APPLICATION
PRIVATE NONPROFIT SALMON HATCHERY PERMIT
STATE OF ALASKA
DEPARTMENT OF FISH AND GAME

COMMERCIAL FISHERIES DIVISION
P.O. Box 25526
JUNEAU, ALASKA 99802-5526

GENERAL INSTRUCTIONS

1. Fill in the blanks on the form provided.

2. Where necessary to fully answer a particular question, attach additional pages marked with the corresponding appendix number in the application.

3. Applications **Must Be Typed**.

4. Applications must be signed by the legally authorized representative of the corporate applicant.

5. The application should be sent to the following address:

   STATE OF ALASKA
   DEPARTMENT OF FISH AND GAME
   COMMERCIAL FISHERIES DIVISION
   P.O. Box 25526
   JUNEAU, ALASKA 99802-5526

   ATTENTION:
   PNP HATCHERY PROGRAM MANAGER

6. Requests for assistance in preparation of the application or related activities should be directed to the Program Manager. Such requests will be honored to the extent available staff time and funds permit.

7. This application must be accompanied by a **management feasibility analysis** prepared by the department in accordance with 5 AAC 40.130.

8. The application must be accompanied by a $100 nonrefundable application fee, in accordance with AS 16.10.400.

APPLICATION
PRIVATE NONPROFIT SALMON HATCHERY PERMIT

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME

I. IDENTIFICATION OF APPLICANT

A. Private Nonprofit Corporation

Name: Sustainable Salmon Institute (SSI)

Address: 9720 Trappers Lane
Juneau, Alaska 99801

Phone: (907) 789-5070

(Please attach a copy of Articles of Incorporation for the above nonprofit corporation organized in accordance with Alaska Statute 10.20)

See attached Appendix A: Nonprofit Entity Documents.

B. Individual Completing This Form

Name: Dale Young

Address: 9720 Trappers Lane
Juneau, Alaska 99801

Phone: (907) 209-2311

C. Relation to Above Nonprofit Corporation

Registered Agent

Baranof Salmon Facility (BSF)

II. STATEMENT OF APPLICANT'S GOALS AND OBJECTIVES

Explain why you have decided to apply for a hatchery permit and what you generally expect to accomplish by the operation of the proposed hatchery.

Goal

The goal of the Sustainable Salmon Institute (SSI) is to build and operate a "state of the art" salmon enhancement and research facility at Baranof Warm Springs in three phases. This facility will help address production capacity limitations of other facilities, improve common property salmon fisheries for pink, chum and coho, and especially those focused on Chinook. SSI aspires to achieve a variety of conservation objectives while making significant economic contributions to the region.

History

In 1976, the Baranof Lake watershed, coupled with the geothermal hot springs, all located at the headwaters of Warm Springs Bay, was identified as the top fisheries enhancement site in Alaska. It was further labeled a "World Class Aquaculture Site" by ADF&G. The 2002 DNR Northern Southeast Area Management Plan lists Baranof Warm Springs as a Special Management Area in the Sitka Coastal Management Plan and considers it to have "World Class" aquaculture potential. In 1977, ADF&G passed on developing this valuable site during the first round of the FRED Div. enhancement projects, in order to apply knowledge gained from other first round projects,

such as Hidden Falls Hatchery, to later development of the Baranof project. Before this could happen, FRED Div. was eliminated.

In 1986 ADF&G had another opportunity to develop the site after receiving U.S / Canada Salmon Treaty Mitigation Funds. The Department listed Baranof as a category "A" opportunity in the Comprehensive Salmon Plan. ADF&G proposed a joint venture with NSRAA, and the project received the highest score of all projects considered for mitigation funding. After considerable debate and competition for the available mitigation funds, ADF&G chose to distribute the money to a variety of smaller enhancement opportunities spread throughout Southeast Alaska. The State and NSRRA have since abandoned plans to build a facility at Baranof. It remains the single best site for salmon enhancement in the State, due to its location, water volume and two technological advantages that will make it more economical to operate than most other facilities: hydro-electric and geothermal energy potential.

Fish

SSI understands that the Department will be the final arbiter of the stocks selected for propagation at Baranof, however, we suggest the following stocks should receive strong consideration.

Pink- To address concerns about the effect of straying, SSI would like the Department to consider use of pink stocks from the streams located in Warm Springs Bay. Use of this stock would alleviate concerns about diminishing the genetic integrity of this stock through the introduction of other stocks at the facility and would make use of fish which have successfully evolved to returned to this location. It may take several life cycles to establish some production capacity because the number of available eggs at start up will be limited. But, eventually this stock will build to production levels, and it will be genetically identical to the local streams.

Chum and Coho- Chum and coho broodstock have been successfully developed at Hidden Falls Hatchery and Armstrong Keta Hatchery. SSI hopes to be approved by ADF&G to use stocks from one or both of these facilities. These stocks meet Department criteria for proximity and have been raised with good success.

Chinook- Although open to other directives, SSI is very excited by the prospect of raising Chinook from the Keta River stock. Initial reports from Little Port Walter, where that stock is being developed, are very favorable with regard to both the number of returning fish and their individual body size relative to other Chinook returns in the region. Keta Chinook at Little Port appear to be bucking the regional trend in both these regards suggesting that they may have the potential, either genetically or by virtue of phenotype, to overcome the challenges currently facing other regional Chinook stocks. Keta River Chinook have always run large in body size, due most likely to adaptations which have occurred to successfully spawn in deep, swift water with large- sized spawning aggregate in the Keta River. These large fish also exhibit high fecundity, which from an enhancement perspective means fewer fish are necessary for broodstock recovery and more fish are available to common-property fisheries. Given the naturally high incidence of zero-check Chinook in the Keta River and the geothermal advantages of the Baranof location, there is very strong potential for successful production of zero check Chinook at Baranof. This will allow for the production of large numbers of Chinook in a very cost-effective manner. Keta Chinook are an inside-waters rearing stock which will help supplement Troll and Sport fisheries throughout Southeast Alaska year round.

SSI believes that through directed commercial and sport fisheries, terminal fisheries and the production of strong numbers of Coho and Chinook at Baranof, there is excellent potential to shift harvest pressure away from both wild Coho stocks generally, and depressed Chinook runs on the Mainland, and also away from both Coho and Chinook stocks transiting outside waters. The ability to do so, will provide opportunities for more flexibility in fisheries management and treaty allocations while still affording stakeholders excellent economic benefit. SSI feels that if timed appropriately, directed terminal fisheries for all species produced there, can be undertaken at Baranof with minimal impact on other existing fisheries or stocks in adjacent waters.

Central Incubation

SSI intends to design the facility with a vision to the future. In addition to the main goal of enhancing pink, chum, coho and Chinook, this facility will be capable of functioning as a central incubation and rearing facility for remote releases. In the future, if called upon by the Department or one of the Regional Associations, it could incubate and rear multiple species of salmonids, serving all of SE Alaska. With the flexibility to culture salmonids in a disease free environment, this could be a powerful tool for stock enhancement or rehabilitation projects. SSI plans to work closely with ADF&G and will have the ability to adapt to changes, over time, in fish culture techniques, harvest management strategies or enhancement goals as directed by the Department

In addition to producing large numbers of pink, chum, coho and Chinook for enhancement, the flexibility and special features of this culture complex will make it an ideal center for conducting fisheries research. One of SSI's main goals is to advance the knowledge base for Alaskan salmonids by providing facilities and by cooperating with other agencies on fisheries education and research projects.

The facility location is remote, but it still receives a high volume of tourist traffic during the summer months. This tourist traffic is expected to increase over time. The facility design will make provisions for interpretive viewing for visitors in order to promote public awareness and understanding about Alaskan salmon resources.

SSI will work with ADF&G managers to design and maintain an open traffic corridor in the terminal harvest area at the mouth of the bay, thus guaranteeing free vessel passage during any THA or SHA harvest openings.

SSI believes the multifaceted Baranof facility will eventually contribute approximately 1,080,000 pinks, 1,080,000 chums, 840,000 coho and 60,000 Chinook salmon to the common property fisheries of Alaska. These enhancement salmon are projected to provide a stable, long-term increase to the Alaskan economy. The project will create an estimated 40 permanent jobs, 55 seasonal jobs and support many additional regional jobs throughout SE Alaska. Within several years of reaching full capacity, the project should attain the goal of 100% self sustained operations and be able to repay all loans via sales from cost recovery fish. This would all be made possible by concentrating untapped energy sources and converting them into a high value fisheries product that can enter into our socio-economic system. The hydro and geothermal water energy sources currently flow into the Pacific Ocean in raw form and dissipate without having any impact on the economy. Long after Alaskan oil, gas and mineral resources have been substantially extracted, the renewable energy and fisheries resources from this facility should

continue to flourish. The project will benefit commercial fishermen, fish processors, fish wholesalers, charter boat operators, sports fishermen, the tourist industry, the transportation industry, academic institutions and numerous businesses that support these industries. The project should also please biologists, conservationists and environmentalists who place a high value on protecting the strength and genetic diversity of wild salmonids.

SSI requests permission to consider the Chinook and coho portion of the hatchery capacity as a combined total capacity with the ability to increase either species to offset a shortfall of egg take in the other species. This is most likely to come into play if the Chinook egg take was under the limit, there would still be time to fill that capacity with coho at a later date due to the later timing of the coho returns. It is desirable to operate the facility near capacity in order to accelerate repayment of project loans. SSI will refine it's long term production proforma after analyzing data from Phase I returns. Phase I is intended to serve as a broodstock development facility with sufficient cost recovery fish to cover debt service. This permit application is for Phase I. Phases II and III are provided to illustrate anticipated future production via permit alteration requests.

III. PRODUCTION GOALS AND HATCHERY SITE INFORMATION

A. Egg Capacities by species

		millions of eggs required for hatchery
Phase I Facility	Pink	2
Phase II Facility	Pink	20
Phase III Facility	Pink	100
Phase I Facility	Chum	10
Phase II Facility	Chum	80
Phase III Facility	Chum	100
Phase I Facility	Coho	2
Phase II Facility	Coho	25
Phase III Facility	Coho	25
Phase I Facility	Chinook	.5
Phase II Facility	Chinook	2
Phase III Facility	Chinook	10

B. Location Description

1. Site (stream and/or lake name, ADF&G stream number, and exact geographical coordinates)

The water source is Baranof Lake on Baranof Island, AK at (lat. 57° 05' N., long. 134 ° 51' W.)

Phase I&II hatchery sites are in the Baranof Town-site at (lat. 57° 05' 21" N., long. 134 ° 50' W.)

Phase III hatchery site is in and West of the salt chuck lagoon at (lat. 57° 05' N., long. 134° 50' W.)

2. Site Physical Description (attach topographic map and photographs of proposed site).

a. Topography

The Phase I building site is on a combination of patented tidelands and uplands. The site consists of a gently sloping gravel beach area formerly used as a grid for boat repair. Part of the site has been surveyed as accreted upland. It is currently vacant and has been cleared of debris and remnants of the former grid. The site was explored during cleanup and it was determined to be tightly consolidated beach gravel with mixed rocks deposited over bedrock.

The Phase II building site is located on private uplands in the Baranof townsite on the north side of the existing boardwalk near the public dock. It is partly flat land that has been previously cleared and graded and partly steep rocky and wooded hillside that would need to be cleared and excavated to complete the site pad.

The Phase III building site would be in the area of the Salt Lagoon on the South side of Warm Springs Bay directly across the bay from the public dock. The primary building site would be in the extreme South end of the lagoon on a large flat area of bedrock and beach gravel. Part of the site would be excavated from adjacent sloped hillsides to generate fill for the tidelands area of the site. If for any reason the Phase I site is determined to be unusable, the Phase II and or Phase III sites would become the sites for all project Phases.

Detailed geotechnical surveys will be conducted prior to final building design on all three sites in order to guarantee solid foundations and take maximum advantage of existing rock and fill materials.

See attached Appendix B:

1. Baranof Aerial Photo
2. Baranof Lake Dam Site Map
3. Baranof Lake Outlet Topo Map
4. Baranof Lake Topo Map
5. USGS Quadmap Sitka A-3
6. Phase I & II Site Aerial Photo
7. Phase I & II Rendering
8. Phase III Site Aerial Photo.

b. Geology

Geology reference is described by: Soward, Kenneth S. (1961). Geology of Waterpower Sites in Alaska: Geologic Investigations of Proposed Powersites at Baranof and Carbon Lakes, Baranof Island, Alaska. Geological bulletin 1031-B. Baranof Warm Springs is located on the southern part of a 34-mile long, 5 to 10 mile wide exposure of biotite-quartz diorite batholith that crosses northern Baranof Island.

See the attached Appendix C:

Geologic Investigations of Proposed Powersites at Baranof and Carbon Lakes, Baranof Island, Alaska.

c. **Soils**

Phase I site soils consist primarily of glacially deposited and beach eroded weathered diorite rock, sand, gravel and boulders with a very thin cover of finer organic sandy silty soil forming on top of this deposit in the small area of accreted upland.

C. **Current Land Use and Ownership Status**

1. **Have the land or usage rights been acquired?**

Phase I private property sites are owned by Dale Young. Hawken has submitted lease applications to DNR for additional land and nearby tidelands.

2. **What is (will be) the legal form of any usage rights?**

Phase I private patented tidelands or possibly private land leases.

3. **List the additional state and federal permits needed by the applicant to build and operate the proposed hatchery. Examples may include: U.S. Army Corps of Engineers Permit; Department of Natural Resources Water Use, Land Use, and Tidelands Lease Permits; and U.S. Forest Service Land Use Permit.**

Use Permits (land and water)

Phase I will require the following permits and leases: U.S. Army Corps of Engineers permit; Department of Natural Resources water rights certification and tidelands lease; State Fire Marshal review; Department of Environmental Conservation solid waste, potable water, sewage treatment, wastewater and discharge permits; Alaska Department of Fish and Game fish/egg transport permit and this PNP hatchery permit. Phase I is on private patented tideland and or private land owned by Dale Young. Dale Young has an existing water right permit LAS 27397 for Phase I. Dale Young has existing pipelines and rights-of-way for multiple pipelines from Baranof River to the Phase I site. Hawken has applied to DNR for additional land easements to extend Phase I pipelines into Baranof Lake. Dale Young has also applied for additional hot and cold water rights sufficient to operate all proposed phases of the facility.

See attached Appendix D:

5. Sitka Utilities Easement Application
6. FERC Declaration of Intention.

D. **Water Supply**

The water quantity, minimum and maximum temperatures, and the amounts of silt loading will be critical factors in the evaluation of water supply adequacy. **Care should be exercised in the evaluation of these questions.**

1. **Source (e.g., lake, stream, well, spring).**

Baranof Lake

2. **Water source characteristic (e.g., substrate, size of drainage area, gradient, ground water characteristics).**

The Baranof watershed is 32 square miles of high gradient alpine mountains. The entire area consists biotite-quartz diorite rock that has been shaped and formed by glacial activity to create Baranof Lake. The exposed bedrock is very dense causing much of the surface water to drain quickly into the lake. There are some glacial alluvial streams in the headwaters to the lake. The lake is 3 miles long and 303 feet deep. The surface elevation is 145 feet.

See attached Appendix C:
Geologic Investigations of Proposed Powersites at Baranof and Carbon Lakes Baranof Island, Alaska.

See attached Appendix I:
1. State Hatchery Application
2. McCutcheon Hatchery Application.

3. **Water quality characteristics (in every case, cite the qualifications of the individual making the assessment and the method(s) used).**

a. **Recommended parameters to measure for evaluating potential hatchery water supply. Either fill out the table below or attach a copy of the water quality analysis conducted.**

See attached Appendix E:
Water Chemistry.

See attached Appendix I:
1. State Hatchery Application
2. McCutcheon Hatchery Application.

Water Qualities	Standards	Levels for the hatchery water source
Alkalinity	at least 20 mg/L as $caCO_3$	
Ammonia (unionized)	<0.0125 mg/L	
Arsenic	<0.05 mg/L	
Barium	<5.0 mg/L)	
Cadmium	<0.0005 mg/L (< 100 mg/L alkalinity <0.005 mg/L (≥ 100 mg/L alkalinity)	
Carbon dioxide	<1.0 mg/L	
Chloride	<4.0 mg/L	
Copper	<0.006 mg/L (< 100 mg/L alkalinity) <0.03 mg/L (≥ 100 mg/L alkalinity)	
Dissolved oxygen	>8.0 mg/L	
Hydrogen sulfide	<0.003 mg/L	
Iron	<0.1 mg/L	
Lead	<0.02 mg/L	

Magnesium	<15 mg/L
Mercury	<0.0002 mg/L
Nickel	<0.01 mg/L
Nitrate (NO_3)	<1.0 mg/L
Nitrate (NO_2)	<0.1 mg/L
Nitrogen (N_2)	<110% total gas pressure (<103% nitrogen gas)
Petroleum (oil)	<0.001 mg/L
pH	6.5 - 8.0
Potassium	<5.0 mg/L
Salinity	<5.0 ppt
Selenium	<0.01 mg/L
Silver	<0.003 mg/L (fresh water) <0.003 mg/L (salt water)
Sodium	<75.0) mg/L
Sulfate SO_4^{-2}	<50.0 mg/L
Total dissolved solids	<400.0 mg/L
Total settleable solids	<80.0 mg/L (25 JTU)
Zinc	<0.005 mg/L

Note: Synergistic and antagonistic chemical reactions must be considered when evaluating a water source against these criteria.

b. Attach a temperature profile (minimum of one year of data) of the hatchery water source. Also, provide vertical profiles if a lake water source is proposed.

See attached Appendix F:
Water Temperature, Oxygen, pH and Conductance.

See attached Appendix H:
Water Discharge, Conductance, pH and Temperature.

See attached Appendix I:
1. State Hatchery Application
2. McCutcheon Hatchery Application.

c. List monthly levels of dissolved oxygen in the hatchery water source. If a lake source, provide seasonal oxygen profiles.

See attached Appendix F:
Water Temperature, Oxygen, pH and Conductance.

See attached Appendix H:
Water Discharge, Conductance, pH and Temperature.

See attached Appendix I:
1. State Hatchery Application
2. McCutcheon Hatchery Application.

d. If a lake source, provide information on surface area, depth, and water storage capacity.

Baranof Lake has an area of 698 acres. It has a drainage area of 32 square miles. It is 300 feet deep. The surface is 145 ft. above mean sea level. It's planned usable storage capacity is approximately 24,430 acre feet.

See attached Appendix I:
1. State Hatchery Application
2. McCutcheon Hatchery Application.

e. Describe the silt load (include consideration of possible seasonal high water).

Baranof Lake contains trace amounts of glacial flour originating from glacial activity high in the watershed, but the lake acts as a long settling basin. By the time water reaches the lake outlet, it is very clear.

See attached Appendix I:
1. State Hatchery Application
2. McCutcheon Hatchery Application.

4. <u>Water Flow Data</u>.

This information should be based on the equivalent of long-term USGS stream gauge data (10 years or more data) or the U.S. Forest Service Water Resources Atlas synthetic hydrograph model.

a. Attach a seasonal profile, including yearly minimum and maximum flows.

See attached Appendix G:
1. Baranof River 30 Year Hydrograph and Facility Flow
2. Facility Seasonal Flow & Rearing Data Phase I

See attached Appendix I:
1. State Hatchery Application
2. McCutcheon Hatchery Application.

b. List a historical range of water flow conditions, if available.

See attached Appendix G:
1. Baranof River 30 Year Hydrograph and Facility Flow

See attached Appendix I:
1. State Hatchery Application
2. McCutcheon Hatchery Application.

5. Water Distribution System

Describe the water distribution system in at least the following dimensions:

a. Type, size, elevation and locations of water intake, screening, and water use/reuse system.

Phase I Facility may use an accessible, well-screened intake in the Baranof River, properly sized for the existing 10 inch HDPE pipe flows and velocities. This 10 inch cold water HDPE pipeline and a 4 inch hot water HDPE pipeline are already permitted and installed on existing easements. If time, permits and funding allow, Phase I intake will be extended into Baranof Lake with a larger diameter section of pipe and a deep water intake and one or two larger diameter pipes will be added for redundancy. If Phase I redundancy pipes are not installed, a pumped recirculation and filtration system will be used for emergency backup.

If a double pipeline system is installed, there will be both shallow water and deep water intakes. The exact elevations of the lake intakes will not be determined until final engineering design is completed. The intakes will be located in a manner to take full advantage of the lake temperature profiles in such a way as to be able to control water temperatures in the facility. Final design may dictate multiple medium sized pipes in lieu of single large pipes for each conduit. This will add redundancy and security to the water supply system and allow for single lines to be shut down for maintenance, while maintaining flow to the facility through the redundant lines. Intake screens will have low water velocities and will be designed to prevent large debris from entering the lines or impinging on the screens, but will not be fine screened in order to prevent underwater screen blockage that would be difficult to access and clean when the lake is frozen. Finer screens may be installed between the terminal end of the pipes and the head boxes if necessary. These would be accessible from within the facility building for easy cleaning. Phase I will use a single pass water systems for eyeing and incubation, but may use multiple pass water for part of the rearing systems.

See attached Appendix J:

1. Hot Water Pipeline Maintenance and Development Plan
2. Army Corps Permit Phase 1-3 Facility Drawings
3. FERC Phase I-III Pipeline Profiles
4. Phase I, II & III Facility Plans

b. Size, length, and type of pipe, insulation, and distribution system. Include elevations of water surfaces at each point in the system from intake through incubation and rearing to fish ladder or other discharge.

The pipelines will all be HDPE and they will be sized at time of final design. The lengths of the various lines are shown on the attached drawings. They will all draw from Baranof Lake, which has a surface elevation of 145 feet. All elevations throughout the system will be designed to run a total gravity flow production facility and discharge by gravity into Warm Springs Bay. The exact elevations within the facility will be established during the final design process. The plan for Phase I is to locate the incubation and start rearing tanks on the second floor of the facility, and have the main rearing tanks on the first floor of

the facility. This will enable a total gravity flow for moving various life stages of fish through the facility.

See attached Appendix J:

1. Hot Water Pipeline Maintenance and Development Plan
2. Army Corps Permit Phase 1-3 Facility Drawings
3. FERC Phase I-III Pipeline Profiles
4. Phase I, II & III Facility Plans

c. If a hydroelectric generation system will be used, will effluent from this system be used in the hatchery? If so, describe plans to address possible problems with gas supersaturation.

The degree of gas saturation will depend on the type of hydropower unit used. Sufficient accommodations for degassing will be included in the final design.

d. Describe provisions for an emergency water system in the event of primary water system failure.

The Phase I facility will be served by an existing 10" HDPE cold waterline and an existing 4" HDPE hot waterline. Hawken has applied for easements and land leases to install a double pipeline from the Phase I facility to Baranof Lake, thus providing a duplicate pipeline for primary use and emergency back up.

6. Water Treatment System

Describe any water treatment facilities that you will employ to meet minimal water quality standards (influent or effluent).

The Baranof Lake water quality is very clean and can be used untreated for normal incubation and rearing. The facility may be designed to treat part of the water with UV for disease free isolation incubation and rearing units for special projects. There will be sewage treatment facilities for domestic waste. If required by regulation and if economically feasible, there will be a suspended solids collection system built into the facility. This will increase the quality of the effluent and may make use of the fish waste by-product as a possible source for organic fertilizer.

7. Annual Water Budget

Attach a graph showing seasonal variation in flow required for eyeing, incubation, freshwater rearing, freshwater lens in saltwater pens, adult holding, and fish ladder operations.

The facility will be designed to operate on constant volume flows, making optimum use of available water for all stages of culture during periods of peak demand. The capacity of the facility has been reverse calculated by determining the maximum number of smolts, fingerlings and incubating eggs that can be produced in combination, with a given constant flow of available water. Phase I will have little impact on the watershed for most of the year. In the winter, during periods of low flow, water conservation measures may be needed to reduce the amount of lake draw-down. During these periods of low watershed recharge rate, aeration, oxygenation or water recycling may be used to fulfill the fish culture

requirements. Seasonal flows required for incubation, rearing are illustrated in appendix G 2 attached below. Maximum combined fish culture flow for Phase I is:

Phase I constant flow 18 cfs

See attached Appendices G:

1. Baranof River 30 Year Hydrograph and Facility Flow
2. Phase I Rearing Unit Budget

IV. HATCHERY DESIGN AND CONSTRUCTION INFORMATION

Describe the critical operational assumptions and objectives which determine the design size and capacity of the proposed hatchery. Specific reference should be made to the following (for reference, a table of CFMD assumptions for salmon survival is provided, Table I):

NOTE: All bio-criteria for stock selection, design and construction will be reviewed and confirmed by joint effort between SSI and ADF&G prior to final facility design.

A. Biocriteria for Design and Construction Phase I Pink Salmon

BROODSTOCK - SPECIES Warm Springs Bay Pink Salmon Wild Stock

1. Eggs per female spawner 1600
2. Brood stock requirements at 1:1 sex ratio 3125 Includes 5% holding mortality
3. Green egg requirements 2,000,000
4. Estimated holding mortality 156 at 5% mortality

HATCHERY FACILITY

5. Eyed eggs (10% loss from green egg stage) 1,900,000 eyed eggs
6. Eyed egg density per incubation unit 180,000
7. Total number of incubation units 11 stacks
8. Number of cabinets per unit 15
9. Water requirements at 19 L/min/unit= 209 L/min
10. Water requirements with 0 % loss= 209 L/min

FRESHWATER REARING UNITS

11. Number of emerging fry (5 % loss from eyed stage) 1,805,000
12. Initial fry weight at 4000/kg= 451.25 kg
13. Final Fry weight at 1000 /kg= 1805 kg
14. Initial freshwater fry rearing space required at 5 kg/m^3 90.25 m^3
15. Final freshwater fry rearing space required at 9 kg/m^3 200.5 m^3
16. Maximum number of rearing units (3 m dia. by 5 m high) silos = 6 @ 36
17. Maximum water requirements at 1.6357 kg/L/min and 10% loss 1103.5 L/min
18. Number of exchanges per hour (R-value) per raceway 1.84 required call it 1.84

PROJECTED RETURN

19. Number of returning fish at 2.00 % ocean survival = 36,000

A. Biocriteria for Design and Construction Phase I Chum Salmon

BROODSTOCK - SPECIES Chum From Hidden Falls or Armstrong Keta

1. Eggs per female spawner 2200
2. Brood stock requirements at 1:1 sex ratio 10,228 Includes 25% holding mortality
3. Green egg requirements 10,000,000
4. Estimated holding mortality 2557 at 25% mortality

HATCHERY FACILITY

5. Eyed eggs (10% loss from green egg stage) 9,000,000 eyed eggs
6. Eyed egg density per incubation unit 300,000
7. Total number of incubation units 30 R48s
8. Number of cabinets per unit N/A
9. Water requirements at 133 L/min/unit= 3,990 L/min
10. Water requirements with 0 % loss= 3,990 L/min

FRESHWATER REARING UNITS

11. Number of emerging fry (5 % loss from eyed stage) 8,550,000
12. Initial fry weight at 4000/kg= 2,137kg
13. Final Fry weight at 500 /kg= 17,100 kg
14. Initial freshwater fry rearing space required at 9 kg/m^3 237 m^3
15. Final freshwater fry rearing space required at 67 kg/m^3 255 m^3
16. Maximum number of rearing units (3 m dia. by 5 m high) silos = 7 @ 36
17. Maximum water requirements at 1.6357 kg/L/min and 10% loss 10,454 L/min
18. Number of exchanges per hour (R-value) per raceway 2.5

MARINE REARING UNITS

19. Number of fry/fingerling/or smolts 8,122,500
20. Initial weight at 500 /kg = 16,245 kg
21. Final weight at 250 /kg = 32,490 kg
22. Initial rearing space required at 6 kg/m^3 = 2,707 m^3
23. Final rearing space required at 7.9 kg/m^3 = 4,113 m^3
24. Maximum number of rearing units (12 m by 12 m by 4 m= 7 @ 576 m^3)

PROJECTED RETURN

25. Number of returning fish at 2.00 % ocean survival = 162,450

A. Biocriteria for Design and Construction Phase I Coho Salmon

BROODSTOCK - SPECIES Sashin Creek/ Deep Cove Coho via AKI, LPW or Hidden Falls

1. Eggs per female spawner 2800
2. Brood stock requirements at 1:1 sex ratio 1786 Includes 25% holding mortality
3. Green egg requirements 2,000,000
4. Estimated holding mortality 446 at 25% mortality

HATCHERY FACILITY

5. Eyed eggs (10% loss from green egg stage) 1,900,000
6. Eyed egg density per incubation unit 100,000
7. Total number of incubation units 19 R30s
8. Number of cabinets per unit N/A
9. Water requirements at 50 L/min/unit= 950 L/min
10. Water requirements with 0 % loss= 950 L/min

FRESHWATER REARING UNITS

11. Number of emerging fry (5 % loss from eyed stage) 1,805,000
12. Initial fry weight at 4000/kg= 451 kg
13. Final Fry weight at 66 /kg= 27,348 kg
14. Initial freshwater fry rearing space required at 9 kg/m^3 50 m^3
15. Final freshwater fry rearing space required at 30 kg/m^3 912 m^3
16. Maximum number of rearing units (3 m dia. by 5 m high) silos = 25@ 36
17. Maximum water requirements at 1.6357 kg/L/min and 10% loss 16,719 L/min
18. Number of exchanges per hour (R-value) per raceway 1.1

MARINE REARING UNITS

19. Number of fry/fingerling/or smolts 1,714,750
20. Initial weight at 66 /kg = 25,981 kg
21. Final weight at 40 /kg = 42,869 kg
22. Initial rearing space required at 6 kg/m^3 = 4,330 m^3
23. Final rearing space required at 7.9 kg/m^3 5,426 m^3
24. Maximum number of rearing units (12 m by 12 m by 3 m= 13 @ 432 m^3)

PROJECTED RETURN

25. Number of returning fish at 7 % ocean survival = 120,033

A. Biocriteria for Design and Construction Phase I Chinook Salmon

BROODSTOCK - SPECIES Keta River Chinook via Little Port Walter

1. Eggs per female spawner 6500
2. Brood stock requirements at 1:1 sex ratio 192 Includes 25% holding mortality
3. Green egg requirements 500,000
4. Estimated holding mortality 48 at 25% mortality

HATCHERY FACILITY

5. Eyed eggs (10% loss from green egg stage) 475,000 eyed eggs
6. Eyed egg density per incubation unit 105,000
7. Total number of incubation units 4.5 or call it 5 stacks
8. Number of cabinets per unit 15
9. Water requirements at 19 L/min/unit= 95 L/min
10. Water requirements with 0 % loss= 95 L/min

FRESHWATER REARING UNITS

11. Number of emerging fry (5 % loss from eyed stage) 451,250
12. Initial fry weight at 4000/kg= 112.8kg
13. Final Fry weight at 66 /kg= 6837 kg
14. Initial freshwater fry rearing space required at 9 kg/m^3 12.5 m^3
15. Final freshwater fry rearing space required at 30 kg/m^3 228 m^3
16. Maximum number of rearing units (3 m dia. by 5 m high) silos = 6.3 @ 36
17. Maximum water requirements at 1.6357 kg/L/min and 10% loss 4180 L/min
18. Number of exchanges per hour (R-value) per raceway 1.1

MARINE REARING UNITS

19. Number of fry/fingerling/or smolts 428,687
20. Initial weight at 66 /kg = 6,495 kg
21. Final weight at 50 /kg = 8,574 kg

    Alternate final weight at 25 /kg= 17,147 kg
22. Initial rearing space required at 6 kg/m^3 = 1083 m^3
23. Final rearing space required at 7.9 kg/m^3 1085 m^3

    Alternate final rearing space required at 7.9 kg/m^3 2,171 m^3
24. Maximum number of rearing units (12 m by 12 m by 4 m= 2 @ 576 m^3)

    Alternate maximum number of rearing units (12 m by 12 m by 4 m= 4@ 576 m^3)

PROJECTED RETURN

25. Number of returning fish at ___2_% ocean survival =___8,574_____

Table 1. Salmon survival goals at various life stages and fecundities[1] to use in budget documents and hatchery planning.

	Hatchery				Lake	Marine
Species	Green to eyed egg	Eyed Egg to emergent fry	Emergent fry to fingerling	Fingerling to smolt	Fry/fingerling to smolt	Survival to adult
Chum	.90 (.90)[2] .90 (.90)	.95 (.855)[3] .95 (.855)	.90 (.770)[4]			.007 (.006) .02 (.015)
Pink	.90 (.90) .90 (.90)	.95 (.855)[3] .95 (.855)	.90 (.770)[4]			.007 (.006) .02 (.015)
Coho	.90 (.90) .90 (.90) .90 (.90)	.95 (.855)[5] .95 (.855) .95 (.855)	.90 (.770)[6] .90 (.770)	.80 (.616)[7]	.10 (.086) .20 (.154)	.10 (.009) .10 (.015) .10 (.062)
Chinook	.90 (.90) .90 (.90) .90 (.90)	.95 (.855)[5] .95 (.855) .95 (.855)	.90 (.770)[6] .90 (.770)	.80 (.616)[7]	.10 (.086) .20 (.154)	.03 (.003) .03 (.005) .03 (.018)
Sockeye	.90 (.90) .90 (.90) .90 (.90)	.95 (.855)[5] .95 (.855) .95 (.855)	.90 (.770)[6] .90 (.770)	.80 (.616)[7]	.10 (.086) .20 (.154)	.10 (.009) .10 (.015) .10 (.062)

[1] Fecundities by species (eggs per female spawner).
Chum 2,200
Pink 1,600
Coho 2,800
Chinook 6,500
Sockeye 3,000

[2] Cumulative survivals in parenthesis.
[3] Fry to ocean.
[4] Fingerling to ocean.
[5] Fry to lake/stream.
[6] Fingerling to lake/stream.
[7] Smolt to ocean.

B. GENERAL DESCRIPTION

Attach a written description of the proposed facility. This description should represent a solid concept of the proposed hatchery design. Also include preliminary sketches and drawings of at least the following in an appendix.

1. Incubation and rearing site plan.
2. Hatchery floor plan.
3. Water supply system.
4. Incubation/operation building.
5. Facility layout.

Phase I details are contained in Appendices D 1. and J 1-4., see below. SSI anticipates receiving Phase I eggs from existing hatcheries. There are no plans for constructing adult holding or

spawning facilities for Phase I under the current plan. If plans change for any reason, Phase I may deploy temporary adult capture nets and floating adult holding pens with a fresh water supply. Any potential Phase I spawning facility would be set up on the Phase II site as a temporary facility much like a remote eggtake. Phases I,II and III as referenced in this application and the attached appendices represent schematic plans for proof of concept showing there is sufficient space to build the proposed facilities. After site survey and engineering information is completed, if necessary, the Phase I project may be relocated to the Phase *II* or Phase III site with appropriate final design tailored to whatever site is chosen.

See narrative in attached Appendix D:

1. Baranof DNR Land lease Application

See drawings in attached Appendices J:

1. Hot Water Pipeline Maintenance and Development Plan
2. Army Corps Permit Phase 1-3 Facility Drawings
3. FERC Phase I-III Pipeline Profiles
4. Phase I, II & III Facility Plans

The site plan should include a plan view of all facilities at a scale of 1:100 or larger, a USGS 1:63360 scale topographical map showing the entire watershed and all facility locations, and a NOAA marine chart of the largest scale available showing all tidewater-based facilities and local data.

See attached Appendix J:

1. Hot Water Pipeline Maintenance and Development Plan
2. Army Corps Permit Phase 1-3 Facility Drawings
3. FERC Phase I-III Pipeline Profiles
4. Phase I, II & III Facility Plans

C. PROPOSED CONSTRUCTION TIMETABLE

Prepare a timetable for the construction period which indicates the critical milestones for the project.

SSI plans to begin phase I design immediately upon approval of this permit, and anticipates Phase I construction will begin in the spring of 2018. Phase I construction should be completed in time to start incubating and rearing fish in 2020. There is planned slack time built into these design and construction estimates to allow for project acceleration if the project progresses smoothly, or conversely, there is also time planned for unforeseen delays, common on a project of this scale. The production and economic proformas contained in Appendices L 3 and 4 are based on the project proceeding in an orderly fashion with full approval, cooperation and support from the State and other government agencies. Any further delays or changes in dates and schedules will be indicated on project managements plans as the project proceeds.

See attached Appendix K:

1. Facility Construction Project Management Plan

V. BROODSTOCK

A. Initial Donor Stock

1. Identification of source.

Indicate stream name, ADF&G number or geographic coordinates, and salmon species for each proposed donor stock.

a. Species: Pink
Stock: Warms Springs Bay Streams

b. Species: Chum
Stock: Hidden Falls and/ or Armstrong Keta Hatchery Inc.

c. Species: Coho
Stock: Mixed ancestral stock, Sashin Creek/Deep Cove via LPW, Armstrong Keta, Inc. or Hidden Falls Hatchery
ADF&G number: 109-10

d. Species: Chinook
Stock: Ancestral Keta River stock via Little Port Walter

If more sources are being requested, attach an additional list.

2. **Capture techniques and holding facilities at the donor stream.**
   a. Capture techniques
   Describe in detail the capture techniques you will use to harvest adults and take eggs. Please provide a map identifying the exact location of the holding facilities.

   Eggs will come from existing hatcheries. No remote egg-takes are anticipated except for local pinks which will be captured, held and spawned using standard ADF&G methods.

   b. Holding facilities
   Describe the holding facilities to be used for donor stock spawners (include schematics). List the loading rate [kg fish/ (L/min)] and density (kg fish/mg^3).

   Eggs will come from existing hatcheries. No remote egg-takes are anticipated except for local pinks which will be captured, held and spawned using standard ADF&G methods.

3. **Transportation**
   Discuss method planned for transporting live fish and/or eggs.

   Eyed eggs will be packed in insulated egg shipping containers and transported by floatplane or vessel from LPW, Armstrong Keta, Inc. and/or Hidden Falls Hatchery, to Baranof.

4. **Spawning and fertilization**
   Discuss the spawning, fertilization, and disinfection procedures and the procedure for estimating percent fertilization.

   Spawning will be 1:1 male to female ratio, eggs will be fertilized, rinsed, hardened and disinfected with 1:100 Argentyne or other approved iodophor per ADF&G Pathology lab protocol. For Phase I, this process will be handled by the procedures used by the donor hatchery and approved by ADF&G. For Phase II the technique will be refined

for site specific efficiency and approved by ADF&G Fish Pathology and Genetics labs. The final method cannot be described until onsite information is acquired regarding any possible diseases such as BKD that may require special handling and management practices.

B. Broodstock Returning to Hatchery

1. Capture techniques and holding facilities at the hatchery.

a. Capture Techniques

Describe in detail the techniques you will use to capture and ripen adults and take eggs.

Lead nets, fish ladder and or Archimedes fish lift or Whoosh lift moving fish into adult holding raceways. Please refer to IV B for design details by Phase.

b. Holding facilities

Describe the holding facilities to be used for hatchery brood stock spawners (include schematics) and give the loading rate [kg fish/ (L/min)] and density (kg fish/mg^3).

Raceways with crowding screens and separate holding pens for sorting. Water flow will be exchanged at a rate of one volume per hour or greater depending on density of adults. Stocking density will be determined according to oxygen content of raceway water in addition to a physical loading density of 13kg per cubic meter. Please refer to IV B for design details by Phase.

2. Transportation

Discuss method planned for transporting live fish and/or eggs (if different from those described in Part A).

Same as in A above

3. Spawning and fertilization

Discuss the spawning and fertilization procedures (if different from those described in Part A).

Same as in A above

VI INCUBATION AND REARING PLAN

A. Incubators and Rearing Units

Describe the type of incubators and rearing facilities to be used.

Incubators will be Heath Tray type, Marisource Verticle Incubation Systems, R-30, R-48, NOPAD and / or custom fabricated, depending on species and number of eggs in spawning lot. Rearing will be in a variety of standard rearing units. There will be standard raceways, Swedish tanks, circular tanks and vertical raceways (silos) in different areas of the facility.

B. Egg Handling

Describe the method by which you plan to handle the eggs from the spawning process through planting them in incubators.

Phase I will receive eyed eggs from other hatcheries. They will be seeded into Heath tray or Marisource Verticle Incubation Systems type incubators through the emergent fry stage. The pink salmon will be from wild egg takes in Warm Springs Bay.

Phase II will use a modern custom designed spawning facility similar in concept to the custom spawning facility in use at DIPAC hatchery. The design will be tailored to fit into an efficient industrial flow from live spawner to fertilized, water hardened, rinsed

eggs and food grade processed carcasses. It will use electroshock stun technology, troughs or conveyers to move spawners by gravity or mechanically, multiple spawning stations all housed in a sanitary food grade environment. The eggs will be disinfected with an iodophore and the carcasses will be carefully processed and refrigerated, frozen or otherwise preserved to maintain some level of commercial sale value. The eggs will be volumetrically or electronically enumerated and incubated and hatched in cylindrical eyeing containers. Rinsed alevins may be electronically counted and seeded into incubators through the emergent fry stage. The type of incubators for Phase II has not yet been determined. At a minimum, the incubators will be Heath tray type as provided by Marisource Verticle Incubation Systems or NOPAD. SSI may have custom grid tray incubators fabricated, which would decrease operating costs and increase the survival rate and condition factor of the emergent fry. The type of incubator used will depend on any potential needs for individual family tracking of egg lots in order to manage for certain possible diseases such as BKD. This portion of the egg handling and incubation procedure will be developed cooperatively with fish pathology lab based on actual conditions at the facility and based on actual disease screening results from returning adults.

C Chemical Treatment

What chemicals and concentrations will be used for controlling fungus on eggs until the eyed stage?

Standard formalin drip/flush per ADF&G path lab recommendations, using 37% Formalin @ 750 ppm every other day. The frequency may be adjusted up or down to match site specific conditions. The efficacy of a salt water flush will be evaluated to determine if the technique could be used at this facility.

D. Enumerations

Describe the method(s) to be used in estimating numbers of green eggs, eyed eggs, and fry.

Standard volumetric enumeration will be used initially for green and eyed eggs. A Vaki nano fry counter will be used for counting fry. SSI has a goal to electronically count all life stages with an accuracy of > 98%. This electronic enumeration system will be developed, tested and implemented in Phase II.

E. Rearing Plans

Describe any plans to rear the salmon including type of food.

Rearing will be done in a combination of standard industry acceptable rearing systems. As the fish grow they will advance through circular or Swedish style start tanks, conventional raceways and / or silos for fresh water rearing, and eventually, saltwater net pens for advanced fingerlings and smolts. Some portion of advanced fingerlings may be test reared in silos with a pumped saltwater supply in lieu of rearing in saltwater net pens. Food will be one of a number of commercially available salmon foods like Ewos or similar. Food will be ordered in the appropriate sizes for the various sizes of fingerlings. Some feeding will be done by hand as necessary to monitor the health and response of the fish. At production levels, various automated feeding systems will be used for more efficient delivery and control of the food.

Phase I fish will be reared with a standard regimen, the specifics of which will not be determined until after the first brood year of eggs is in the incubators. At this time SSI will consult with ADF&G, LPW, NSRAA, SSERA, DIPAC and other private operators

to determine the best choice for target release size and release date based on the most recent adult return data available at that time. Since, SSI may have access to heated water, it hopes to experiment in Phase I with small lots of fish to determine what size zero check smolt can be produced with the geothermal heat source. Results from these tests will eventually lead to a rearing regimen that will be custom to the Baranof facility.

F. Disease Control

Describe plans for preventing or controlling disease during rearing.

Disease will be controlled by egg disinfectant; low stress rearing environment; clean, high quality rearing water; continual health monitoring and vaccination or use of medicated feed if needed. SSI will work closely with ADF&G Pathology Lab to develop a facility specific disease detection, monitoring, management and treatment program.

VII RELEASE PLAN

A. Release Site(s)

1. Give exact location and description of proposed release site(s), including maps.

Chinook and coho will be released from the rearing facilities in Warm Springs Bay. SSI may experiment with holding coho or Chinook overwinter in submerged net pens in Baranof Lake for a spring transfer by gravity pipeline to the Phase I facility for enumeration, tagging or other feeding or processing and on into saltwater rearing or direct saltwater release.

The facility will have central incubation capabilities. In the future, SSI or ADF&G may propose remote releases on special enhancement or rehabilitation projects. These will be subject to specific review and agency approval.

The exact rearing and release regimen for the Baranof production fish will be as detailed in item VI E above and with the best information available at the time in close consultation with ADF&G and advice from other operator's experiences. Some adjustments and accommodations to the rearing and release protocols will need to be made based on the actual size and maturity of the fish as they develop in the Baranof watershed temperature regimes. SSI will continually seek the optimum rearing and release strategy by working with and sharing information with other operators in the area. Some groups of fish may be held in saltwater rearing pens over winter, short term reared in saltwater pens in the spring or released directly into saltwater from the facility.

2. List proposed number and age of each species to be released at each site.

All fish will be released in Warm Springs Bay.

Phase I smolt release goal is: 1,800,000 pink, 9,000,000 chum, 1,600,000 coho and 429,000 Chinook

Phase II smolt release goal is : 18,000,000 pink, 72,000,000 chum, 20,000,000 coho and 1,600,000 Chinook

Phase III smolt release goal is: 90,000,000 pink, 90,000,000 chum, 20,000,000 coho and 10,000,000 Chinook

B. Transportation

Discuss the methods planned for transporting live fish from the hatchery to the release site(s).

The hatchery is the primary release site. Any future projects that may require transportation would use airplane, helicopter, boat or barge in aerated transport tanks or oxygenated bags.

VIII STAFFING

A. Technical Advisors

Attach information about each technical advisor to the nonprofit corporation, indicating that person's name, address, role and responsibilities, and a brief statement of technical qualifications.

Dale Young- Fish Biologist; Fish Culturist; Asst. Mgr. Montauk State Hatchery, MO; Contractor and Mgr. Hazelton Springs Hatchery, MO; ADF&G, FRED Div. Southeast Regional Hatchery Manager; General Contractor, Young Construction Co.; Hawken LLC, manager; 47 years experience.

Dale Young III- Financial Analyst, CFP, CPWA, UBS. 23 years experience.

Shane Young, P.E.- Civil Engineer, R.F. Stearns Engineering, OR; Structural Engineer, R&M Engineering, AK. , Structural Engineer, PND Engineering, AK, Structural Engineer, Ambrose Engineering, WS, 19 years experience.

Greg Young- Fish Biologist; Wildlife Biologist; Hatchery Manager, Little Grassy Hatchery/ Team Leader Jake Wolfe Hatchery, IL; ADF&G Fish Biologist; NSRAA Juneau Area Project Manager; Young Construction Co, AK; Hatchery Manager Cleghorn Springs Hatchery, SD; Tanimura Dakota Industries, Genaeral Manager Design and Engineering, SD; Rosebud Electronic Integration Corp., CEO, Industrial Process Manager, Industrial Designer, 43 years experience.

Alex Wertheimer- Retired NMFS Research Fish Biologist and Chinook salmon specialist. 43 years experience.

Steve Reifenstuhl- Operations Manager NSRAA-development of NSRAA program beginning in 1980. Development of hatcheries, lake rearing programs, spawning channels, streamside incubation, and remote release strategies, Silver Bay Seafoods, agent. 37 years experience.

B. Design and Construction

Attach a list of the names and qualifications of persons or corporations responsible for final design and construction of proposed facilities.

Dale Young see VIII A. above
Shane Young see VIII A. above
Greg Young see VIII A. above

C. Phase I Administrative Personnel

List the administrative personnel who will support this facility when operational.

	Personnel Assigned (Titles)	Percentage of Time
1.	SSI Manager	12 Months

D. Phase I Operating Personnel

List the operating personnel who will be assigned to this facility when operational.

	Personnel Assigned (Titles)	Percentage of Time
1.	Hatchery Manager	12 Months
2.	Assistant Hatchery Manager	12 Months
3.	Fish Culturist II	12 Months
4.	Fish Culturist I	12 Months
5.	Maintenance Technician	12 Months
6.	4 Field technicians as needed during spawning season (Seasonal)	6 Months
	Total: 5 Full-time, 4 Seasonal Employees	

IX FINANCIAL PLAN

An estimate of hatchery construction and operating costs should be detailed here. These estimates would provide an indication of the cost recovery requirements of the proposed facility on an annual basis. Acceptance of this application by the Department of Fish and Game in no way implies agreement by the Department of Commerce and Economic Development to commit state loan funds for this project.

The financial planning for this project is based on assumptions and data gathered from many sources including but not limited to ADF&G, ADCED, DIPAC, NSRAA, R&M Engineering, PND Engineers, Northwind Architects, Canyon Hydro, Hawken LLC, numerous suppliers and several general contractors. Since there is no final design at this point in the project, it is impossible to get a fixed contract price for the construction of the facility. For purposes of testing the financial viability of the project, SSI has used engineer construction cost estimates believed to be on the high end of anticipated actual costs. These costs have been spread out over time to approximate reasonable cash flow requirements for a phased construction project, and they have been arbitrarily set at $1 million dollars per year which is the maximum amount that can be loaned by the fisheries revolving loan fund without a special approval exceeding that limit. SSI will also seek other financing and grant funds to help on the front end and throughout the project. None of these funds have been secured at this time. Therefore, all financial pro formas contained in this application serve as "proof of concept" illustrations. The operating costs have been derived by using a simple cost per fish approach from data obtained primarily from DIPAC and Hidden Falls facilities. These operating costs have been adjusted for the expected advantages of economy of scale and energy efficiency potential at the proposed Baranof facility. The projected number and value of the cost recovery fish has been derived from data obtained from ADF&G, ADCED, DIPAC and NSRAA. SSI does not expect actual loans, grants and project costs will match the numbers contained in the planning proformas. However, by taking a worst case project cost scenario and testing it

with acceptable data and performance assumptions, SSI hopes to demonstrate the Baranof Salmon Facility is economically viable.

See attached Appendix L:

1. Phase I Facility Preliminary Construction Budget Estimate
2. Phase I Facility Preliminary Operating Budget Estimate
3. Baranof Phase I Cost Recovery Harvest Proforma
4. Baranof Salmon Facility Financial Analysis Proforma

X. Basic Management Plan

The preparation of a draft Basic Management Plan will be completed prior to the public hearing. The applicant will be expected to work closely with ADF&G staff in developing the Basic Management Plan (see 5 AAC 40.820).

For additional project history:

See attached Appendix M:

1. Historic ADF&G Baranof Project Analysis
2. Historic ADF&G Baranof Project Score
3. Historic ADF&G Baranof Project Management Considerations
4. Historic ADF&G Baranof Project Public Hearing

XI DECLARATION AND SIGNATURE

I declare that the information given in this application is, to my knowledge, true, correct, and complete.

Original submission	10/1/17
Amended	11/5/17

Dale Young	11/5/17
Name of Applicant	Date Signed
Dale Young	11/5/17
Signature of Applicant	Date