

**Date:** January 24, 2014  
**To:** Joy Klushkan (YRAA)  
**c:**  
**From:** Don Beard, Bridget LaPenter (Tetra Tech)  
**Project No./Name:** YRAA Hatchery Siting  
**Subject:** Preliminary Report

---

This memo includes our preliminary findings regarding a possible hatchery in the Yakutat area. We hope that providing this information now will allow you and your board members to give us your thoughts on the best approach to completing our report.

- In Table 1 below, we have developed approximate sizing and water flows for the major fish culture components of facilities with incubation capacities of 10 million, 20 million and 40 million eggs.
- In Tables 2 and 3 below, we have developed a format for estimating the project costs. Before we complete the estimates, we would appreciate the opportunity to review construction costs in Yakutat with you and your staff. We recognize that costs can vary widely depending on how YRAA undertakes the construction. If you have specific contractors in mind, or if some of the work may be performed by your board or staff, it would be helpful to get that information before we estimate costs.
- Also attached are the following drawings:
  - C-100 Hatchery Concept Plan
  - C-101 West Addition Location
  - C-102 Broken Oar Cove Location
  - C-103 Redfield Cove Location
  - C-104 Cold Storage Location

We hope that this information, combined with the draft water supply report, is helpful to you. If you would like to discuss any elements of the project with us, please let us know. Thank you.



Table 1

Yakutat Regional Aquaculture Assn  
Central Incubation Facility  
Fish Culture Design Criteria

% Recirc Incub 0%  
% Recirc Fry Pond 0%  
User Inputs

Option	Species	INCUBATION							FRY PONDING ***						NET PEN REARING												
		Egg Capacity	Type	Eggs/Inc	No. Inc	Inc per stack	No. Stacks	Stack GPM	Total GPM	Unit *	Number	Vol [M <sup>3</sup> ]	Flow** [GPM]	Max GPM	Fry No.	Fry Final Wt [g]	Biomass [Kg]	Density [Kg/M <sup>3</sup> ]	Unit **	Volume of Each [M <sup>3</sup> ]	Number of Pens at 3M fry each	Total Volume [M <sup>3</sup> ]	Total Fry at 95% Survival	Fry Final Wt [g]	Biomass [Kg]	Density [Kg/M <sup>3</sup> ]	
Enhancement	Chum	10,000,000	Nopad	180,000	56	6	10	20	200	Raceway	1	40	176	176	1,500,000	0.4	600	15.0	40x40x15	680	4	680	9,500,000	2.0	19,000	7.0	
	Chum	10,000,000	Nopad	180,000	56	3	19	15	285										40x40x15	680	4	680	9,500,000	2.0	19,000	7.0	
	Chum	20,000,000	Nopad	180,000	112	6	19	20	380										40x40x15	680	7	680	19,000,000	2.0	38,000	8.0	
	Chum	20,000,000	Nopad	180,000	112	3	38	15	570											40x40x15	680	7	680	19,000,000	2.0	38,000	8.0
	Chum	40,000,000	Nopad	180,000	223	6	38	20	760											40x40x15	680	14	680	38,000,000	2.0	76,000	8.0
	Chum	40,000,000	Nopad	180,000	223	3	75	15	1125											40x40x15	680	14	680	38,000,000	2.0	76,000	8.0
	Pink	10,000,000	Nopad	300,000	34	6	6	20	120	Raceway	1	40	176	176	1,500,000	0.2	300	7.50	40x40x15	680	4	680	9,500,000	2.0	19,000	7.0	
	Pink	10,000,000	Nopad	300,000	34	3	12	15	180											40x40x15	680	4	680	9,500,000	2.0	19,000	7.0
	Pink	20,000,000	Nopad	300,000	67	6	12	20	240											40x40x15	680	7	680	19,000,000	2.0	38,000	8.0
	Pink	20,000,000	Nopad	300,000	67	3	23	15	345											40x40x15	680	7	680	19,000,000	2.0	38,000	8.0
	Pink	40,000,000	Nopad	300,000	134	6	23	20	460											40x40x15	680	14	680	38,000,000	2.0	76,000	8.0
	Pink	40,000,000	Nopad	300,000	134	3	45	15	675											40x40x15	680	14	680	38,000,000	2.0	76,000	8.0

\* Assume (1) 40x8x4 raceway for outmigration  
 \*\* Assume 1 change per hour max flow required.  
 \*\*\* Typically lasts 24 hrs with non-volitional outmigration  
 Chum typically pond at 0.3-0.4 g/fry  
 Pinks typically pond at 0.2 g/fry

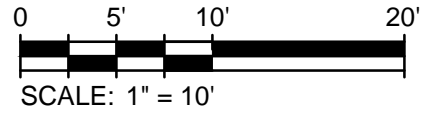
**Table 2**  
**Project Budget Estimates**  
**YRAA Hatchery**

Item No.	Item Description	20 million egg	40 million egg
A	Site Development	TBD	TBD
B	Water Supply and Drain Systems	TBD	TBD
C	Hatchery Building	TBD	TBD
D	Fish Culture Systems	TBD	TBD
E	Process Water Tempering System	TBD	TBD
F	Saltwater Rearing	TBD	TBD
G	Support Facilities (Office, lab, apartment)	TBD	TBD
H	Mobilization	TBD	TBD
	Estimated Construction Bid Amount		
	8% Design		
	1% Permitting		
	8% Construction Administration		
	3% YRAA Legal, Admin Costs		
	8% Construction Contingencies		
	Total Project Budget		

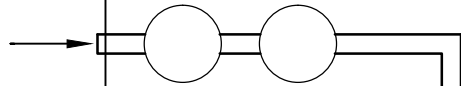
**Table 3**

**YRAA Hatchery  
 20 Million Egg Facility  
 Budget Item Details**

ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE	AMOUNT	SUBTOTALS	SUBTOTALS WITH EST CONTINGENCY
<b>Site Development</b>					\$0	\$0
1	Fill	cy	100	\$ -		
2	Foundation excavation and preparation	ls	1	\$ -		
3	Septic Tank, Drainfield	ls	1	\$ -		
4	Fuel tanks, pumps, piping	ls	1	\$ -		
5	Emergency Genset	ls	1	\$ -		
6	Communications, Alarms	ls	1	\$ -		
<b>Water Supply and Drain Systems</b>					\$0	\$0
1	Intakes at hillside springs	ea	4	\$ -		
2	Water supply piping	lf	300	\$ -		
4	Water supply piping, installation	ls	1	\$ -		
5	Head tank	ls	1	\$ -		
6	Gas Stabilization Tower	lf	1	\$ -		
7	Valves, misc fittings	ls	1	\$ -		
8	Drain system to saltwater	ls	1	\$ -		
<b>Hatchery Building</b>					\$0	\$0
1	Foundations	cy	30	\$ -		
2	Slab	cy	30	\$ -		
3	Pre-engineered metal bldg, installed	sf	1400	\$ -		
4	Mechanical, heat and vent	ls	1	\$ -		
5	Electrical, lighting	ls	1	\$ -		
<b>Fish Culture Systems</b>					\$0	\$0
1	Nopad Incubators	ea	112	\$ -		
3	40x8x5 alum raceway	ea	1	\$ -		
4	Gas Stabilization Tower	ea	1	\$ -		
5	Distribution Piping	ls	1	\$ -		
6	Shipping and installation	ls	1	\$ -		
<b>Process Water Tempering System</b>					\$0	\$0
1	Boiler or saltwater piping	ls	1	\$ -		
2	Circ pumps	ea	2	\$ -		
3	Heat exchangers	ea	1	\$ -		
4	Electrical	ls	1	\$ -		
5	Control system	ls	1	\$ -		
<b>Saltwater Rearing</b>					\$0	\$0
1	Wavemaster Frames, 40x40	ea	7	\$ -		
2	Nets	ea	7	\$ -		
3	Anchors	ls	1	\$ -		
4	Misc equipment, feed shed, etc.	ls	1	\$ -		
<b>Support Facilities (Office, lab, apartment)</b>					\$0	\$0
1	Office, laboratory, shops etc.	sf	500	\$ -		
2	Apartment	sf	1000	\$ -		
3	Office, laboratory finishes and furnishings	sf	1	\$ -		
<b>Mobilization</b>					\$0	\$0
		%	8%	\$ -	\$ -	\$0
				Subtotal	\$ -	
				20% Design/Estimating Conting	\$0	
				Estimated Construction Bid Amount	\$0	\$0

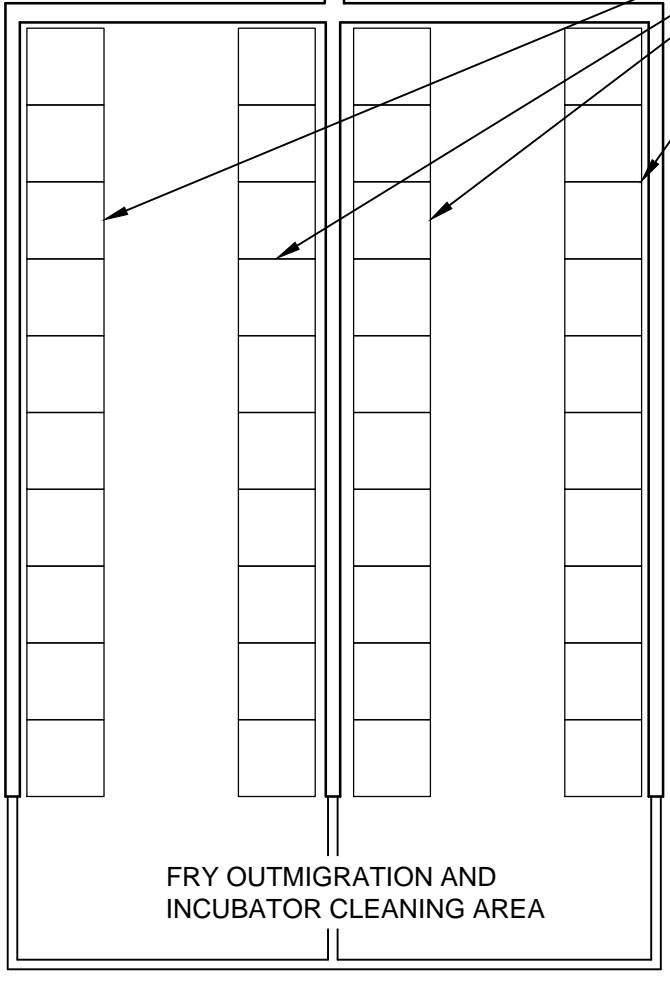


LABORATORY / OFFICE GROUND FLOOR  
STAFF APARTMENT SECOND FLOOR

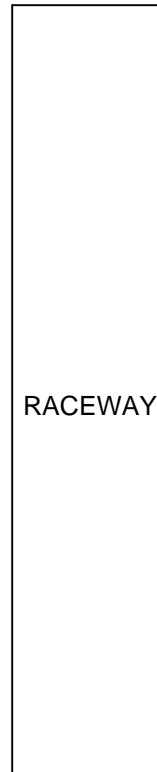


WATER SUPPLY  
AND TREATMENT

(40) NOPAD STACKS



FRY OUTMIGRATION AND  
INCUBATOR CLEANING AREA



RACEWAY

1/24/2014 5:05:30 PM - P:\97323\135-97323-14001\CAD\SHEETFILES\C-100 HATCHERY CONFIGURATION.DWG - LAPENTER, BRIDGET



**TETRA TECH**

www.tetrattech.com

230 S FRANKLIN ST, STE 212  
JUNEAU, AK 99801  
PH: 907.586.6400 FAX: 907.463.3677

YAKUTAT REGIONAL AQUACULTURE ASSOCIATION

HATCHERY CONCEPT PLAN  
CONFIGURED FOR 40 MIL CHUM EGGS

Project No.: 135-97323-14001

Date: 01-24-2014

Designed By: DRB

**C-100**

Bar Measures 1 inch

Copyright: Tetra Tech



**TETRA TECH**

230 S FRANKLIN ST, STE 212  
JUNEAU, AK 99801  
PH: 907.586.6400 FAX: 907.483.3877  
www.tetrattech.com

YAKUTAT REGIONAL AQUACULTURE ASSOCIATION

HATCHERY FACILITIES AT  
WEST ADDITION HYDRANT LOCATION

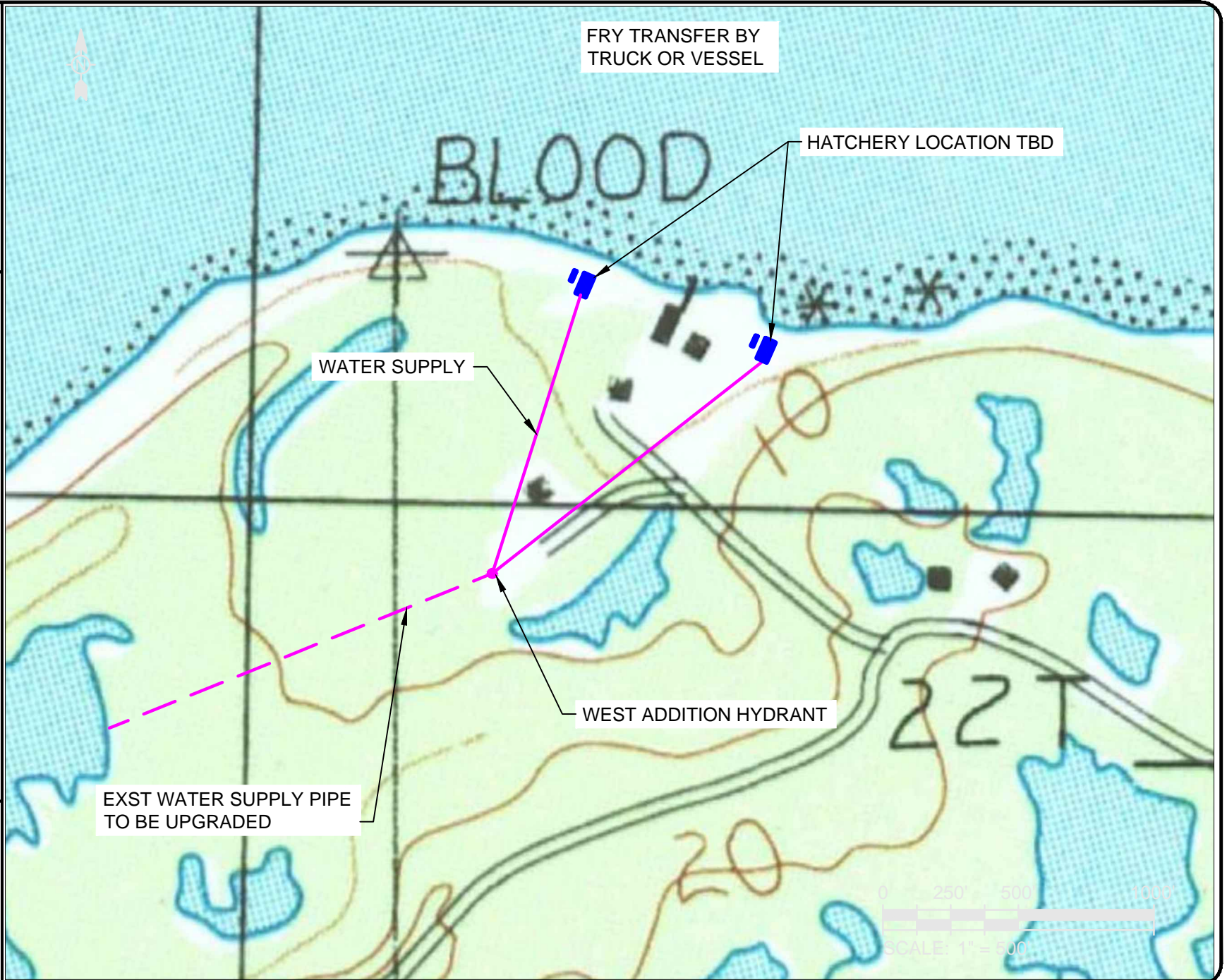
Project No.: 135-97323-14001

Date: 01-24-2014

Designed By: DRB

C-101

Bar Measures 1 inch





**TETRA TECH**

230 S FRANKLIN ST. STE 212  
JUNEAU, AK 99801  
PH: 907.586.6400 FAX: 907.483.3877  
www.tetrattech.com

YAKUTAT REGIONAL AQUACULTURE ASSOCIATION

HATCHERY FACILITIES AT  
BROKEN OAR COVE LOCATION

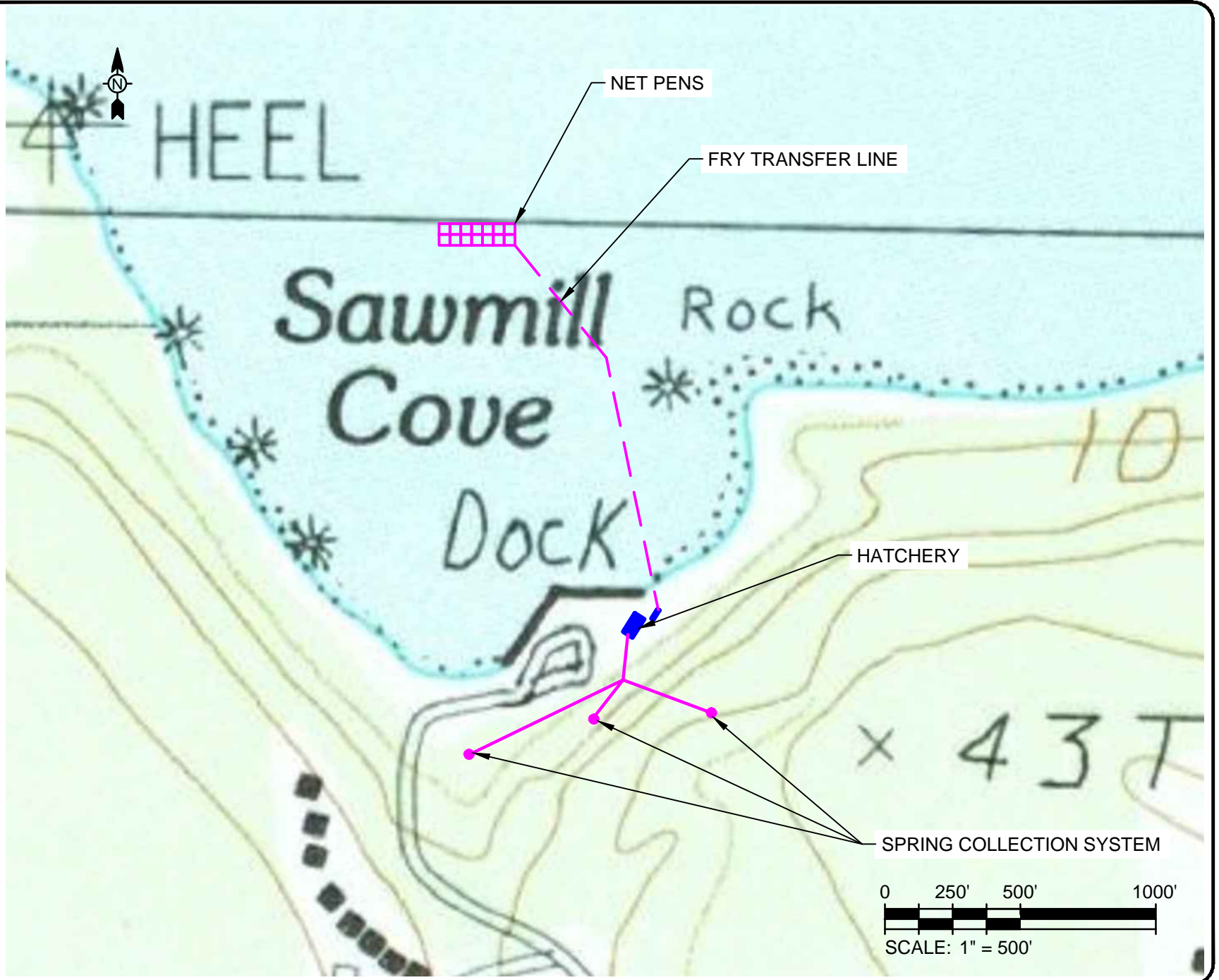
Project No.: 135-97323-14001

Date: 01-24-2014

Designed By: DRB

C-102

Bar Measures 1 inch





**TETRA TECH**

www.tetrattech.com

230 S FRANKLIN ST. STE 212  
JUNEAU, AK 99801  
PH: 907.586.6400 FAX: 907.463.3677

YAKUTAT REGIONAL AQUACULTURE ASSOCIATION

HATCHERY FACILITIES AT  
REDFIELD COVE LOCATION

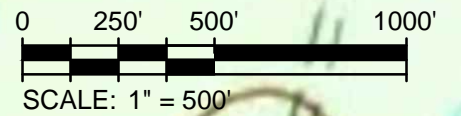
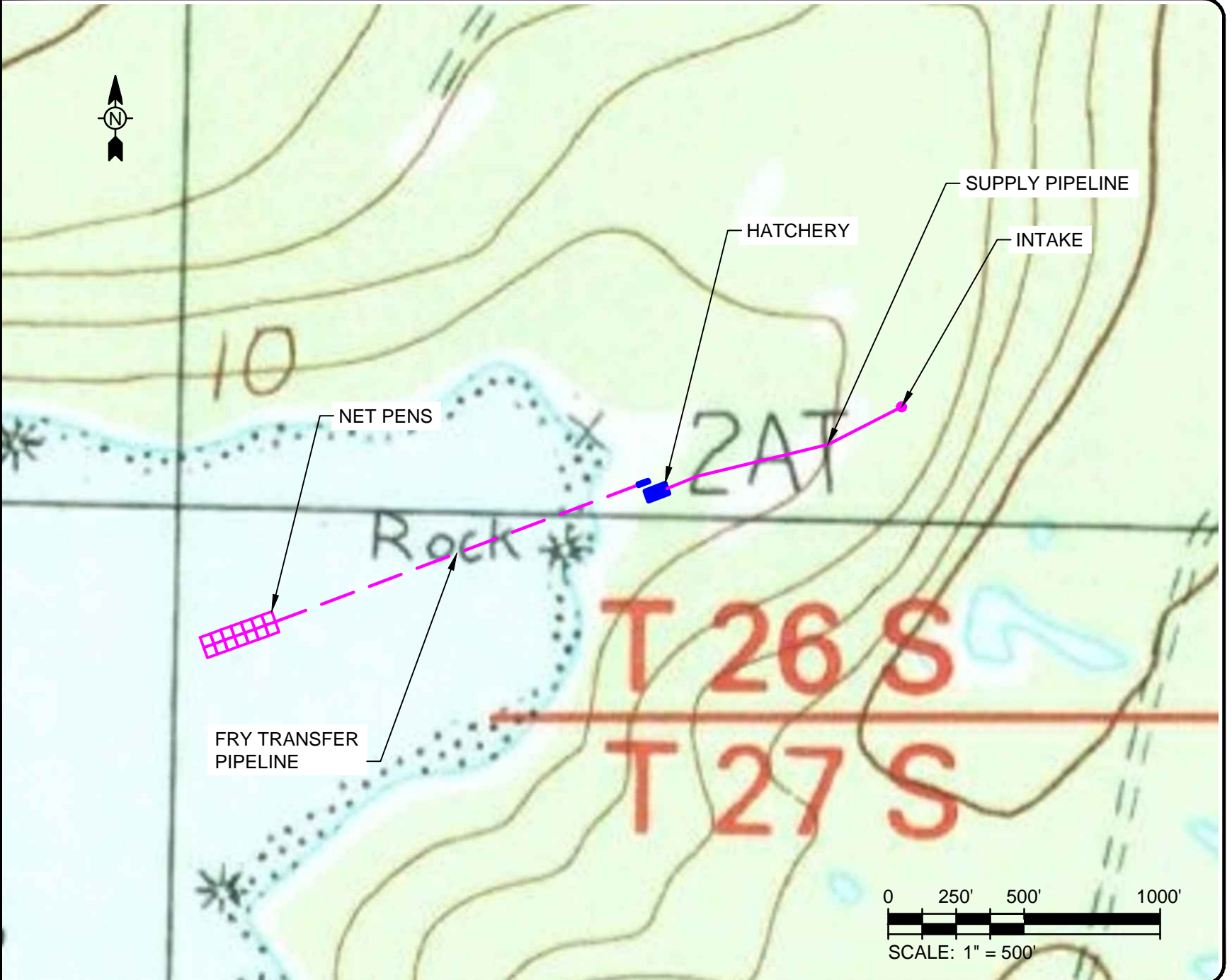
Project No.: 135-97323-14001

Date: 01-24-2014

Designed By: DRB

C-103

Bar Measures 1 inch





FRY TRANSFER BY TRUCK OR VESSEL

HATCHERY

EXST WATER SUPPLY TO TANK

YA-22  
BM 14.5

BOLD

Tank

Water Tank

Tank

0 250' 500' 1000'

SCALE: 1" = 500'

1/24/2014 4:28:03 PM - P:\97323\135-97323-14001\CAD\SHEETFILES\C-104 COLDSTORAGE.DWG - LAPENTER, BRIDGET



**TETRA TECH**

www.tetrattech.com

230 S FRANKLIN ST, STE 212  
JUNEAU, AK 99801  
PH: 907.586.6400 FAX: 907.463.3677

YAKUTAT REGIONAL AQUACULTURE ASSOCIATION

HATCHERY FACILITIES AT  
COLD STORAGE LOCATION

Project No.: 135-97323-14001

Date: 01-24-2014

Designed By: DRB

C-104

Bar Measures 1 inch

Copyright: Tetra Tech