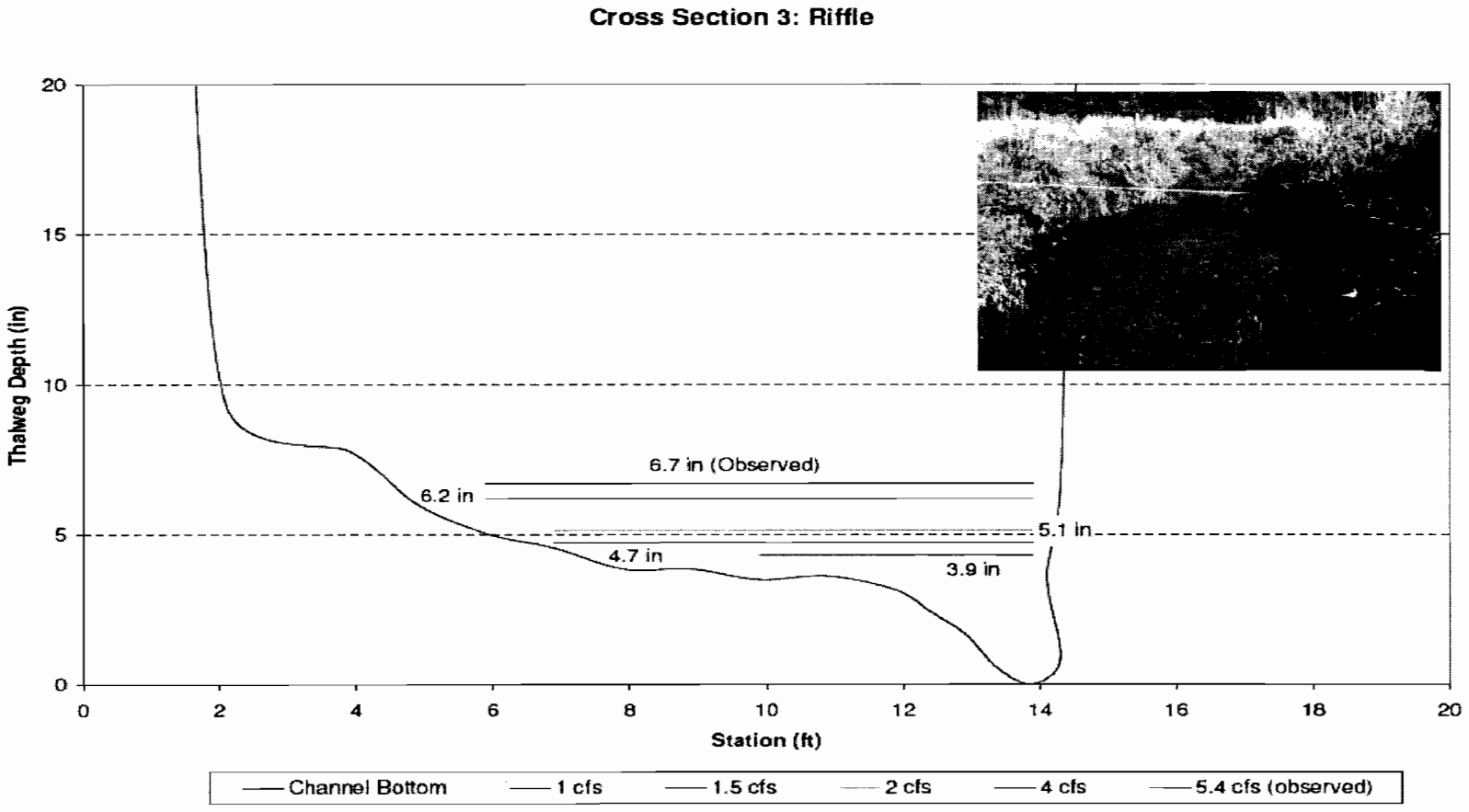


Figure 5. Cross-section profile of Horn Creek and extrapolated water elevations based on multiple water withdrawal scenarios.

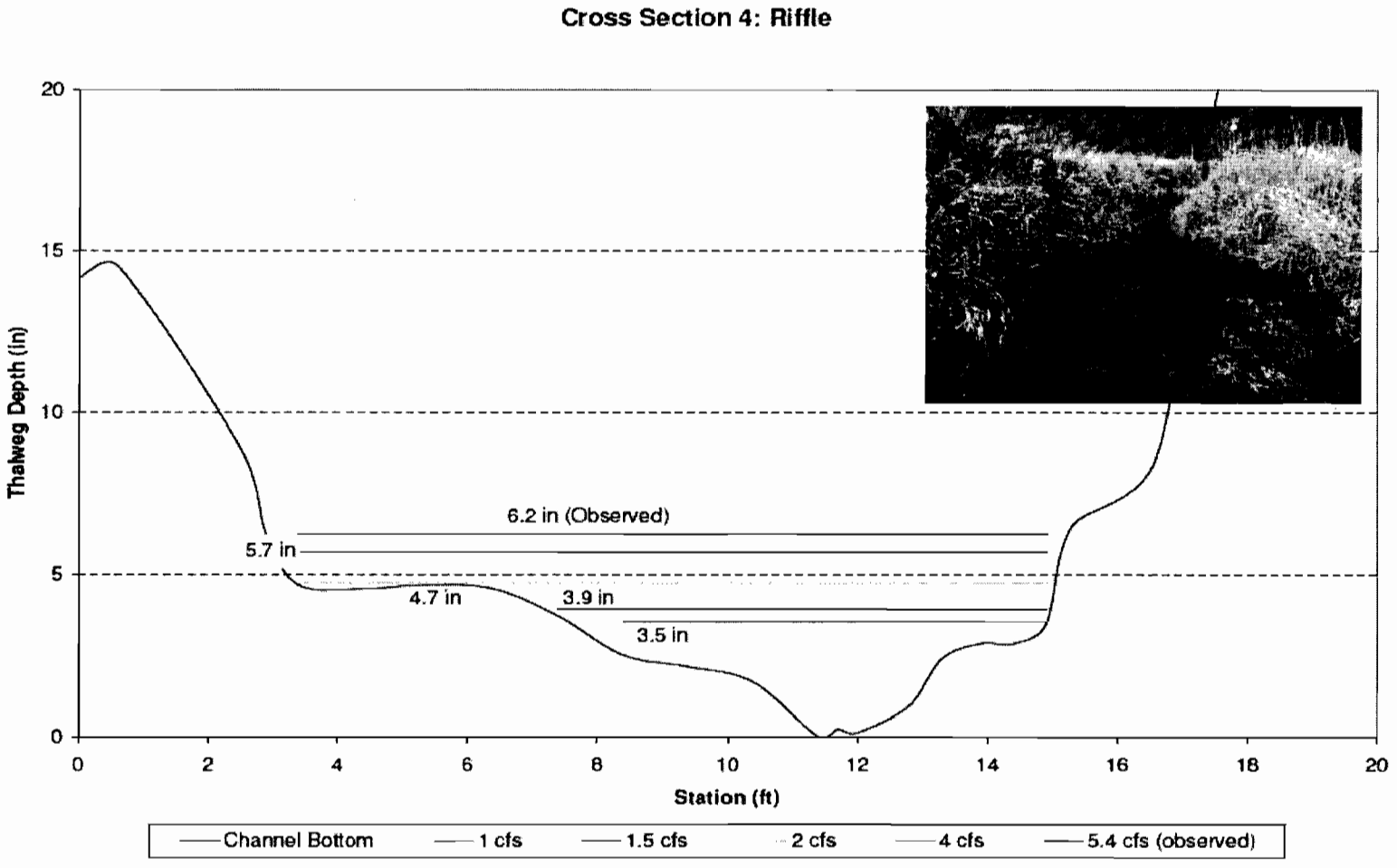


Figure 6. Cross-section profile of Horn Creek and extrapolated water elevations based on multiple water withdrawal scenarios.

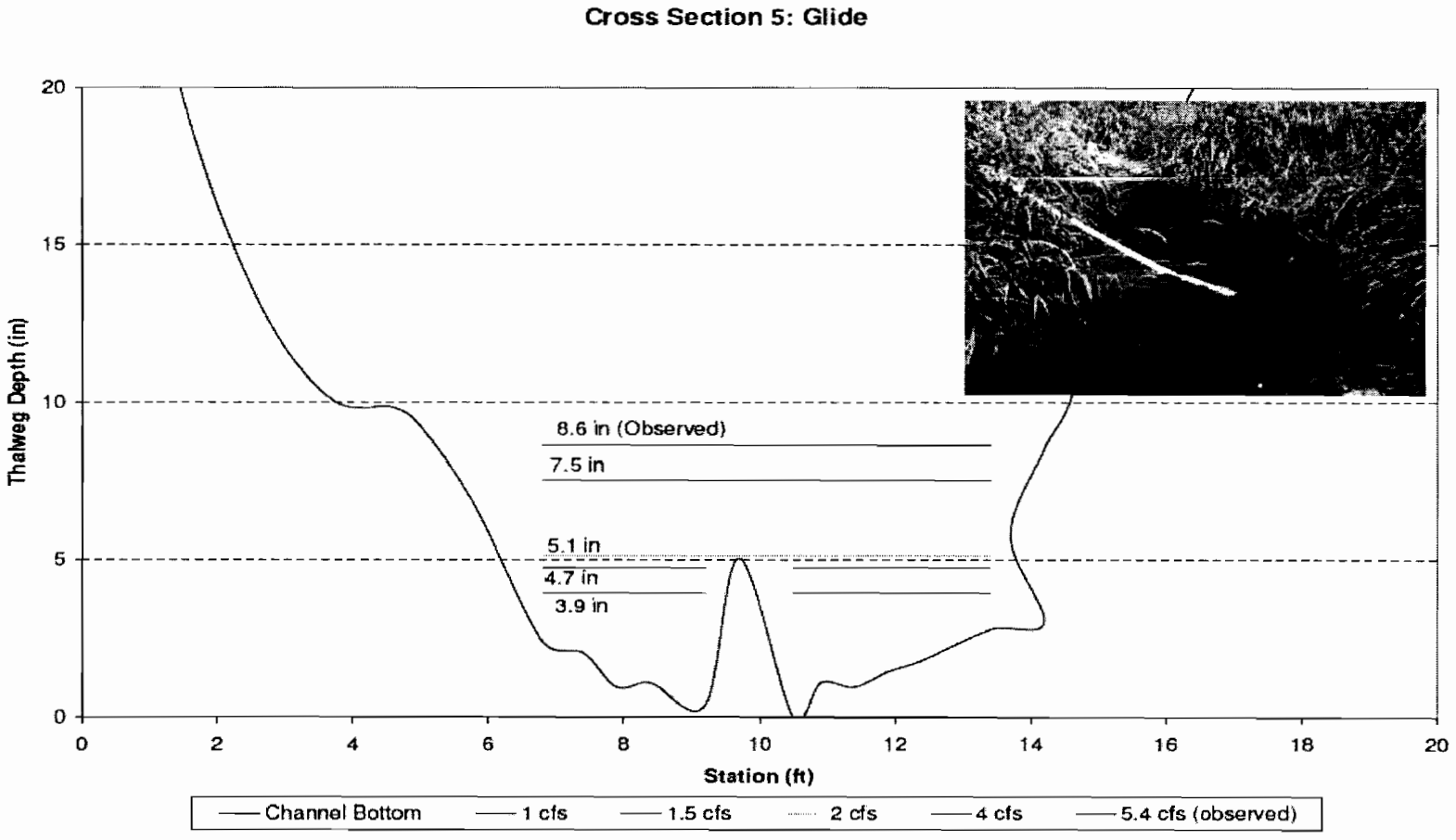


Figure 7. Cross-section profile of Horn Creek and extrapolated water elevations based on multiple water withdrawal scenarios.

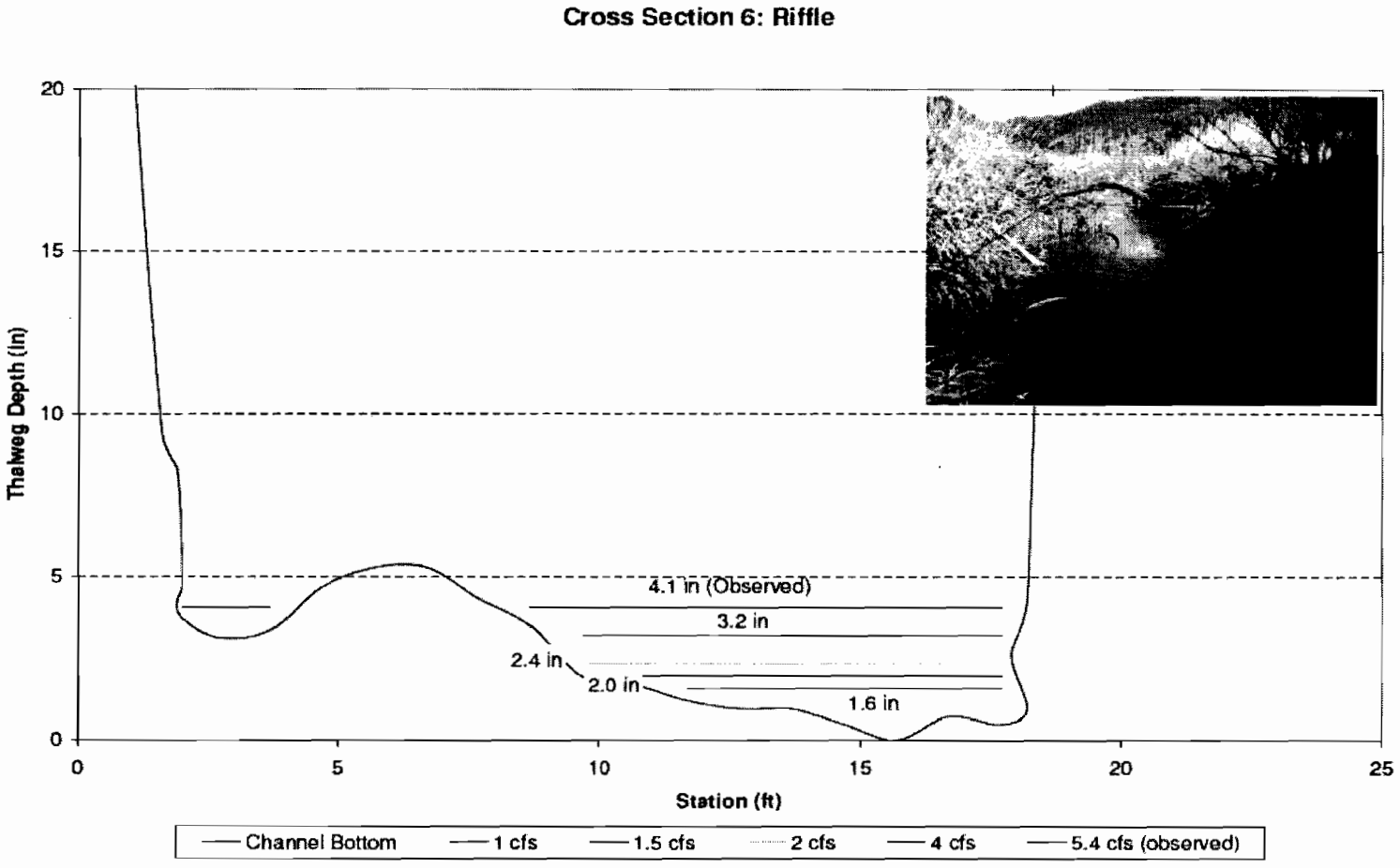


Figure 8. Cross-section profile of Horn Creek and extrapolated water elevations based on multiple water withdrawal scenarios.

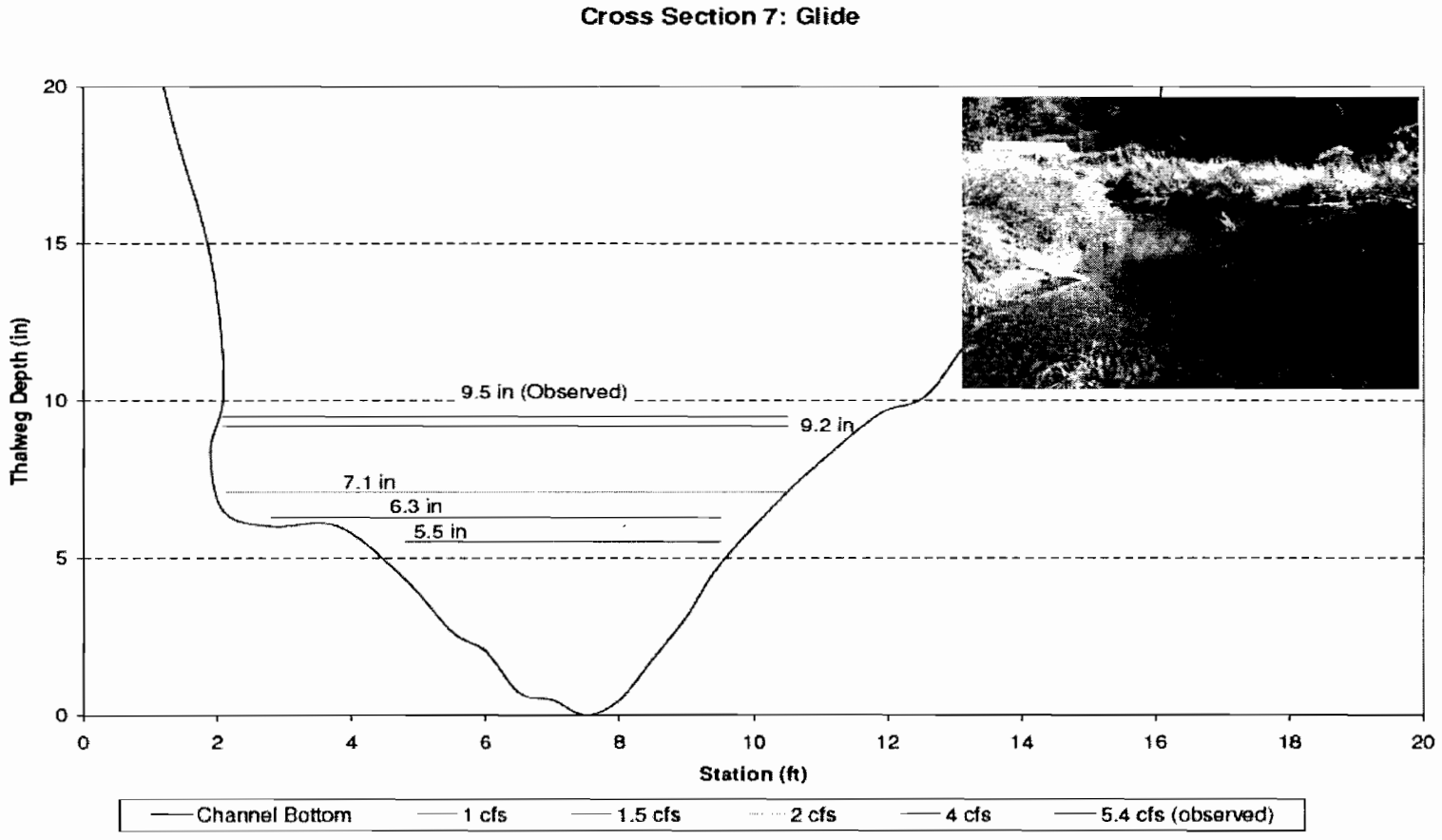


Figure 9. Cross-section profile of Horn Creek and extrapolated water elevations based on multiple water withdrawal scenarios.

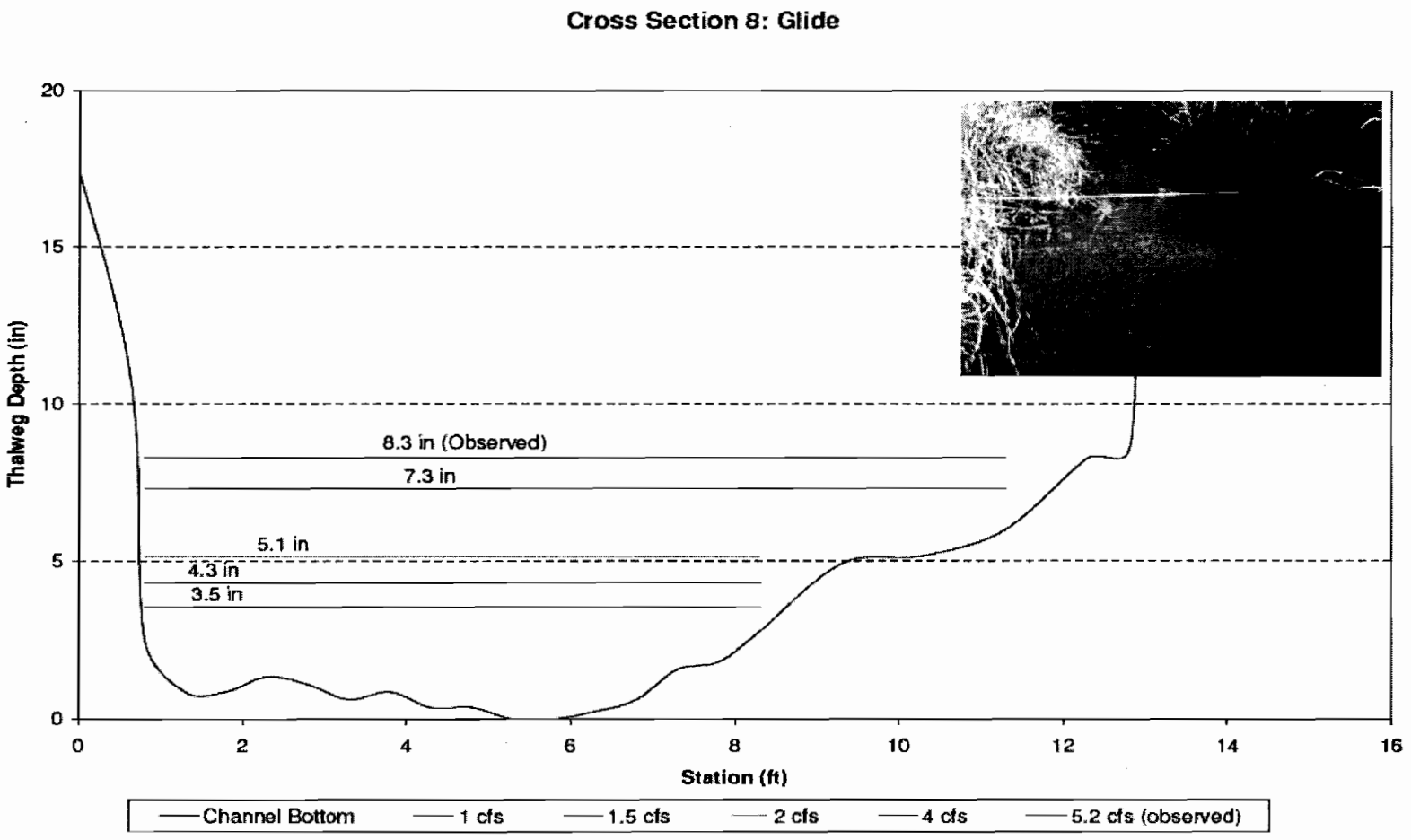


Figure 10. Cross-section profile of Horn Creek and extrapolated water elevations based on multiple water withdrawal scenarios.

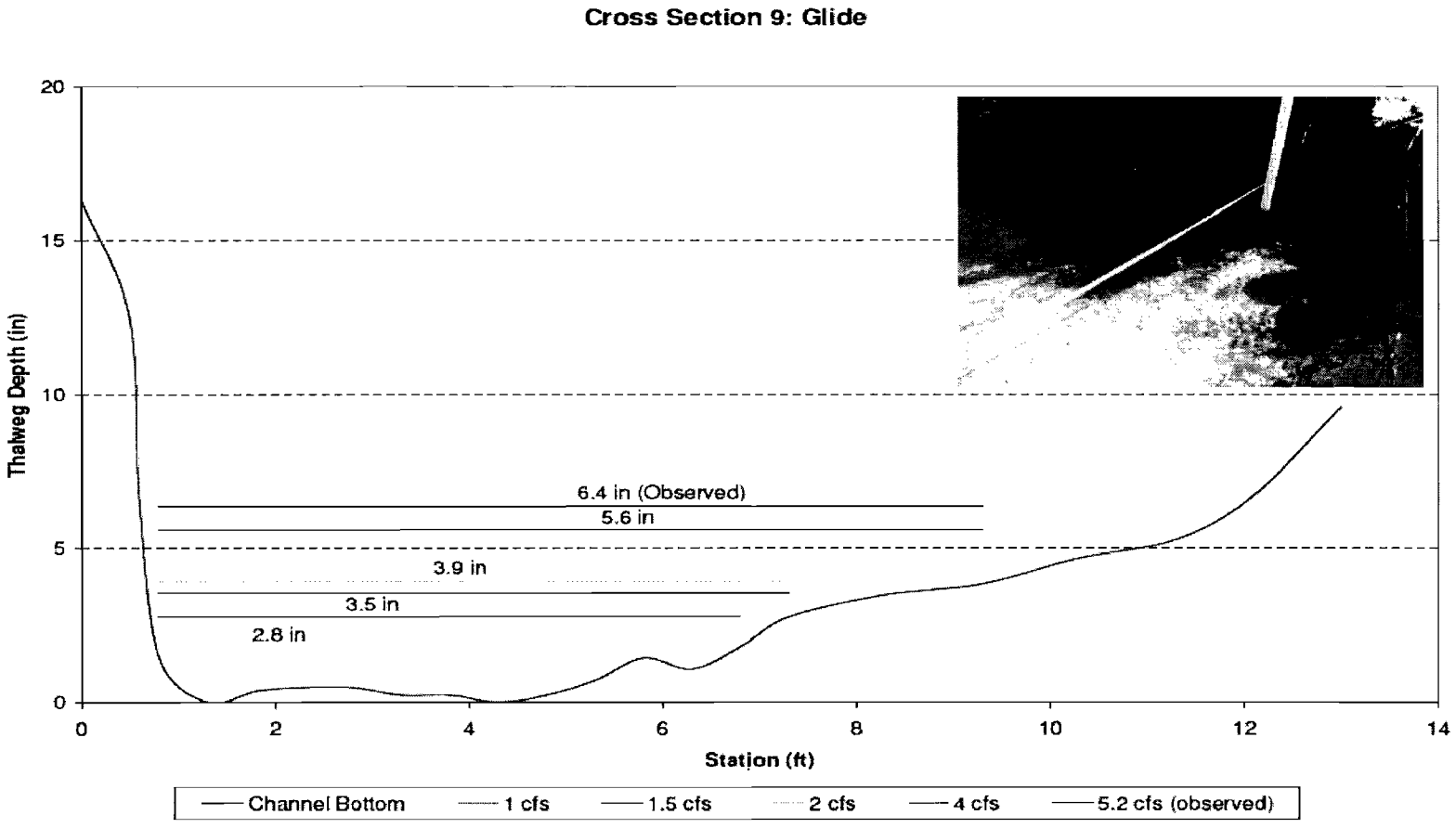


Figure 11. Cross-section profile of Horn Creek and extrapolated water elevations based on multiple water withdrawal scenarios.