AGENDA

WETLANDS REVIEW BOARD
REGULAR MEETING

March 24, 2016
Marine View 4th Floor Large Conference Room
5:15 P.M.

I. ROLL CALL

II. APPROVAL OF MINUTES

March 3, 2016
(March 12 special meeting minutes are not available yet)

III. APPROVAL OF AGENDA

IV. PUBLIC PARTICIPATION ON NON-AGENDA ITEMS

V. BOARD COMMENTS

VI. AGENDA ITEMS

1) USE2016 0004 Hidden Valley (upper Lemon Creek) Gravel Extraction
   A. Staff Presentation
   B. Applicant Presentation
   C. Public Testimony
   D. Board/Staff Discussion
   E. Motion

2) Continuation of wetland methodology review on formulas and models

VII. PENDING PERMITS & UPDATES

1) Juneau Wetlands Management Plan Update

VIII. PLANNING COMMISSION LIAISON UPDATE

IX. SCHEDULE FOR NEXT BOARD MEETING

Thursday April 7, 5:15 pm; wetland methodology workshop Marine View 4th floor conference room

Thursday April 21, 5:15 pm; wetland methodology workshop and regular meeting, City Hall room 224

X. ADJOURNMENT

DRAFT MINUTES

WETLANDS REVIEW BOARD

March 3, 2016, 5:15 p.m. Marine View 4th Floor Conference Room

Meeting Summary

Roll Call

Board Members Present: Amy Sumner, Brenda Wright, Lisa Hoferkamp, Percy Frisby, Irene Gallion, Nina Horne, Andrew Campbell

Board Members Absent: Hal Geiger, Ben Haight

A quorum was present.

Staff Members Present: Teri Camery, Senior Planner; Jonathan Lange, Planner II

Public Present: Alan Steffert, CBJ Engineering; Richard Harris; Art Dunn

Meeting called to order at 5:20 p.m.

II. January 21, 2016 minutes approved as written

III. Agenda approved

IV. Public Participation on Non-Agenda Items**.**
None

V. Board Comments.
None

VI. <u>Agenda Items</u>

1) SMP 2016 0001 Major Subdivision Review

Ms. Gallion explained that she had a conflict of interest due to her firm's interest in the proposal, and recused herself from the discussion and the vote.

Staff presentation

Ms. Camery explained that the Board was reviewing this major subdivision in its advisory role, and that comments would be incorporated into the planner's staff report to the Planning Commission. Mr. Lange provided an overview of the subdivision proposal for 26 lots, and

explained that the proposal affects 1.6 acres of wetlands but no anadromous streams. He referred to a letter from the U.S. Fish and Wildlife Service regarding stormwater, and explained the applicant's stormwater proposal.

Applicant presentation

Mr. Harris said he would answer any questions from the Board.

Board/staff discussion

Ms. Wright and Mr. Campbell asked Mr. Harris questions regarding the routing of stormwater and the effect on anadromous waters in the Mendenhall State Game Refuge across the road. Mr. Campbell said that a final stormwater management plan would be required from the CBJ at the final plat stage; the current plat review was for the preliminary plat when full details are not yet required.

Dr. Hoferkamp proposed the following motion:

> *The Wetlands Review Board supports the project with the understanding that the CBJ Stormwater Manual of Best Management Practices will be strictly adhered to and appropriately enforced.*

The Board approved the motion unanimously.

2) CSP2016 0002 City Project Review for West Douglas Pioneer Road

Staff presentation

Ms. Camery said that she had strong personal views on the project and needed to recuse herself from the discussion for this reason. She said she would respond only to questions regarding the Board's role. She said that the board was again reviewing the project in its advisory role, and that Board comments and motions would be included in planner's staff report to the Planning Commission.

Ms. Gallion explained that she had a conflict of interest due to her firm's interest in the proposal, and recused herself from the discussion and the vote.

Mr. Lange provided an overview of the project, a 2 ¼ mile long single lane road equivalent to a driveway, which would not be platted as a city street at this time. He explained that the area is designated as a New Growth Area in the Comprehensive Plan. He said that the road corridor goes only through CBJ property; Goldbelt property is located along the coast. He said the project impacts 1.65 acres of wetlands, and referred to the Corps Permit in the packet. He also referred to comments from the U.S. Fish and Wildlife Service that address habitat impacts, specifically sediment impacts on downstream fish habitat and high quality deer habitat.

Ms. Wright expressed concerns that ADFG did not conduct their field work at the time of year when cutthroat trout would be found in the drainages there, therefore this resource was omitted from their studies. Board members asked the applicant questions regarding the final alignment and the alternatives considered. Mr. Steffert reviewed the three alternatives that were considered and explained the process of comparing impacts between them. He explained that CBJ chose the upper alignment to stay within CBJ Land and to stay out of the fish zone. He said he had walked the route with the U.S. Fish and Wildlife Service and integrated their concerns into the design. He explained that Goldbelt Inc. supports the project for access to their property from city land, however Goldbelt is opposed to a road on their land.

Ms. Wright asked who would use the road, and Mr. Steffert explained that it's a policy decision that is up to the Assembly. Mr. Campbell inquired about whether the proposal would be the final right-of-way location, and Mr. Steffert said yes.

Ms. Horne asked about the public process. Mr. Steffert explained that the CBJ Assembly appropriated the funds for the development through a public process. Mr. Lange explained the CSP review process.

Mr. Campbell and Dr. Hoferkamp asked about ADFG permits, which Mr. Steffert reviewed with the Board.

Mr. Campbell said it was unfortunate that pristine habitat would be violated but he felt that options had been well-explored and he didn't see a better alternative. He suggested a recommendation to approve the project with Best Management Practices to ensure that the development is conducted in the least obtrusive fashion.

Ms. Wright proposed the following motion:

> *The Wetlands Review Board does not approve the building of this road. If the road is constructed, Best Management Practices and proper hydrological practices must be strictly adhered to*

Dr. Hoferkamp seconded the motion.

Mr. Campbell said he could support the second half of the motion, but not the first half.

Roll Call vote:

Yes: Horne, Wright, Hoferkamp
No: Campbell, Frisby
Abstained: Sumner

Motion failed.

Ms. Hoferkamp proposed a new motion:

> *The Wetlands Review Board recommends that if the project is pursued that Best Management Practices be strongly adhered to with the goal of maintaining water quality and fish passage.*

Ms. Wright second the motion:

Roll call vote:
Yes: Campbell, Frisby, Sumner, Hoferkamp
No: Wright
Abstained: Horne

Motion failed.

Ms. Wright said she is still opposed to the project. Mr. Steffert said that the Board's comments would be carefully noted.

3) Juneau Wetlands Management Plan Update

Ms. Camery said that she has received the second draft of the JWMP, which is undergoing internal review and comment. She said that the final draft of the JWMP from the consultants would be presented to the Board, Habitat Mapping Working Group, Planning Commission, and Assembly Lands Committee in a final series of meetings in April and May before the grant and contract expire on June 1. She said that the latest draft follows the board's guidance for a plan that can be adopted as is, to promote use of the information, with goals and policies that will lead to development of wetland categories in the future.

VII. Pending Permits and Updates

1) Lemon Creek Gravel Extraction

Ms. Camery said that CDD has received an application for mining in the Lemon Creek streambed farther upstream in Hidden Valley. This application will come to the board for their advisory review at the March 24 regular meeting.

2) Wetlands Review Board Wetland Methodology Workshops

Ms. Camery referred to the board meeting list and reviewed the agenda for the upcoming workshop, Saturday March 12, 8:30-5:30 in the Assembly Chambers.

3) Southeast Alaska Fish Habitat Partnership wetland methodology peer review

Ms. Camery explained that SEAKFHP would be undertaking a technical peer review of the WESPAK-SE wetland methodology, with the goal of establishing "confidence intervals" for various functions and values assessed by the methodology. She said that SEAKFTP partners might be attending the Wetlands Review Board workshop to gain a better general understanding of the methodology. She said that Debbie Hart, SEAKFHP Coordinator, would be also be facilitating the Wetlands Review Board wetland methodology workshops.

VIII. Planning Commission Liaison Update.

No update was given.

IX. Next meeting: Wetland Methodology Workshop, Saturday March 12, 8:30-5:30 pm Assembly Chambers

The meeting was adjourned at approximately 7:20 p.m.

Community Development

City & Borough of Juneau • Community Development
155 S. Seward Street • Juneau, AK 99801
(907) 586-0715 Phone • (907) 586-4529 Fax

DATE: March 15, 2016

TO: Wetlands Review Board

FROM: Tim Felstead, Planner
Community Development Department

PROPOSAL: A Conditional Use Permit to extract extract/mine gravel from patent lands in Hidden Valley, Lemon Creek.

APPLICANT: SECON Inc.

ADDRESS: Hidden Valley, Lemon Creek

PROJECT DESCRIPTION

The applicant is requesting a Conditional Use Permit for the extraction of sand and gravel in stream bed of Lemon Creek in the Hidden Valley area. The extraction would be located in three areas within gravel bars at the edge of the current Lemon Creek Stream bed.

BACKGROUND

SECON Inc. is seeking to establish new gravel extraction areas further upstream in the Lemon Creek stream bed than is currently permitted under USE2012 0019 and USE 2003 00045 in the Lemon Creek. (See Project Narrative, Attachment A).

The extraction will provide sands and gravels for local construction projects.

The proposed site locations are a relatively far away from the nearest use although there is an explosives store along the potential access route to the severance site furthest upstream. If this route is used then adequate protection should be provided to prevent vehicle and equipment collisions with these storage containers.

The extraction will occur in three severance areas which will be approved by the Alaska Department of Fish and Game (ADFG). All severance areas have a 30ft buffer between the extraction areas and the existing stream channel. The severance areas will be staked by ADFG biologists. Berms will be created across dry channels to provide additional protection to the severance zones from any flooding.

SECON is proposing to start at the downstream severance zone and move upstream to the additional severance zones in sequence.

Amounts of possible gravel to be extracted is based on an assumed depth of 15ft and estimates of the size of the potential severance zone once buffers have been taken into account. No samples cores have been taken to fully understand the depth of gravels in the three severance zones.

The downstream location is the easiest to access due to its proximity to existing SECON road. Construction plans (see Attachment 2 of Attachment A) indicate a volume of up to 149, 243 cubic yards could be extracted from this location.

The second severance zone would require the creek to be bridged. SECON has proposed two bridging options:

1. a temporary bridge (if operation period in order of days) which would require construction of banks to support the structure.
2. a seasonal bridge (remaining for the whole mining season) which would require a more substantial bank to be created with possible need for bank armoring.

It is noted that the bridge should be able to be removed in the event that waters rise quickly. The applicant will have to explain how the bridge would be removed for both options. SECON's preferred location for this bridge is based on where an existing rip-rap bank exists on the western side of the creek. Plans indicate up to 120,057 cubic yards could be extracted from this location.

A third severance zone would be further upstream and two alternatives are proposed to access this area. The first option would see a second bridge placed across the creek with vehicles and machinery accessing via Severance zone 2 and up the eastern side of the creek. The second option would see the old logging road used with a small stream either being bridged or culverted. There is a shared access easement along this road with surrounding property owners. Up to 33,777 cubic yards could be removed from this location.

Additional fill to construct an access road to the three severance sites has been permitted by the Army Corp of Engineers (see Attachment 4 of Attachment A).

A gravel wash station will be used to remove small vegetative material from the extracted sand and gravel. SECON has not yet obtained a water use permit from DNR for this operation. They do have a pond on their site which could potentially be used without a DNR permit.

It is expected sediment from vehicles hauling from the site will have shed by the time it reaches the public road system. Use of a vehicle wash could be required if sediment began to appear on the public road system. Vehicles moving back onto the existing quarry road will pass through a wash station on SECON property and again as they enter the public road system. Vehicle fueling will take place above OMHW.

Vegetation in the severance zones is mainly alders. These would be cleared in the gravel extraction areas and where necessary to construct access roads. Cleared vegetation is to be left on site following completion of the works as per the State Fish and Game permit.

At the time of writing, the Alaska Department of Environmental Conservation (ADEC) requested the applicant inform them of any high turbidity events. It also noted that Lemon Creek is listed as an impaired water body due to sediment loading and turbidity. Lemon Creek is one of five impaired waterbodies within the borough. SECON monitor turbidly at the Anka St site by taking a sample of water above and below the extraction site – the same method would be employed at this new location.

Following the end of the extraction season the berms will be removed from the flood plains allowing the severance voids to be filled with sediment during high water events. SECON has suggested that sediment captured by these voids will be beneficial to slow current erosion occurring in the Lemon Creek floodplain of Hidden Valley.

Where channels are not filled and become useful habitat for anadromous fish it is expected ADFG will remove the new pond from future extraction activities.

SECON also list other benefits that may occur:

- Stabilize stream channel
- Vegetation can reclaim the stream banks
- Much slower erosion of banks
- Habitat for indigenous fish
- Prevent eroded sands and gravels from transporting to the lower Lemon Creek reaches, which reduces flood potential downstream
- With less active erosion, the turbidity may be less during high water events.

Habitat- The length of Lemon Creek in the project area is catalogued as an anadromous stream supporting Chum and Coho salmon, and Dolly Varden Char (see Attachment B). Development along the creek is subject to habitat buffers in CBJ Title 49.70.310(a) (4) and (b) (1), as well as at CBJ 49.70.950(f). Gravel extraction is exempt from the 50ft setback requirement normally associated with anadromous streams.

49.70.950(f) exempts gravel extraction from the 50ft setback requirement normally associated with anadromous streams.

> *49.70.950 (f) All structures and foundations located adjacent to streams or lakes listed in Table VI-2 of Appendix C of the Juneau Coastal Management Plan, shall have a 50-feet setback from each side of the stream or lake measured from the ordinary high water mark, where feasible and prudent; provided, docks, bridges, culverts and public structures whose purpose is access to or across the stream or lake are not subject to this policy, and provided further,* ***uses which must be in or adjacent to the stream or lake in order to function, such as mining activities, fish culturing, water supply intakes and similar uses, are exempt from the setback requirement.*** *The setback shall be vegetated or revegetated, where feasible and prudent, and such vegetation or revegetation shall be kept or arranged to maximize shade on the stream.*

SECON proposes to build up to two temporary bridges which could potentially remain in place for the entire mining season. State Fish and Game have approved the use of bridges to cross creek with specific design requirements to be met. The location of these bridges could shift over the lifetime of the operation to respect newly formed habitat ponds and channels with relatively still water. ADFG would take the lead on determining when and how bridges should be located during the yearly mining plan review.

Wetlands – Based on the WESPAK wetlands mapping layer a small area of wetlands appears to exist in the lot but is outside of the proposed severance zones.

Additional fill to construct an access roads to the three severance sites has been permitted by the

Army Corp of Engineers (see Attachment 4 of Attachment A).

RECOMMENDATION

The Wetlands Review Board is to review the subject application and proposed project in their scientific advisory role, and to make comments and a motion that will be included in a staff report to the Planning Commission.

Any approval of a CBJ permit should attempt to provide for 49.70.950 (c)(7):

> *49.70.950 (c)(7): Rivers, streams and lakes shall be managed so as to protect natural vegetation, water quality, important fish or wildlife habitat and natural waterflow.*

In additional to the general review and comments, Staff would appreciate guidance from the WRB on the following aspects of the proposal:

i) The season to extract gravel. The application indicates a season that runs from March to November. Greg Albrecht (ADFG) indicated that if conditions allowed, he would like to see more mining during the winter months. Staff suggests a year round permit to facilitate this.

ii) Should any severance area be mined preferentially over others? It is clear the preference is to work the downstream site first and then work upstream.

iii) The methods to access the 2nd and 3rd severance areas are listed as options. Is there a preferred method of access? The ADFG permit specifically describes how the bridge abutments should be constructed of log and gravel with flatcars providing the crossing. In recognition of the dynamic nature of the Lemon Creek floodplain, Staff suggests allowing retain flexibility in crossing locations and design. This would be agreed at an annual review of the mining plan in consultation with relevant agencies, in particular ADFG.

iv) If there should be a time limit after which the permit needs to be renewed. It is expected conditions imposed by CBJ and other agencies allows for the permit to be cancelled should significant violations occur. Given there will be an annual review of the mining plan for the forthcoming year a permit period of 10 years is suggested

At this stage of the review process permit conditions for the extraction will heavily draw on those provided in the Notice of Decision for USE2012 0019 (See Attachment C). Some conditions have been removed where they were considered irrelevant to the site.

ATTACHMENTS

A – Conditional Use Permit Review Application and Narrative
B – Memorandum from AK Department of Fish and Game
C – Notice of Decision for USE2012 0019.

DEVELOPMENT PERMIT APPLICATION

Project Number	CITY and BOROUGH of JUNEAU	Date Received: 2/16/16
Project Name (City Staff to Assign Name)		

PROJECT / APPLICANT INFORMATION

Project Description
Extract gravels from patent lands in Hidden Valley

PROPERTY LOCATION

Street Address	City/Zip
end of road Anka Drive	Juneau 99801

Legal Description(s) of Parcel(s) (Subdivision, Survey, Block, Tract, Lot)
Tract A, U.S. Survey 5504, M.S.526

Assessor's Parcel Number(s)
3M000LEMCRK2

LANDOWNER/ LESSEE

Property Owner's Name	Contact Person:	Work Phone:
Secon Inc.	Tim Dudley	780-5145
Mailing Address	**Home Phone:**	**Fax Number:**
P.O. Box 32159, Juneau AK 99803		
E-mail Address	**Other Contact Phone Number(s):**	

LANDOWNER/ LESSEE CONSENT ****Required for Planning Permits; not needed on Building/ Engineering Permits****

I am (we are) the owner(s)or lessee(s) of the property subject to this application and I (we) consent as follows:

A. This application for a land use or activity review for development on my (our) property is made with my complete understanding and permission.
B. I (we) grant permission for officials and employees of the City and Borough of Juneau to inspect my property as needed for purposes of this application.

X _____ Landowner/Lessee Signature — Date: 2/16/16

X _____ Landowner/Lessee Signature — Date

NOTICE: The City and Borough of Juneau staff may need access to the subject property during regular business hours and will attempt to contact the landowner in addition to the formal consent given above. Further, members of the Planning Commission may visit the property before the scheduled public hearing date.

APPLICANT If the same as OWNER, write "SAME" and sign and date at X below

Applicant's Name	Contact Person:	Work Phone:
Secon Inc.	Michael Short	780-5145
Mailing Address	**Home Phone:**	**Fax Number:**
P.O. Box 32159, Juneau AK 99803		
E-mail Address	**Other Contact Phone Number(s):**	
MShort@colaska.com		

X _____ Applicant's Signature — Date of Application: 2/16/16

STAFF APPROVALS

----------OFFICE USE ONLY BELOW THIS LINE----------

✓	Permit Type	***SIGN	Date Received	Application Number(s)
	Building/Grading Permit	■		
	City/State Project Review and City Land Action	■		
	Inquiry Case (Fee In Lieu, Letter of ZC, Use Not Listed)	■		
	Mining Case (Small, Large, Rural, Extraction, Exploration)			
	Sign Approval (If more than one, fill in all applicable permit #'s)	■		
	Subdivision (Minor, Major, PUD, St. Vacation, St. Name Change)			
X	Use Approval (Allowable, Conditional, Cottage Housing, Mobile Home Parks, Accessory Apartment)		2/16/16	USE 2016 0004
	Variance Case (De Minimis and all other Variance case types)	■		
	Wetlands Permits			
	Zone Change Application			
	Other (Describe) _____			

***Public Notice Sign Form filled out and in the file.

Comments _____ Initials

Attachment A - Application and Narrative (including ADFG permit and ACOE permit)

NOTE: DEVELOPME ... ATIONS

ALLOWABLE/CONDITIONAL USE PERMIT APPLICATION

Project Number	Project Name (15 characters)	Case Number	Date Received
		USE20160004	2/16/16

TO BE COMPLETED BY THE APPLICANT

TYPE OF ALLOWABLE OR CONDITIONAL USE PERMIT REQUESTED

☐ Accessory Apartment*** (AAP) ☐ Driveway in Right-of-Way (ADW)

☒ Use Listed in §49.25.300 (Table of Permissible Uses) (USE)

Please list the Table of Permissible Uses Category: 14.500

***An Accessory Apartment Application will also be required.

DESCRIBE THE PROJECT FOR WHICH AN ALLOWABLE OR CONDITIONAL USE APPROVAL IS NEEDED.

Extract/mine gravels form patent lands in Hidden Valley.

IS THIS A MODIFICATION OF AN EXISTING APPROVAL?

☒ NO ☐ YES – Case # _____

CURRENT USE OF LAND OR BUILDING(S):

None

PROPOSED USE OF LAND OR BUILDING(S):

Gravel Extraction

UTILITIES PROPOSED:

WATER: ☐ Public ☐ On Site SEWER: ☐ Public ☐ On Site

SITE AND BUILDING SPECIFICS:

Total Area of Lot 492,228 square feet

Total Area of Existing Structure(s) 0 square feet

Total Area of Proposed Structure(s) 0 square feet

EXTERNAL LIGHTING:

Existing to remain ☐ No ☐ Yes – Provide fixture information, cutoff sheets, and location of lighting fixtures

Proposed ☒ No ☐ Yes – Provide fixture information, cutoff sheets, and location of lighting fixtures

PROJECT NARRATIVE AND SUBMITTAL CHECKLIST:

☒ Site Plan

☐ Floor Plan of proposed buildings

☐ Elevation view of existing and proposed buildings

☐ Proposed Vegetative Cover

☐ Existing and proposed parking areas (including dimensions) and proposed traffic circulation

☒ Existing Physical Features of the site (drainage, habitat, hazard areas, etc.)

For more information regarding the permitting process and the submittals required for a complete application, please see the reverse side.

If you need any assistance filling out this form, please contact the Permit Center at 586-0770.

ALLOWABLE/CONDITIONAL USE FEES

	Fees	Check No.	Receipt	Date
Application Fees	$1600.00		CD07625	2/16/16
Admin. of Guarantee	$			
Adjustment	$			
Pub. Not. Sign Fee	$			
Pub. Not. Sign Deposit	$			
Total Fee	$			

NOTE: MUST BE ACCOMPANIED BY DEVELOPMENT PERMIT APPLICATION FORM

Allowable/Conditional Use Permit Application Instructions

Pre-Application Conference: A pre-application conference is required prior to submitting an application. The applicant will meet with City & Borough of Juneau and Agency staff to discuss the proposed development, the permit procedure and to determine the application fees. To schedule a pre-application conference, please contact the Permit Center at 586-0770 or via e-mail at permits@juneau.org.

Application: An application for an Allowable/Conditional Use Permit will not be accepted by the Community Development Department until it is determined to be complete. The items needed for a complete application are:

Forms: A completed Allowable/Conditional Use Permit Application and Development Permit Application form. The "land owner or lessee consent" signature is mandatory for all landowners on the Development Permit Application form.

Fees: The fee is dependent upon the class of the proposed use. Land Use fees generally range from $350 to $1,600. Any development, work or use done without a permit issued will be subject to double fees. All fees are subject to change.

Project Description: A detailed letter or narrative describing the project.

Plans: All plans are to be drawn to scale and clearly show the items listed below:

A. Site plan, floor plan and elevation views of existing and proposed structures
B. Existing and proposed parking areas, including dimensions of the spaces, aisle width and driveway entrances
C. Proposed traffic circulation within the site including access/egress points and traffic control devices
D. Existing and proposed lighting (including cut sheets for each type of lighting)
E. Existing and proposed vegetation with location, area, height and type of plantings
F. Existing physical features of the site (i.e. drainage, eagle trees, hazard areas, salmon streams, wetlands, etc.)

Document Format: All information that is submitted as part of an application shall be submitted in either of the following formats:

A. Electronic copies may be submitted by CD, DVD or E-mail in the following formats: .doc, .txt, .xls, .bmp, .pdf, .jpg, .gif .xlm, .rtf or other formats pre-approved by the Community Development Department.
B. Paper copies may not be larger than 11" X 17" (Unless a larger paper size is preapproved by the Community Development Department).

Application Review & Hearing Procedure: Once the application is determined to be complete, the Community Development Department will initiate the review and scheduling of the application. This process includes:

Review: As part of the review process the Community Development Department will evaluate the application for consistency with all applicable City & Borough of Juneau codes and adopted plans. Depending on unique characteristics of the permit request the application may be required to be reviewed by other municipal boards and committees. During this review period, the Community Development Department also sends all applications out for a 15-day agency review period. Review comments may require the applicant to provide additional information, clarification, or submit modifications/alterations for the proposed project.

Hearing: All Allowable/Conditional Use Permit Applications must be reviewed by the Planning Commission. Once an application has been deemed complete and has been reviewed by all applicable parties the Community Development Department will schedule the requested permit for the next appropriate meeting.

Public Notice Responsibilities: As part of the Allowable/Conditional Use permitting process, all permit requests must be given proper public notice, which consists of the following:

Community Development Department: Will give notice of the pending Planning Commission meeting and its agenda in the local newspaper a minimum of 10-days prior to the meeting. Furthermore, the department will mail abutters notices to all property owners within 500-feet of the project site.

Applicant: Will post a sign on the site at least 14-days prior to the meeting. The sign shall be visible from a public right-of-way or where determined to be appropriate by the Department. Signs may be produced by the Community Development Department for a preparation fee of $50, and a $100 deposit that will be refunded in full if the sign is returned by 4:30 p.m. on the Monday following the scheduled hearing date. If the sign is returned later than the Monday after the Planning Commission meeting, but within two weeks of the meeting, $50.00 may be refunded. The applicant may make and erect their own sign. Please speak with the Community Development Department for more information.

INCOMPLETE APPLICATIONS WILL NOT BE ACCEPTED

SECON

SOUTHEAST ALASKA

Hidden Valley Gravel Extraction

CBJ Conditional Use Application

Michael Short

2/5/2016

Proposal to extract gravels from Lemon Creek in Hidden Valley

SECON
SOUTHEAST ALASKA

Hidden Valley Gravel Extraction

Proposal

SECON is proposing to extract gravel from property owned in Hidden Valley, Hidden Valley Subdivision within Tract A, M.S. 526 which is 113.29 acres in size. This tract of land is located on the floor of the valley spanning its width and several thousands of feet in length.

Secon is requesting a USE Permit for this gravel severance for an interval of 10 years.

Hours of operation would be from 7:00 AM to 7:00 PM. With the season of operations being from March to November.

There is no way of knowing the quantity of gravels that will be severed from this site on an annual basis. The existing permitted operation in the Lower Lemon Creek streambed[1], has produced roughly 10,000 cubic yards per year. As the markets adjust to the supply of local gravels, the sales and interest in their use has increased. If the area is available as determined by AKDF&G and sales will support the volume, Secon could easily extract 50,000 Cubic Yards of material on an annual basis.

SECON would use excavators, scrapers, loaders and dozers to sever the sands and gravels from the alluvial reaches in Hidden Valley. The severed materials would be loaded into conveyance units of either end dumps or articulated trucks for transportation to a processing area out of the flood plain of Lemon Creek.

Goals to be achieved in gravel extraction.

1. Slow down the high rate of erosion throughout the Hidden Valley area.
    a. In 2010 Lemon Creek eroded several new areas including developed Secon property.
    b. Secon has previously requested permission to deposit Rip Rap on the stream banks to stop erosion of property.
2. Extract sand and gravel for local private and public improvements.

Benefits that may be achieved.

1. Stable stream channel.

[1] Lemon Creek Gravel Extraction is an active gravel extraction operation in Lemon Creek, which has been in operation since 2009. It is located between the Glacier Highway Bridge over Lemon Creek and State of Alaska Lemon Creek Correctional Center on patented private property spanning Lemon Creek. It is permitted by the following agencies:

- City and Borough of Juneau; PERMIT USE 2012 0019
- Department of the Army U.S. Army Engineer District, Alaska; PERMIT POA-1983-20-M4
- State of Alaska Department of Environmental Conservation; 401 Certificate of Reasonable Assurance
- State of Alaska Department of Fish and Game; Fish Habitat Permit FH14-I-0104

2. Vegetation can reclaim the stream banks.
3. Much slower erosion of banks.
4. Habitat for indigenous fish.
5. Attempt to keep eroded sands and gravels from transporting to the lower Lemon Creek reaches, which reduces flood potential.
6. With less active erosion, the turbidity may be less during high water events.

GEOLOGY

Alaska has formed over the millennia from the moving of tectonic plates. Southeast Alaska is the result of the North America plate scrapping up marine sediments and the collision with several tectonostratigraphic terranes. Tectonostratigraphic terranes are small landmasses of earth's crust material. Juneau sits upon the Taku Terrane with the Yukon-Tanana Terrane eastward and Gravina Belt westward. The Taku Terrane is made of sedimentary and volcanic rocks from the Permian-Cretaceous period. The Yukon-Tanana terrane is sedimentary rocks from the Devonian-Permian period. The Gravina Belt is sedimentary and volcanic rocks from the Jurassic-Cretaceous period. To the east of all three of these formations is the Coast Plutonic Complex made up of Cretaceous-Tertiary tonalite, Cretaceous-Tertiary plutonic rocks and gneiss rocks of an unknown age. To the west of the Gravina Belt is the Alexander Terrane[2].

Ice sheets from Pleistocene time period, in its last advance called the Wisconsin Glaciation, reached their maximum 25,000 years ago. The ices begin retreating from Southeast Alaska and Northern British Columbia about 16,000 years ago. The fjords around Juneau became ice-free about 13,000 years ago. Southeast Alaska has been rebounding from being ice-free. The rebound, along with the mountain building of the North America tectonic plate's subduction of the Pacific Plate, has changed where the tidal zone interacts with the continent. Since the retreat of the ice sheets the ocean level has changed where it has interacted with land in relation to current day Juneau. 13,000 years ago when the ice sheets retreated out of the fjords, the beaches around Juneau were 750 feet higher than they currently are[3]. In other words 13,000 years ago the beach was halfway up to the tram sitting on top of Mt Roberts. This gives an understanding of why there is gravel from the mountain valleys washing out to sea.

With the glacier melt and rains of Southeast Alaska, the gravels are in a relentless progression of being eroded and transported to lower elevations. The stream's bedload[4] of gravel is deposited upon reaching valley floors with gentle slopes or the tidelands where the velocity is reduced to a minimal flow. Aggradation of the valley floors and tide zones with alluvium has been going on since the environment has changed from an ice age to a temperate rain forest.

[2] Roadside Geology of Alaska, Cathy Connor

[3] Geology of Southeast Alaska: With Special Emphasis on the Last 30,000 Years, Cathy L. Connor, University of Alaska, Juneau, AK

[4] Bedload: Geology. the sand, gravel, boulders, or other debris transported by rolling or sliding along the bottom of a stream.

Hidden Valley is filled with deposited gravels from either glaciation and/or erosion. Erosion simply means the movement of rocks, gravels, sands and soils by natural forces.

Lemon Creek exhibits the Rosgen Type C Stream classification[5]. Lemon Creek has a well-developed floodplain and is slightly entrenched with a slope of less then 2%. The bed-form is of the riffle-pool type and sinuosity of more than 1.2. Point bars are also developed in its channels. It has aggradation/degradation of cobbles/gravel where Lemon Creek enters Secon's property on the north side transitioning to gravel/sand in the lower part of the valley before it enters the gorge. Lemon Creek can also exhibit Type D Stream characteristics in that it will become a braided channel. This is generally in elevated flows. It will have many bar types and un-vegetative island with local bed scour and deposits.

Hidden Valley has features of several Rosgen valley types. Lemon Creek has alluvial fans from minor streams cascading down Thunder Mountain into the Northwest side of the basin. These alluvial fans are indicative of Type III valleys. Lemon Creek also fits the Type V moderately steep valley that is a U-shaped glacial trough valley. The valley floor is sloped less the 4%. It also fit the criteria of deep coarse deposition of glacial till. Type VIII and IX are also descriptive of Hidden Valley. Type VIII is a river of multiple terraces positioned laterally along the valley. Alluvial terraces and floodplains are the principal landforms which produce the large sediment supply. Valley Type IX has glacial outwash plains where soils are derived from glacial, alluvial, and/or eolian deposits.

Habitat

As the ice retreated from the last ice advance 20,000 years ago the bare ground and rock faces were able to support fauna. The re-vegetation of the ice-free landscape covered both gravel valleys and the rock mountainsides. The hardy pioneer species such as lichens and mosses found habitat in the ice-free landscape. As the ice retreated further, the pioneer species were replaced with new ecosystems. Over the eons, this has re-established the coastal ecosystems to the temperate rain forest of the pacific coast. Today's dominant flora in the valleys of Southeast Alaska are the Western Hemlock and Sitka Spruce forests.

The riparian vegetation in Hidden Valley is in continual fluctuation. The seasonal floodwaters along with the scouring and deposition of the glacial debris in there lateral movement has limited the vegetative size and range of cover in the valley. The diversity of fauna in the riparian zone is limited to alders and other small plants that can grow in sandy soils. These plants readily re-establish in newly disturbed areas and are quick in growth. The larger evergreens are reserved to the slopes of the valley, only encroaching through the riparian zone to the streamside when the channel has been stable for long periods.

The fauna present in Hidden Valley is representative of Southeast Alaska. There are black bear, occasional deer and reports of wolf sightings. The Department of Fish and Game have trapped

[5] Environmental Protection Agency (EPA), Fundamentals of Rosgen Stream Classification System.

juvenile Dolly Varden and juvenile Coho Salmon in various side channels of Lemon Creek in Hidden Valley[6].

HIDDEN VALLEY

Hidden Valley is located about five miles North Northwest of Juneau Alaska and has a drainage basin area of approximately 15,730 acres. Lemon Creek's headwaters originate from two glaciers, Ptarmigan Glacier and Lemon Creek Glacier. Lemon Creek is roughly 8 miles in length and terminates 4.6 miles Northwest of Juneau into Gastineau Channel.

The terminus of Lemon Creek Glacier has an elevation of about 2,200 feet[7]. There are a series of falls from the glacier within the first mile dropping Lemon Creek to the valley floor at an elevation of 1,360 feet. To reach Gastineau Channel 7 miles away, Lemon Creek has an average slope of 3.68%. Which means that for every one hundred feet in distance-traveled Lemon Creek must lose 3.68 feet in elevation. For comparison, Lemon Creek from Glacier Highway bridge to Gastineau Channel has an average slope of 0.54%.

The glaciated alluvial gravels in Hidden Valley are continuing the natural erosion process that has been going on since the last ice age. The banks and streambed are continuing to erode during high water events. The eroded alluvial material is carried downward until the stream's velocity slows and can no longer transport the sediment load where it is then deposited. This area of deposition is lower Lemon Creek were the elevation drop of the stream lessens and the velocity of the water slows.

SECON has already lost several acres of real estate in Hidden Valley from Lemon Creek changing its channel during high water flows. The channel has changed yearly and is aggressively eroding the banks on both sides of the valley.

With lower Lemon Creek hemmed in with developed properties, the creek has only one restricted area to deposit its sediment load, in the confines of stream's armored banks. Once the streambed has filled in to the top of its armored banks it will return to a meandering braided stream, depositing at will in creating an alluvial fan of sedimentary sand and gravels.

The rate of erosion overall is not slowed in Lemon Creek. The volume of water flowing in Lemon Creek is a product of the rainfall, seasonal snowmelt and glacier melt. The velocity of Lemon Creek is the result of elevation change to reach Gastineau Channel. The composition of the sands and gravels are the results of continental building, namely erosion and glaciation. These sands and gravels will continue to erode and be transported to Gastineau.

[6] Memorandum, Lemon Creek Investigation, Ben Brewster Habitat Biologist I, May 14, 2013
[7] Google Earth 2005.

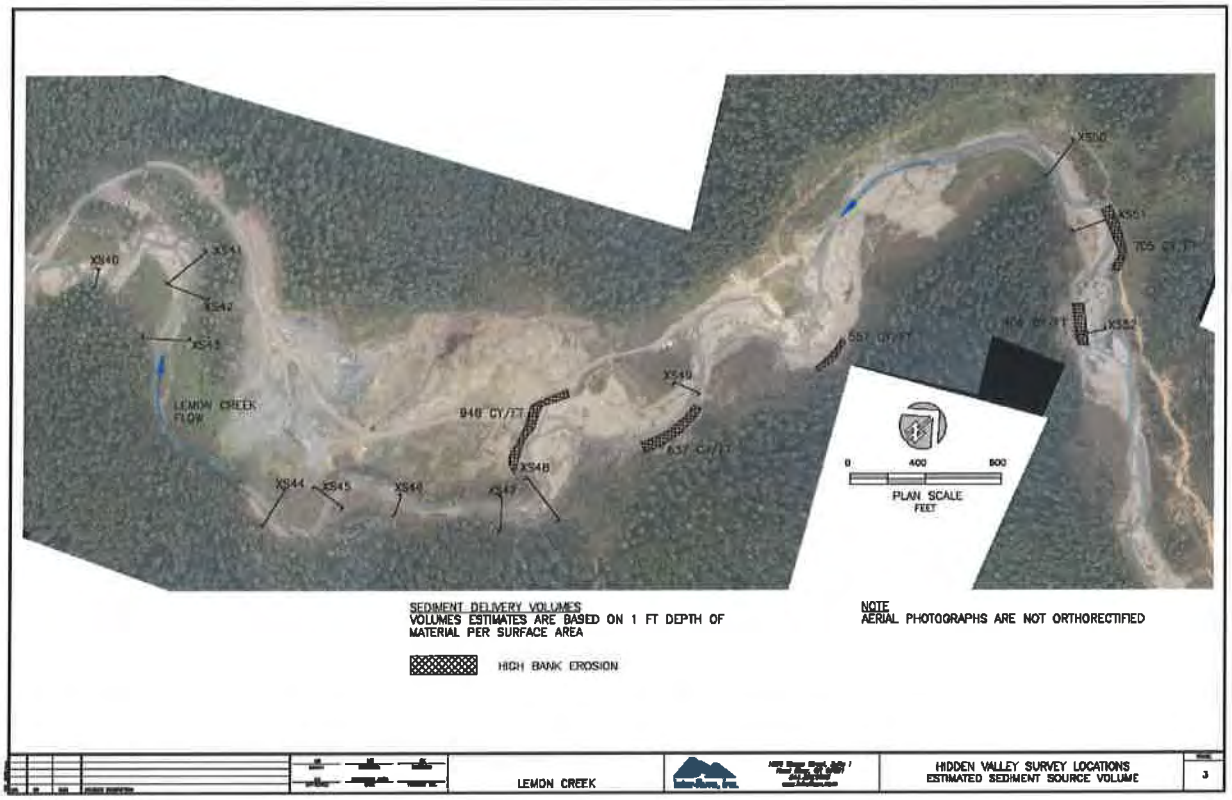


Image 1 - Inter-Fluve, Inc. Lemon Creek Watershed Geomorphic Assessment and Sediment Management Alternatives Analysis Figure 3

Some of the areas identified, on page 15, in CBJ's Lemon Creek Watershed Geomorphic Assessment and Sediment Management Alternatives Analysis Figure 3[8] can be managed through extraction.

This basin has glacier and continental eroded gravel deposits throughout the valley. However, the Lemon Creek's bed load of alluvial gravels can be reduced below the extraction sites. The gravels can be captured in the severed voids from the gravel extraction thus removing the gravels from being carried farther downstream to be deposited in the lower reaches of Lemon Creek. As can be documented in the Lemon Creek Gravel Extraction the eroded alluvial gravels that are carried by Lemon Creek are deposited in the voids created from the severed gravels. The creek flows to the point of least resistance during flooding. When the velocity slows, due to the volume change from the increased depth of severed void, the bed load sediments are deposited. Once the void is filled the creek will return to a braided channel state. Gravel reaches will form in a braided channel where the velocity slows at the edges of the stream on the inside of curves.

[8] City and Borough of Juneau's Lemon Creek Watershed Geomorphic Assessment and Sediment Management Alternatives Analysis, Prepared by: Inter-Fluve Inc., November 29, 2004

When Lemon Creek fills in the severed voids not all the area is equally filled. There are minor areas that are not returned to the elevation prior to the extraction. These areas at times can form either a minor stream or an eddy. If the minor streams are a stable environment, over time they can become viable habitat for fish. AKDF&G, through their issued Habitat Permit, will set back the gravel severance from that area in the form of a buffer zone. Thus, it becomes part of the ecological habitat of Lemon Creek.

Ownership and Legal Description

The property where the severance will occur is owned by COLASKA Inc. dba SECON and is described as Hidden Valley Subdivision within Tract A, M.S. 526, FR. U.S. Survey 5504.

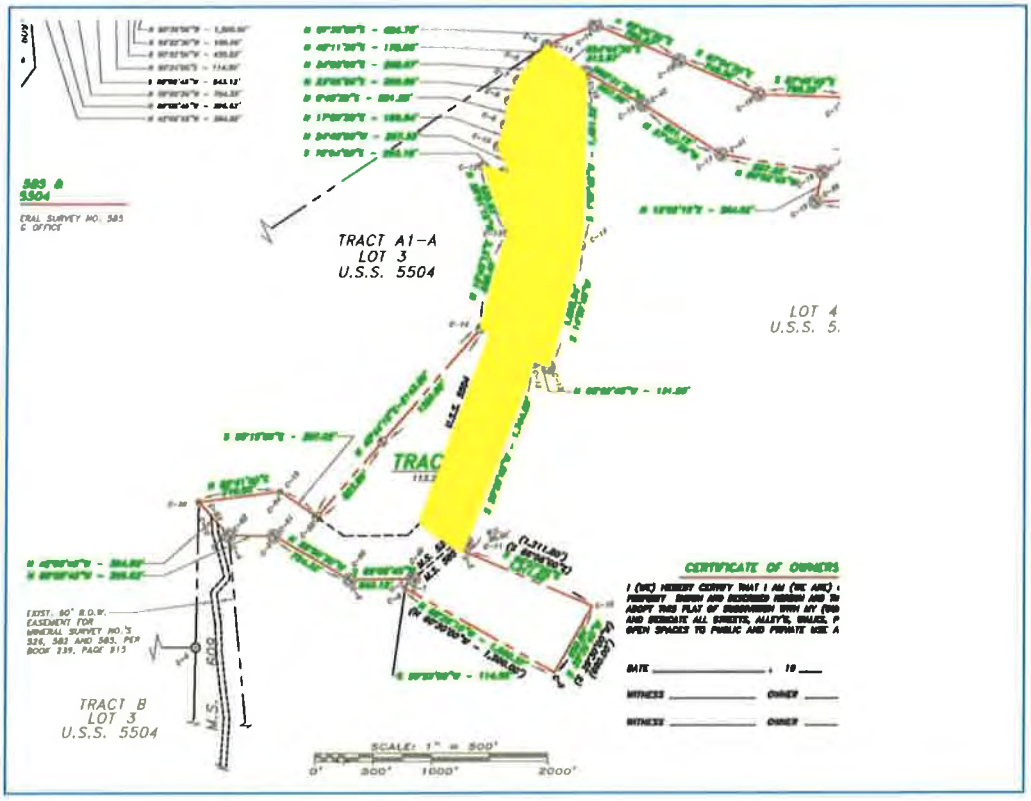


Image 2 - Plat of property with highlighted severance area

History of Lemon Creek

This area has a history of placer mining from the 1870's to the early 1900's. John Lemon prospected and placer mined this creek in the 1870's hence the naming of the creek. Placer claims were filed and recorded in the area starting in 1884. Mining continued for many years although it was not very productive.

Logging with a sawmill operation was active in the Lemon Creek area until the 1980's. Although logging in Hidden Valley did not occur until the mid-1980s.

Image 3 - Lemon Creek 1948

As can be seen in the photo above, in 1948 there was very little development in Lemon Creek. On the right side of image 3 the terraces eroded by Lemon Creek in Hidden Valley are visible. Most of the vegetation in the stream bottom is missing, giving it the light color in this black and white photo. On the left side of image 3, the aggradation of this alluvial material in the tide flats can be seen.

Image 4 - Lemon Creek 1962

By 1962 there was development occurring at Lemon Creek.

Image 5 - Lemon Creek 1984

Gravel extraction in Lower Lemon Creek for aggregate started during World War II. The mining of gravel occurred in several events until mid-1980. The method of gravel severance during this period was to divert Lemon Creek to one side of the creek bed. Then extract all the gravels across the width of the drainage, creating a long severance pit of where the streambeds used to be.

Image 6 - Lemon Creek 1988

Image 6 indicates that logging has occurred in Hidden Valley, refer to Image 3 – Lemon Creek 1948, from the tan area outlining Lemon Creek. In the picture, a bridge can be seen crossing Lemon Creek in Hidden Valley. The land that the logging occurred on are lands that are patented. The green trees that are left reside on governmental lands.

Image 7 - Lemon Creek Gravel Extraction 2015

In 2009, gravel extraction resumed between the Glacier Highway Bridge and the Lemon Creek Correctional Center in the lower reaches for flood control and aggregates for local use. This operation in the Lower Lemon Creek streambed is under permit USE 2012 0019.

These severance sites are accomplished in exposed reaches with an 11-foot setback from Lemon Creek. Bridges are put in to cross Lemon Creek, gaining access to the different severance sites. This has been a great benefit in keeping the streambed manageable, from flowing over its sides due to sedimentation.

The City and Borough of Juneau has three USE Permits in the Lemon Creek drainage that are above the ordinary high water of Lemon Creek. One is the old Lemon Creek Gravel Site by Costco and Home Depot, which is not being mined. The second is an active sand site known as North Lemon Creek Material Site USE2007-00015. North Lemon Creek Material Site is 65 acres and has approximately 3.5 to 4 million cubic yards of sand. The third is Lemon Creek in Hidden Valley USE2003-00045. This site is 30 acres in size with an estimated 1.64 million cubic yards of gravels, which has not been developed.

LOCATION; FEATURES; TOPOGRAPHY

The property is located at Township 40 South, Range 66 East, SE quadrant of Section 23 and Section 26. It is located in Hidden Valley which is 1.34 miles north of the intersection of Glacier Highway and Anka Street in the City and Borough of Juneau, Alaska.

The parcel containing the proposed severance site is 113.29 acres in size, is irregular in shape and is U.S.M.S. 526, a patented placer mining claim that straddles the streambed of Lemon Creek.

Image 8 - Distance form first severance area to nearest structure

The nearest habitable structure is the building at the gun range north of the Lemon Creek Correctional Center. It is roughly 4,250 feet southwest from the severance area.

The valley floor is roughly 500 feet wide on average east to west with glaciated banks of sand and gravel. Most of the banks have eroded faces and range from a few feet in height up to perhaps 50 feet in height. It is sloping from the north to the south and is about 3,200 feet in length before it narrows down through a gorge. The elevation at the north side of the property along the creek is roughly 175 feet. At the north property line of parcel M.S. 585 where it meets parcel M.S. 526 the creek has dropped in elevation to approximately 114 feet. The difference between the two elevations is 61 feet generating a 1.9% slope.

CBJ property Tract A1-A Lot 3 borders the northwest boundary. Currently CBJ has a Conditional USE2003 00045 permit for a borrow source of 1,640,000 cubic yards of sands and gravels to be extracted over 15 years. This is an average of 109,333 CY per year. The southwest area in Image 9 of the blue triangle is an elevated area of bedrock that is an existing quarry owned and operated by SECON. Bordering the triangle shaped area to the south is the start of the creek gorge. CBJs' property to the left of the blue triangle is the area for the Conditional USE permit of 1.6 million yards of sands and gravels.

MAP OF HIDDEN VALLEY WITH APPROXIMATE PROPERTY BOUNDARIES

Lemon Creek traverses Hidden Valley flats dividing the land into several areas. In the picture below the blue line is the western edge of Lemon Creek. This was "mapped" by walking along the creek with a handheld GPS in 2012. The picture image is dated about 2005. With the constraints of the property boundary, mountainsides and Lemon Creek the operation of gravel extraction is best designated as severance zones. Currently Lemon Creek has carved the valley into three severance zones that have areas large enough to support extraction of the dry gravel reaches.

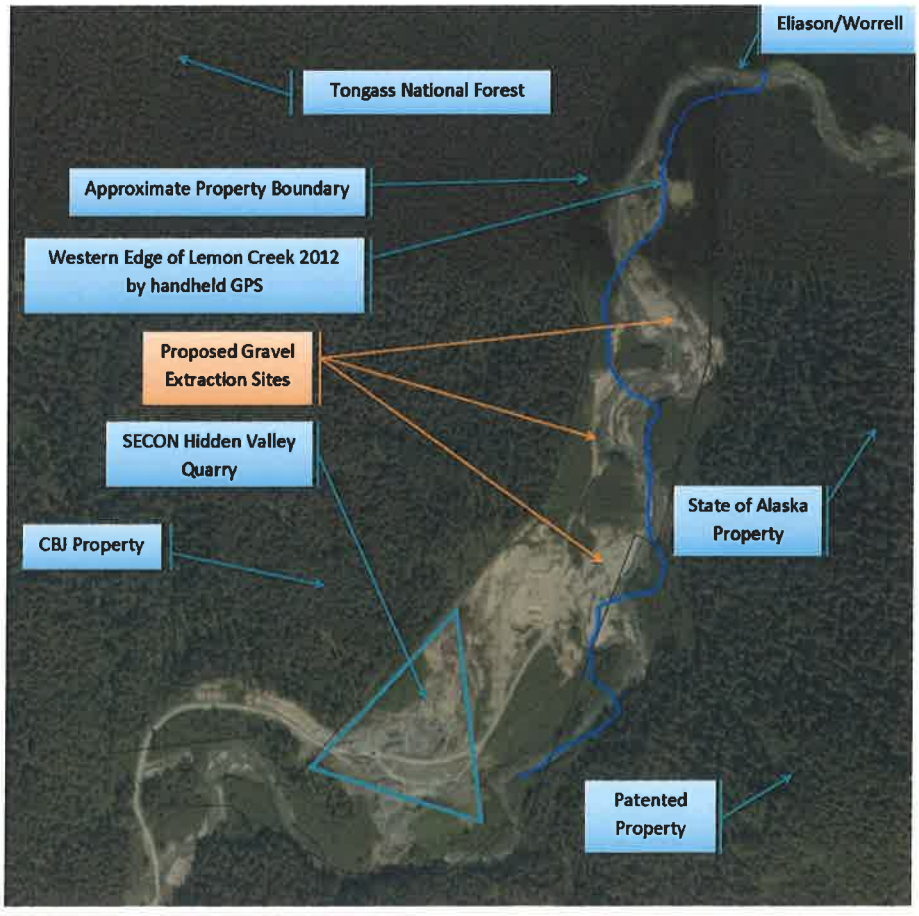


Image 9 - Location Map

Severance Zone 1

The first severance zone is located along the area where Secon stores equipment. The equipment storage area is elevated about 20 feet above Lemon Creek's flood plain. The storage area is irregular in shape yet follows the mountainside. This equipment storage area is bordered by a large flood plain of exposed gravel with Lemon Creek flowing to the opposite side of the valley. The area is about 8.2 acres in size after subtracting 30 feet for the habitat buffer zone[9]. This potentially has 198,000 cubic yards of gravel. The volume calculation is based on a continuous depth of 15 feet. The depth of 15 feet is not known but an estimate for calculation. Experience has shown that the subsurface stratum is neither uniform nor consistent in elevation. The actual cubic yards of gravel will be less if the estimated depth of 15 feet is accurate. This zone has an access to the flood plain in the form of a ramp from the equipment storage area.

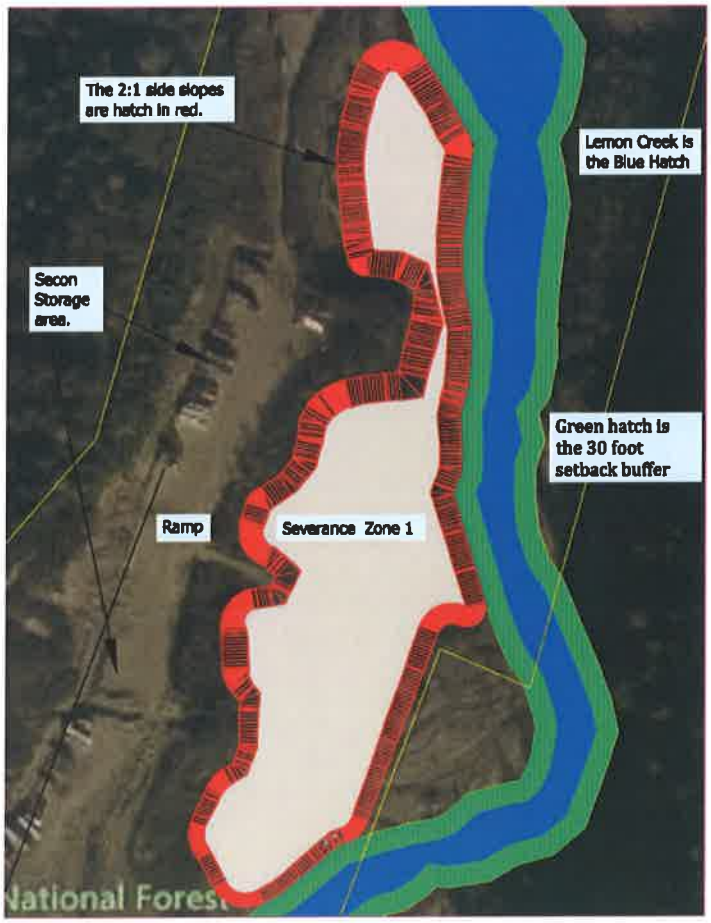


Image 10 - Severance Zone 1

[9] Alaska Department of Fish and Game in there permit reserves a 30-foot setback from the creek. This set back is to preserve the existing streambanks in the event of elevated stream flows, which occur throughout the season. It is also positionally dynamic as to the seasonally changing streambed location.

This severance zone would be Secon's first choice of gravel extraction. It has easy access and is close to our current quarry operations.

If Lemon Creek in Hidden Valley acts similar to lower Lemon Creek, the severance pits will refill annually during the spring flooding. Depending on how the severance pits replenish and what areas are viable for gravel severance, it may be possible to extract gravels from this first zone to satisfy the markets.

If the first severance zone becomes such that the gravels are not replenished but become fish habitat the second severance zone will become a viable option.

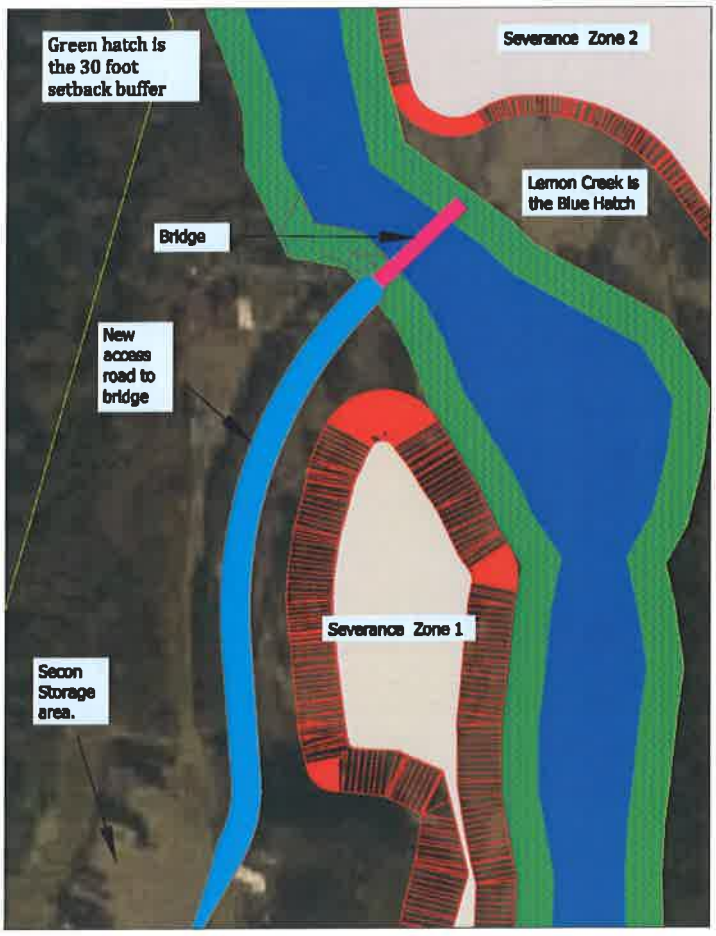


Image 11 - Access road and bridge location.

To reach this zone, Secon will be required to develop an access by building a bridge across Lemon Creek. At the north end of Secon's equipment storage area a ramp would be constructed to the flood plain. From there, a path bearing North Northeast would be cleared of Alders to reach Lemon Creek. At Lemon Creek, an embankment would be constructed to support a bridge.

Secon will decide whether to setup the bridge for short term or for the season. Short-term meaning of actual extraction duration in terms of days of actively mining and then removing the bridge once completed. This is the current protocol for accessing the different zones in Lemon Creek Gravel Extraction.

Installing the bridge for the season would be more involved however, it would be beneficial if the extraction process takes months to accomplish. It would require a higher embankment and possible armoring of the embankment with Rip Rap. This is to safeguard that the bridge is not threatened by elevated flow events from rains or glacier melts during the summer season.

Severance Zone 2

Once the access road is built and the bridge is installed the second severance zone can be staked with the Habitat Biologist[10]. This zone is more oval and can encompass roughly 4.8 acres in area. This has the potential of 116,000 cubic yards of material.

Image 12 - Severance Zone 2

[10] The Habitat Permit issued by the Alaska Department of Fish and Game states their Habitat Biologist will evaluate and stake the site with Secon as to the severance zones.

At the north edge of this zone is the start of an eroding bank that was formed when the creek radically changed is streambed in 2010. From the big bend at the north end of Secons' property to this severance zone is a bank that is currently eroding during high water events. This is the east side of Lemon Creek, or looking downstream, the left bank. The bank is only about 5 feet high at the north side of the severance zone, however, it increases to over 30 feet high at Secons' north property line.

Severance Zone 3

Severance zone 3 is located at the north end of Secons' property. To access this site, there are two possibilities. One, developing an access path from Severance zone 2 along the eastern property line and then installing a bridge to cross Lemon Creek. The second option is to use the path along the western side of the valley on an old logging road. There is still one small stream to cross with either a culvert or small bridge.

This severance zone has an area of about 2.7 acres. Which access is used will determine the severance area along with the setbacks from Lemon Creek and a small stream along the western edge. Currently it is shown as two zones to accommodate the bridge.

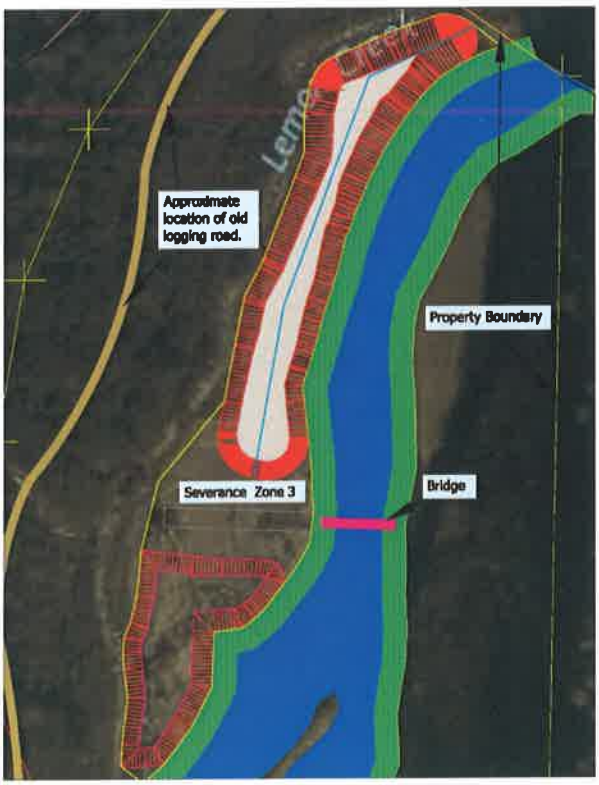


Image 13 - Severance Zone 3

This site would be the farthest from Secons' quarry operations but it also offers larger gravels and small boulders in its gravel bars.

Along the northwest side of this site, which is the left side in the image 14 photo, along the green trees is the old streambed for Lemon Creek. In winter of 2010/2011, the channel changed to its current location. In doing so, it moved roughly 180 feet to the southwest and scoured the current bed down into the gravels about 18 feet.

Image 14 shows the glacial terrace and moraines left from the last glaciers. Round cobbles and larger gravels are more resistive to the hydraulic erosion and now make up the bed of Lemon Creek. The smaller gravels, sands and silts have been conveyed downstream.

The cross hairs of image 14 is identified in Image 1 - Inter-Fluve, Inc. Lemon Creek Watershed Geomorphic Assessment and Sediment Management Alternatives Analysis Figure 3 as XS51. The bank on the rightside of the picture is XS50.

Image 14 - 2013 Lemon Creek Northside of Property.

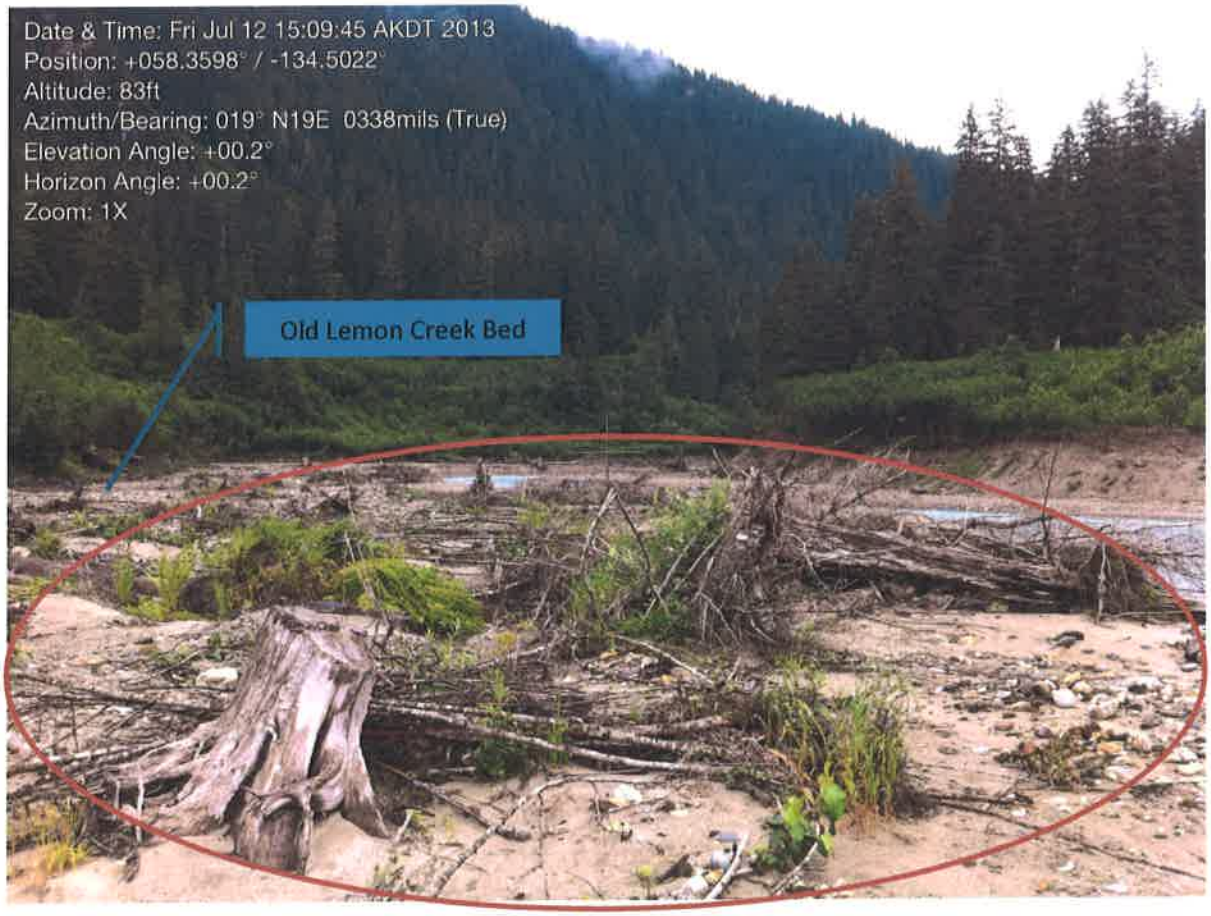


Image 15 - South end of Severance Zone 3 looking north

Image 15 shows the area is stripped of vegetation and topsoil. The remaining soils are sands with gravel and small cobbles.

As can be seen from the two images below the creek channel has changed a lot over the last several years. Image 16 is a google earth image of Lemon Creek from 2005 data. The blue line drawn on the photo is depicting the west side of Lemon Creek in 2012. The blue line was created by walking the creek bank with a Garmin GPS. The "bread crumbs" data was then uploaded to Google Earth. Tens of thousands cubic yards of sand and gravel have eroded from this valley and have been deposited in the lower reaches of Lemon Creek below the gorge out to the tide flats.

Image 16 -Hidden Valley 2005

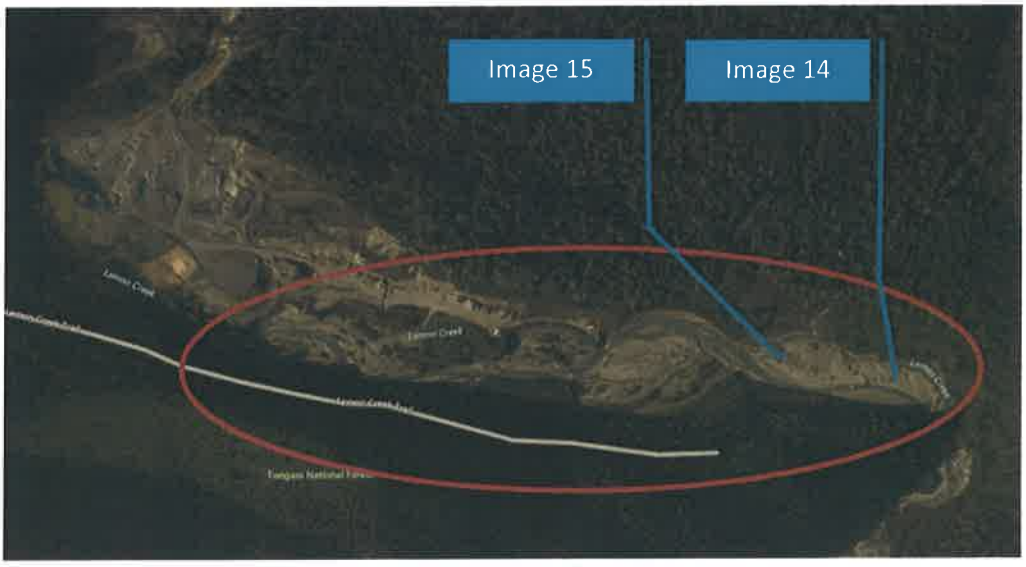


Image 17 - Hidden Valley 2011

ZONING

The areas where the severance will occur is zoned Rural Reserve, the same as the properties to the west, north or east. The property to the south, patented M.S. 609 owned by City and Borough of Juneau is zoned industrial.

CURRENT USE

The southwest portion of this property is an active quarry producing aggregate for local private and public projects.

The access road north of the quarry along the western side of Lemon Creek is used for equipment storage and has two areas that are leased to local businesses. These businesses have gated and/or fenced off areas for product storage.

Image 18 - Hidden Valley Equipment Storage

METHOD OF MINING

Prior to severance of materials ADF&G Habitat Division will be notified. The extraction site will be surveyed with a Habitat Biologist to determine what areas can be zoned for extraction. The site will be staked for property offset and buffer zone setback identified by the biologist.

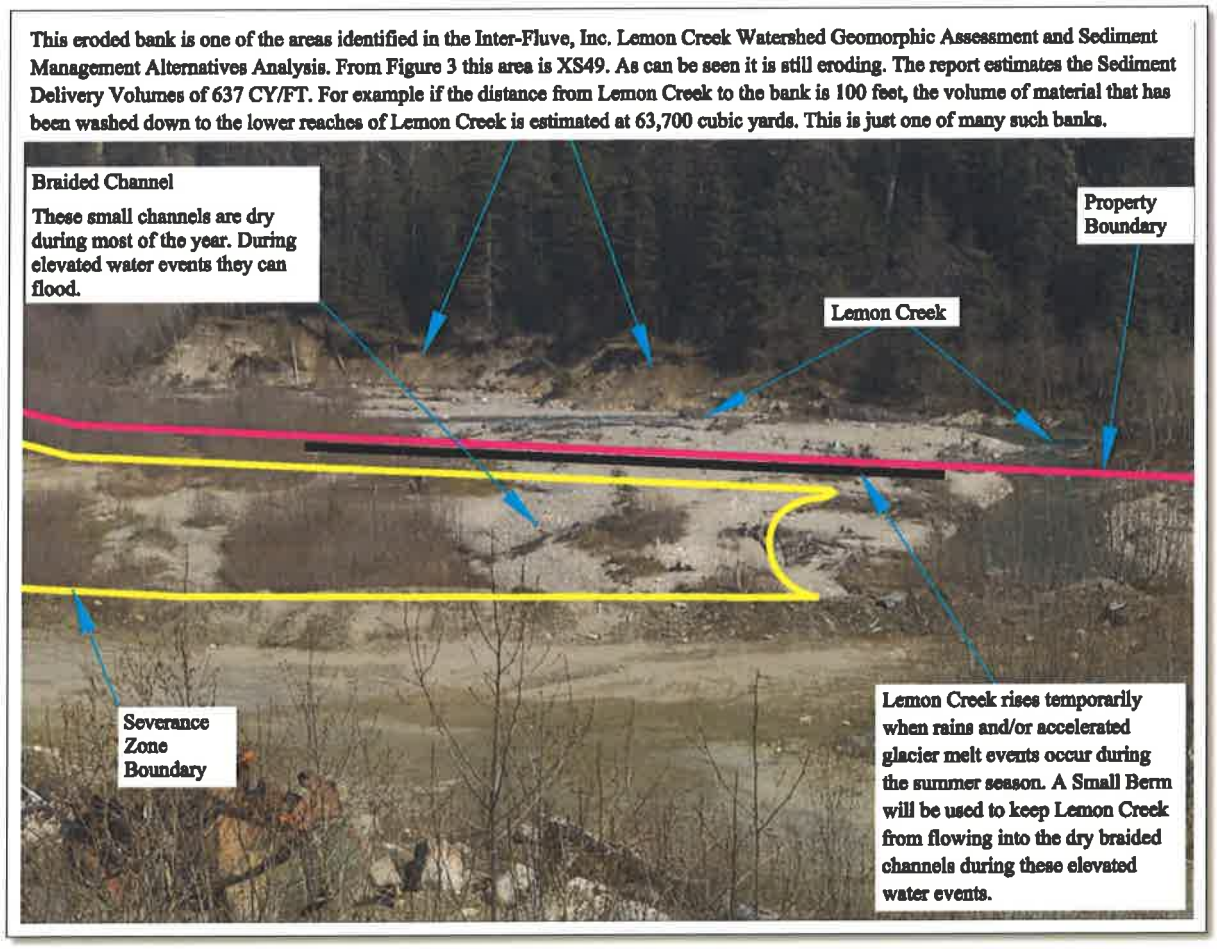


Image 19 - Severance Zone 1 diagram

These exposed gravel reaches are not fish habitat, even if the areas are submerged during spawning and the fish are able to lay eggs in the sands. They are dry for extended periods of time throughout the year and during the winter can freeze to several feet in depth.

Once the severance zone boundaries are staked the berms will be installed on the up-stream side of the excavation. This is to keep Lemon Creek from entering the severance area during elevated flows. The berm is temporary in nature and will be removed once the severance area is finished for the season. If Lemon Creek floods, the berm will be washed into the severance pit.

The mined gravels will be severed in one of two ways:

1. The gravels will be excavated and loaded into the conveyance unit in one operation.
2. Excavate the gravels into a surge stockpile next to the extraction pit. The stockpile is located next to the excavator. It is no more than two truckloads in size. The purpose of the surge pile is for gravels to have the opportunity to drain most of the water before being loaded into the conveyance unit. The gravels will be loaded and hauled to the wash plant site and stockpiled.

As can be seen in the photos to the right, the existing permitted operation in the Lower Lemon Creek streambed, USE 2012 0019 severance pit is full of water. This water is turbid and has suspended solids from all the extraction disturbance. It is critical to keep any inflow of water from the extraction pit. As long as the pit is excavated the water will stay in the severed site. If external inflows of water are allowed to enter the severance pond the turbid waters of the extraction pond will eventually escape and enter Lemon Creek. From Secons' experience in extracting gravels from Lemon Creek, if there is a problem with the turbid waters trying to leave the severance pond the answer is simply to setback 10 feet and start a new severance. The new severance will tend to create a hydraulic depression in the previous severance pit. This tends to keep the waters of the previous severance pond depressed and from overflowing to Lemon Creek. It also allows the water time to settle and clear if there continues to be a problem with the first severance pond.

Image 21 - Lemon Creek Gravel Extraction 2009

Image 20 - Lemon Creek Gravel Extraction 2013

Image 22 - Lemon Creek Gravel Extraction Pond May 2009

During the gravel extraction the severance zone pit is isolated from Lemon Creek. Once the severance zone is exhausted of gravels the berm will be removed. The severance pit suspended soilds and turbidity will begin to settle. Historically Lemon Creek Gravel Extraction severance ponds have, after one to two months, been clearer than Lemon Creek as it breaches the severance ponds. There is a notable difference between Lemon Creek and the still quiet of the severance ponds as far as turbidity.

Image 23 - Layout of operations

As can be seen in Image 23, the severed gravels are loaded into dump trucks as the conveyance unit of choice. The gravels are transported to a stockpile up out of the Lemon Creek flood plain. Currently there is an elevated bench about 20 feet higher in elevation than the flood plain of Lemon Creek. This bench is from 80 to 250 feet in width and a 1,000 feet long.

Secon will setup a wash plant at the Hidden Valley property for processing the material. The washplant site will be on a bench elevated as shown in the drawing below. A second choice for the washplant site would be the rock quarry. The materials would be trucked to the quarry site for processing there.

The equipment used to extract gravels from the exposed reaches will be any combination of the following:

- Large Excavator
- Large Dozer
- Large Loader
- 10 cubic yard end dumps
- 20 cubic yard end dumps
- 20 cubic yard side dumps
- Articulated Trucks

The conveyance units will haul the severed gravels to a wash plant and then be processed through a screen plant into different products. These products will be temporarily stockpiled at this location before being conveyed either to Aggpro or to a public project. Aggpro will market and sell to public works/maintenance departments and/or to the private sector.

Products made from the mined gravels.

1. Concrete aggregate
2. Concrete Sand
3. Asphalt Blend Sand
4. Washed Rock
5. Sand
6. Chips for winter sanding

The wash plant will be setup above the seasonal high water elevation. A water collection sump would be created. The plant would be in operation starting in the spring when temperatures stay above freezing and shut down in the fall when the temperatures start freezing once again.

No fueling of equipment will take place below ordinary high water.

TRAFFIC

The transporting route of the gravel products will be from the Hidden Valley on Anka Street to the intersection at Glacier Highway. The routes from the intersection will one of two possibilities. The first is to turn right on Glacier Highway then turning left onto Concrete Way ending at Aggpro's site at 5771 Concrete Way. The second would be to turn left onto Glacier Highway and proceed to Vanderbilt Hill Road then to Egan Drive for delivery to a project. These routes are same as Secon's Hidden Valley Quarry and City & Borough of Juneau's North Lemon Creek Material Site.

SECON
SOUTHEAST ALASKA

RESTORATION

The bridge and abutments will be removed. Embanked berms and fills will be removed from Lemon Creek flood plain. Severance voids will be allowed to naturally be filled in by Lemon Creek.

CURRENT PERMITS HELD BY SECON

Fish Habitat Permit FH15-I-0141

US Army Corps of Engineers, Alaska District Permit: POA-2014-547

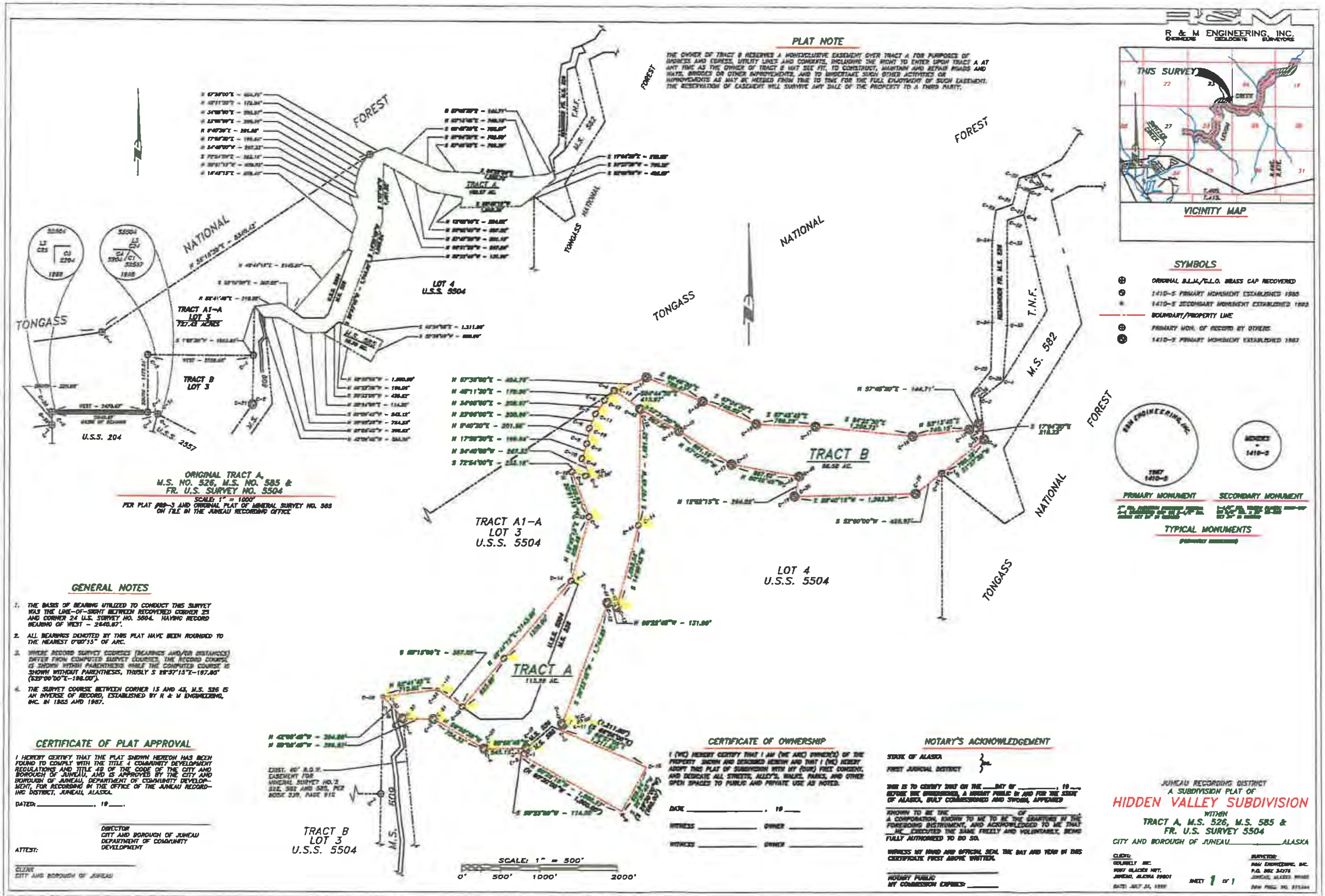
Alaska Department of Environmental Conservation - Division of Water - Wastewater Discharge Authorization Program, Section 401 Reasonable Assurance

ATTACHMENTS:

- Plat of Hidden Valley Subdivision
- Site Plans
- Fish Habitat Permit
- US Army Corps of Engineers Permit

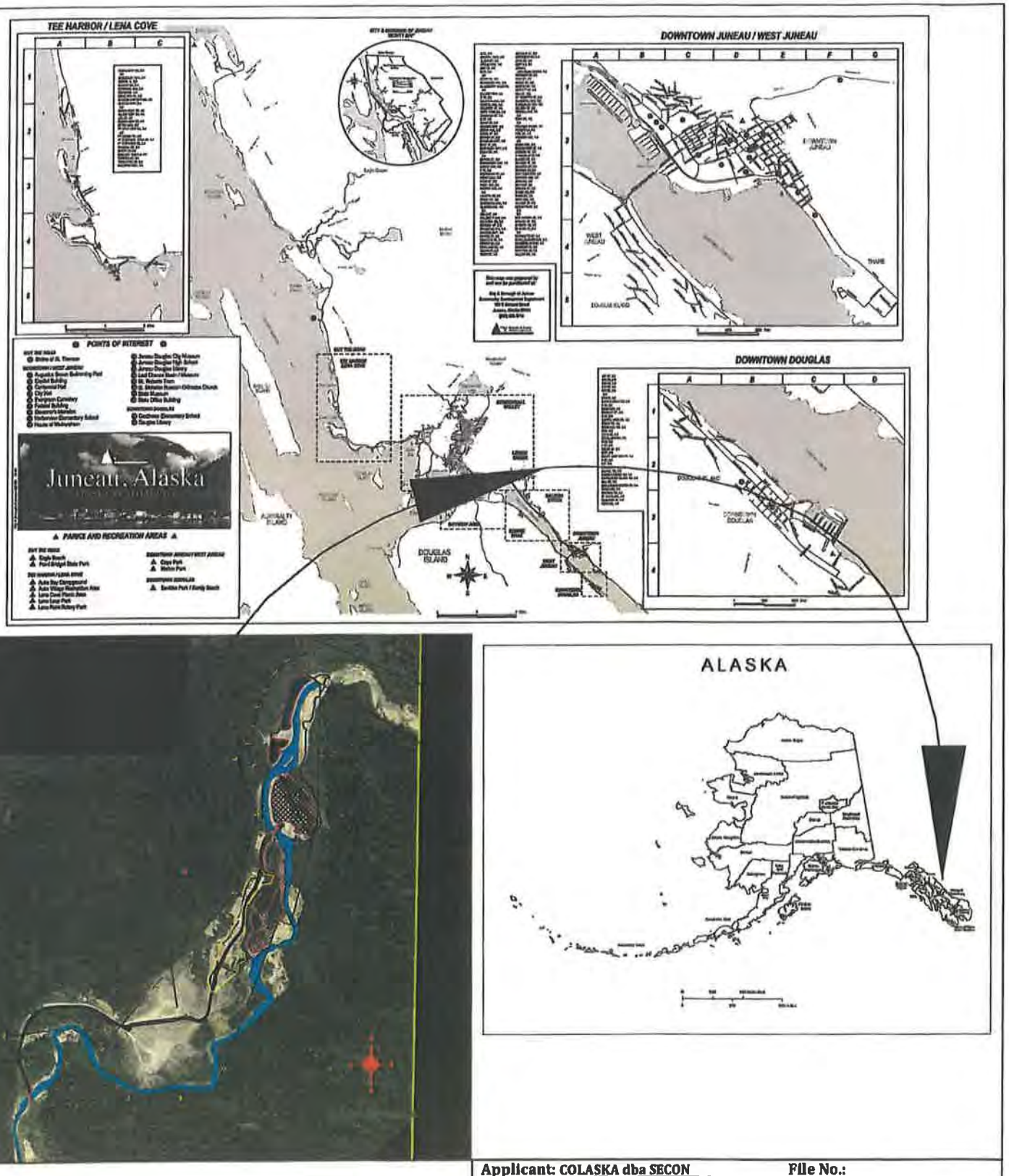
Attachment 1

Plat of Hidden Valley Subdivision


R & M ENGINEERING, INC.
ENGINEERS GEOLOGISTS SURVEYORS
THIS SURVEY
VICINITY MAP
SYMBOLS
ORIGINAL B.L.M./G.L.O. BRASS CAP RECOVERED
1410-S PRIMARY MONUMENT ESTABLISHED 1985
1410-S SECONDARY MONUMENT ESTABLISHED 1985
BOUNDARY/PROPERTY LINE
PRIMARY MON. OF RECORD BY OTHERS
1410-S PRIMARY MONUMENT ESTABLISHED 1987
PRIMARY MONUMENT
SECONDARY MONUMENT
TYPICAL MONUMENTS
PLAT NOTE
THE OWNER OF TRACT B RESERVES A NONEXCLUSIVE EASEMENT OVER TRACT A FOR PURPOSES OF INGRESS AND EGRESS, UTILITY LINES AND CONDUITS, INCLUDING THE RIGHT TO ENTER UPON TRACT A AT ANY TIME AS THE OWNER OF TRACT B MAY SEE FIT, TO CONSTRUCT, MAINTAIN AND REPAIR ROADS AND WAYS, BRIDGES OR OTHER IMPROVEMENTS, AND TO UNDERTAKE SUCH OTHER ACTIVITIES OR IMPROVEMENTS AS MAY BE NEEDED FROM TIME TO TIME FOR THE FULL ENJOYMENT OF SUCH EASEMENT. THE RESERVATION OF EASEMENT WILL SURVIVE ANY SALE OF THE PROPERTY TO A THIRD PARTY.
TONGASS NATIONAL FOREST
T.N.F.
M.S. 582
M.S. 609
TRACT A
TRACT B
TRACT A1-A
LOT 3
U.S.S. 5504
LOT 4
U.S.S. 5504
TRACT B
LOT 3
U.S.S. 5504
U.S.S. 204
U.S.S. 2557
ORIGINAL TRACT A,
M.S. NO. 526, M.S. NO. 585 &
FR. U.S. SURVEY NO. 5504
SCALE: 1" = 1000'
PER PLAT 88-3 AND ORIGINAL PLAT OF MINERAL SURVEY NO. 585 ON FILE IN THE JUNEAU RECORDING OFFICE
SCALE: 1" = 500'
0' 500' 1000' 2000'
GENERAL NOTES
1. THE BASIS OF BEARING UTILIZED TO CONDUCT THIS SURVEY WAS THE LINE-OF-SIGHT BETWEEN RECOVERED CORNER 23 AND CORNER 24 U.S. SURVEY NO. 5504. HAVING RECORD BEARING OF WEST – 2640.87'.
2. ALL BEARINGS DENOTED BY THIS PLAT HAVE BEEN ROUNDED TO THE NEAREST 0°00'15" OF ARC.
3. WHERE RECORD SURVEY COURSES (BEARINGS AND/OR DISTANCES) DIFFER FROM COMPUTED SURVEY COURSES, THE RECORD COURSE IS SHOWN WITHIN PARENTHESIS WHILE THE COMPUTED COURSE IS SHOWN WITHOUT PARENTHESIS, THUSLY S 28°37'15"E–197.85' (S29°00'00"E–198.00').
4. THE SURVEY COURSE BETWEEN CORNER 15 AND 43, M.S. 526 IS AN INVERSE OF RECORD, ESTABLISHED BY R & M ENGINEERING, INC. IN 1985 AND 1987.
CERTIFICATE OF PLAT APPROVAL
I HEREBY CERTIFY THAT THE PLAT SHOWN HEREON HAS BEEN FOUND TO COMPLY WITH THE TITLE 4 COMMUNITY DEVELOPMENT REGULATIONS AND TITLE 49 OF THE CODE OF THE CITY AND BOROUGH OF JUNEAU, AND IS APPROVED BY THE CITY AND BOROUGH OF JUNEAU, DEPARTMENT OF COMMUNITY DEVELOPMENT, FOR RECORDING IN THE OFFICE OF THE JUNEAU RECORDING DISTRICT, JUNEAU, ALASKA.
DATED: ____________, 19____.
DIRECTOR
CITY AND BOROUGH OF JUNEAU
DEPARTMENT OF COMMUNITY DEVELOPMENT
ATTEST:
CLERK
CITY AND BOROUGH OF JUNEAU
CERTIFICATE OF OWNERSHIP
I (WE) HEREBY CERTIFY THAT I AM (WE ARE) OWNER(S) OF THE PROPERTY SHOWN AND DESCRIBED HEREON AND THAT I (WE) HEREBY ADOPT THIS PLAT OF SUBDIVISION WITH MY (OUR) FREE CONSENT, AND DEDICATE ALL STREETS, ALLEY'S, WALKS, PARKS, AND OTHER OPEN SPACES TO PUBLIC AND PRIVATE USE AS NOTED.
DATE ____________, 19____
WITNESS ________ OWNER ________
WITNESS ________ OWNER ________
NOTARY'S ACKNOWLEDGEMENT
STATE OF ALASKA
FIRST JUDICIAL DISTRICT
THIS IS TO CERTIFY THAT ON THE ___DAY OF ________, 19___, BEFORE ME THE UNDERSIGNED, A NOTARY PUBLIC IN AND FOR THE STATE OF ALASKA, DULY COMMISSIONED AND SWORN, APPEARED
KNOWN TO BE THE ________ OF ________, A CORPORATION, KNOWN TO ME TO BE THE GRANTORS IN THE FOREGOING INSTRUMENT, AND ACKNOWLEDGED TO ME THAT ___HE EXECUTED THE SAME FREELY AND VOLUNTARILY, BEING FULLY AUTHORIZED TO DO SO.
WITNESS MY HAND AND OFFICIAL SEAL THE DAY AND YEAR IN THIS CERTIFICATE FIRST ABOVE WRITTEN.
NOTARY PUBLIC
MY COMMISSION EXPIRES: ______
JUNEAU RECORDING DISTRICT
A SUBDIVISION PLAT OF
HIDDEN VALLEY SUBDIVISION
WITHIN
TRACT A, M.S. 526, M.S. 585 &
FR. U.S. SURVEY 5504
CITY AND BOROUGH OF JUNEAU ________ ALASKA
CLIENT:
SURVEYOR:
SHEET 1 OF 1

Attachment 2

Site Plans



Colaska dba Secon Property
Tract A, U.S. Survey 5504, M.S. 526
City and Borough of Juneau, Alaska

Applicant: COLASKA dba SECON
File No.:
Waterway: Lemon Creek
Date: 9/29/15
Proposed Activity: Gravel Extraction
Sec. 26 **T.** 40S **R.** 66E **Meridian:** Copper River
Lat.: 58° 22' 18" **Long.:** 134° 7' 59"
Sheet: Vicinity Map
Sheet 1 of 8

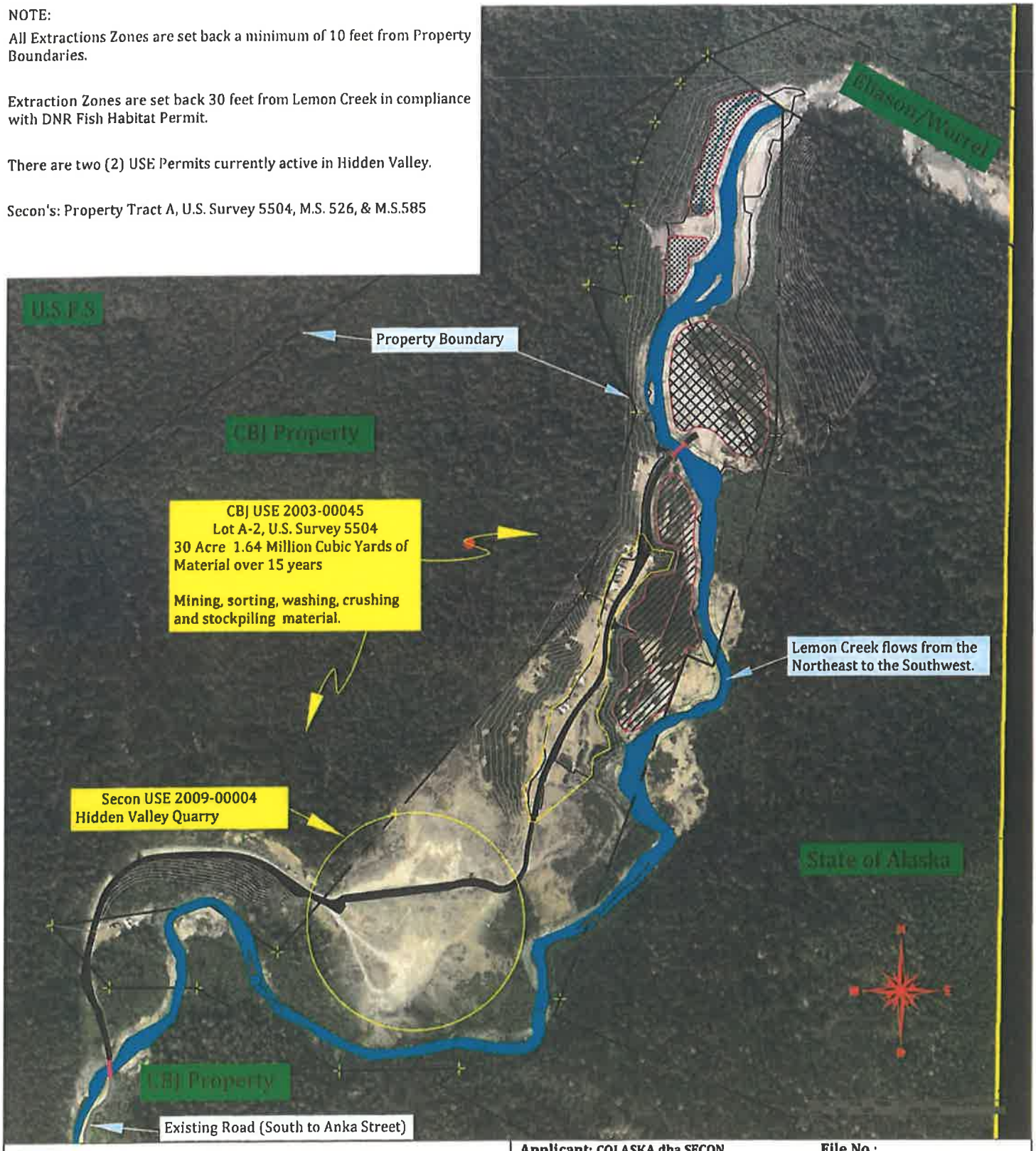
NOTE:

All Extractions Zones are set back a minimum of 10 feet from Property Boundaries.

Extraction Zones are set back 30 feet from Lemon Creek in compliance with DNR Fish Habitat Permit.

There are two (2) USE Permits currently active in Hidden Valley.

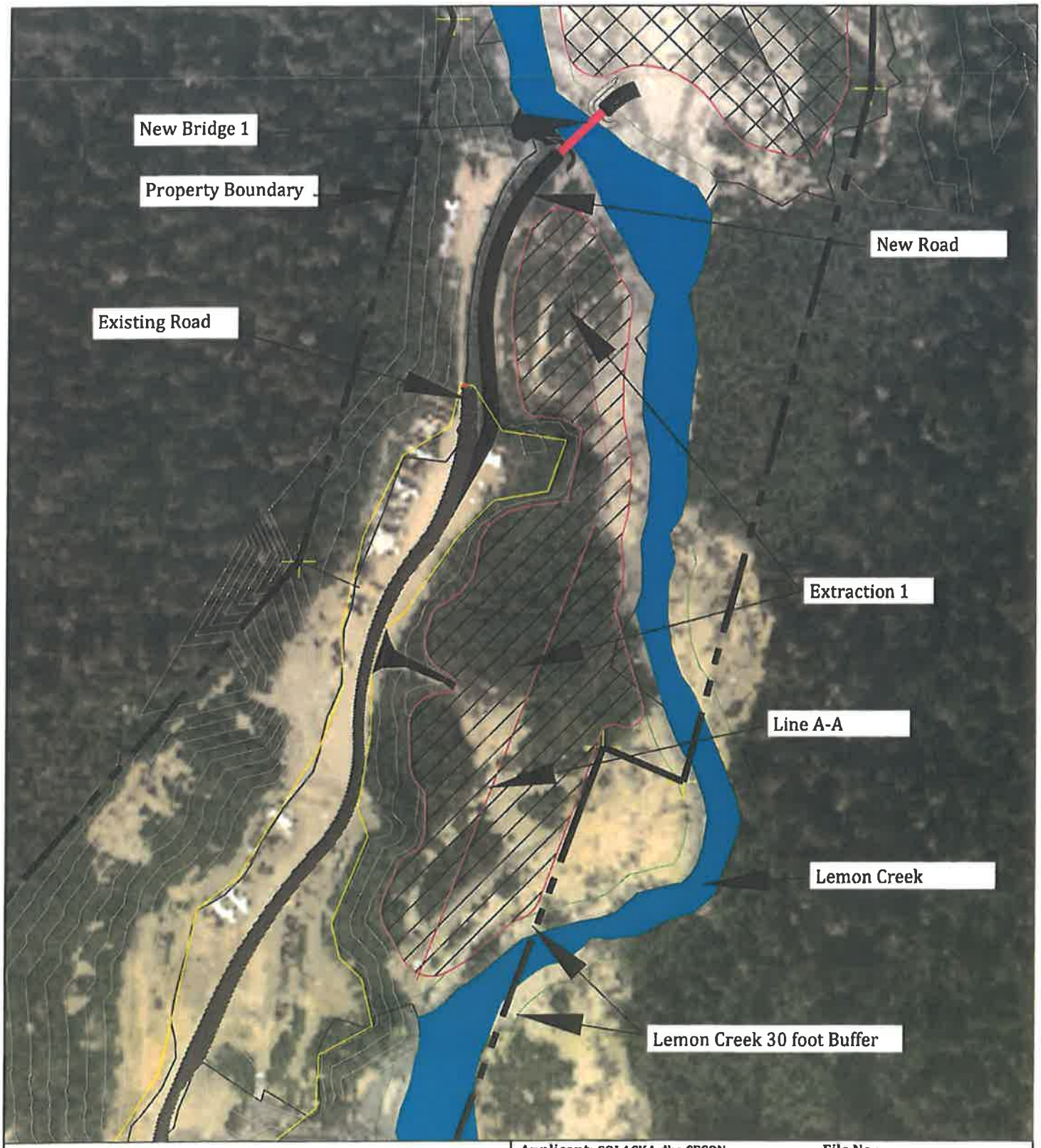
Secon's: Property Tract A, U.S. Survey 5504, M.S. 526, & M.S.585



E1 - 5.25 Acres, Volume - 149,243 CY
E2 - 4.76 Acres, Volume - 120,057 CY
E3 - 1.37 Acres, Volume - 33,777 CY

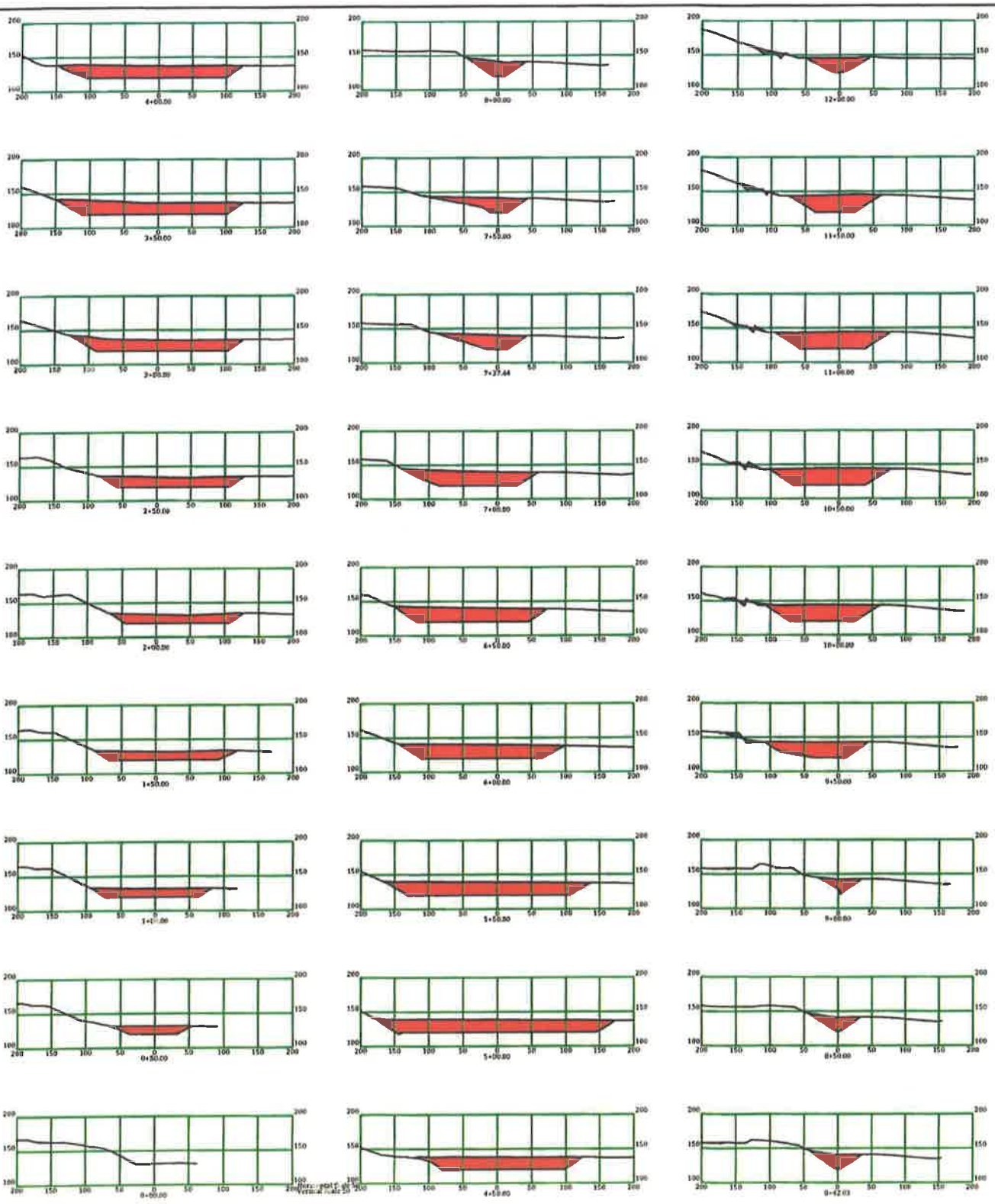
Applicant: COLASKA dba SECON
Waterway: Lemon Creek
Proposed Activity: Gravel Extraction
Sec. 26 T. 40S R. 66E **Meridian:** Copper River
Sheet: Plan Veiw

File No.:
Date: 9/29/15
Lat.: 58° 22' 18" **Long.:** 134° 7' 59"
Sheet 2 of 8



Extraction Zone 1 (E1) Section Line

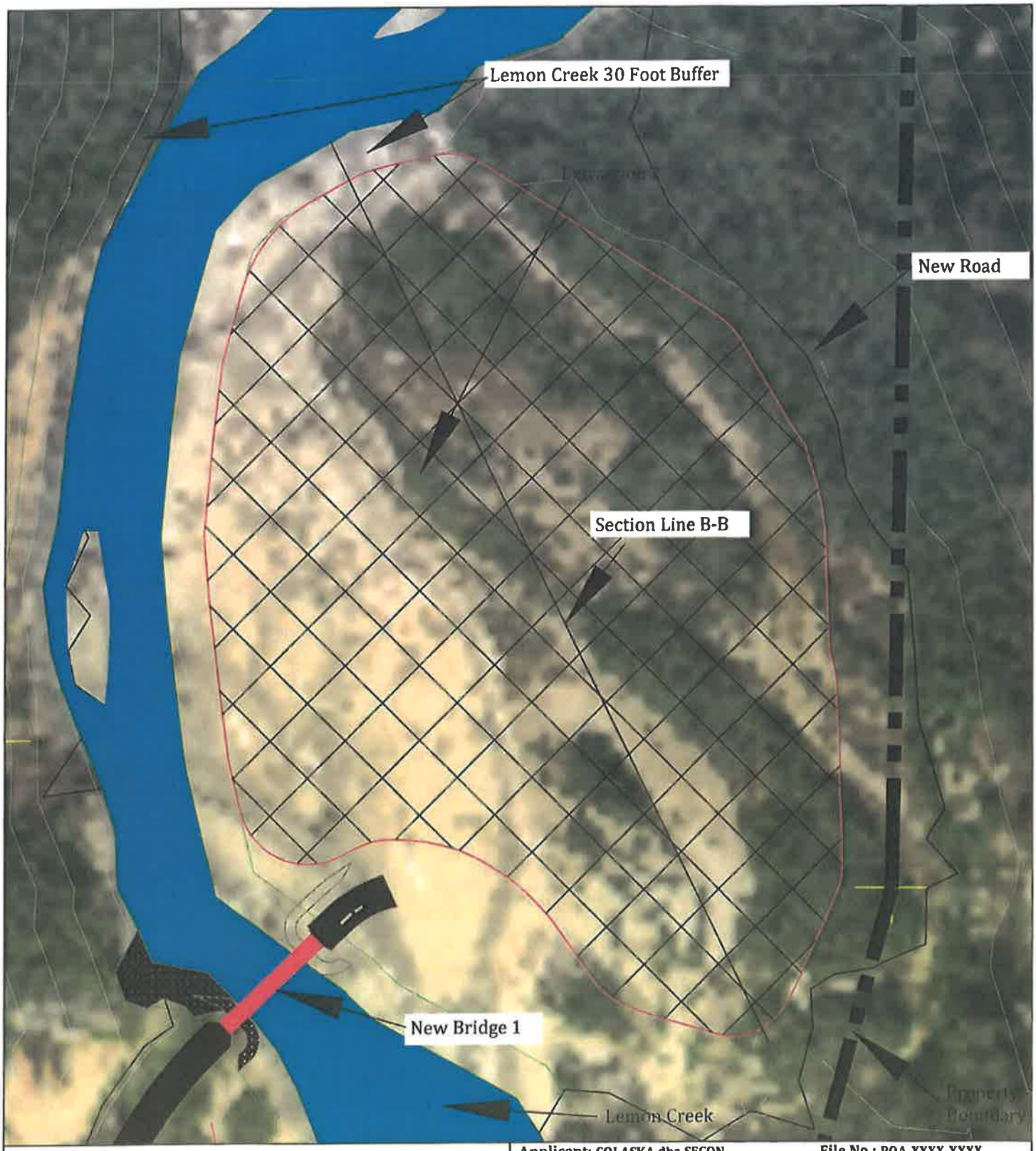
Applicant: COLASKA dba SECON
File No.:
Waterway: Lemon Creek
Date: 9/29/15
Proposed Activity: Gravel Extraction
Sec. 26 T. 40S R. 66E **Meridian:** Copper River
Lat.: 58° 22' 18" **Long.:** 134° 7' 59"
Sheet: E1 Cross Section Map
Sheet 3 of 8



Extraction Zone 1 (E1)
Cross Sections of Line A-A

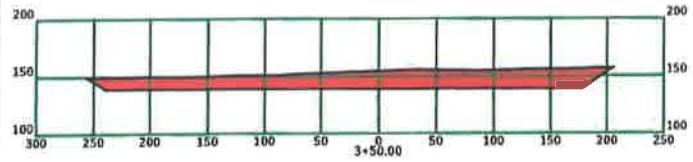
Applicant: COLASKA dba SECON
Waterway: Lemon Creek
Proposed Activity: Gravel Extraction
Sec. 26 T. 40S R. 66E **Meridian:** Copper River
Sheet: E1 Cross Sections

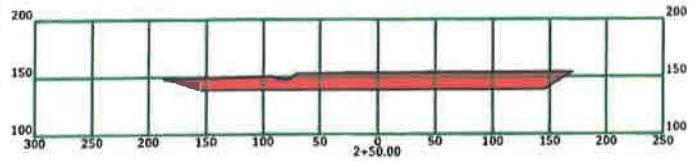
File No.: POA-XXXX-XXXX
Date: 9/29/15
Lat.: 58° 22' 18" Long.: 134° 7' 59"
Sheet 4 of 8

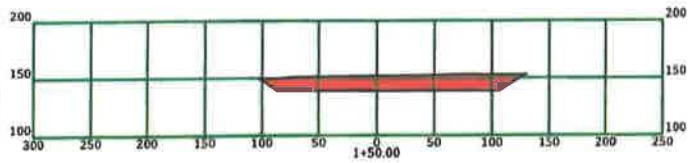


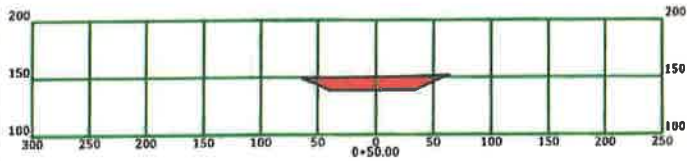
Extraction Zone 2 (E2) Section Line

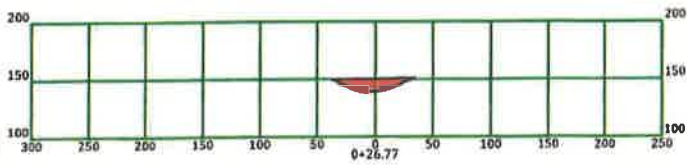
Applicant: COLASKA dba SECON
File No.: POA-XXXX-XXXX
Waterway: Lemon Creek
Date: 9/29/15
Proposed Activity: Gravel Extraction
Sec. 26 T. 40S R. 66E **Meridian:** Copper River
Lat.: 58° 22' 18" **Long.:** 134° 7' 59"
Sheet: E2 Cross Section Map
Sheet 5 of 8

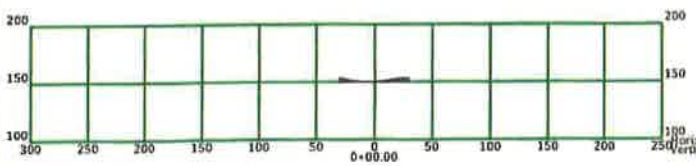


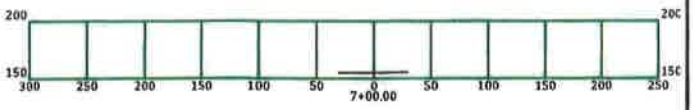


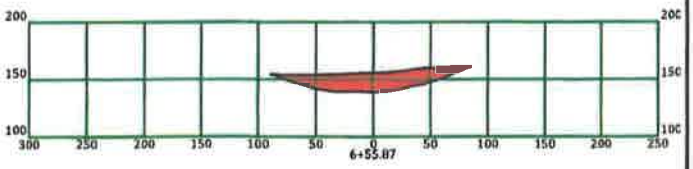


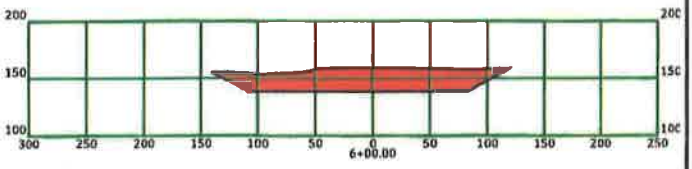


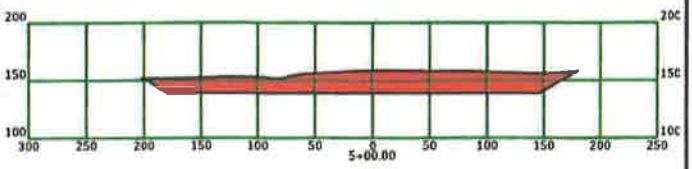


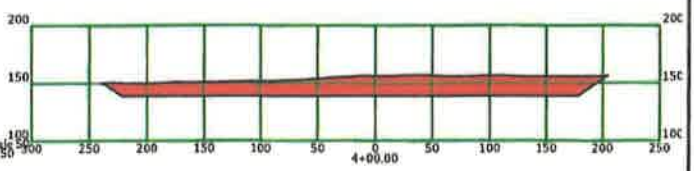








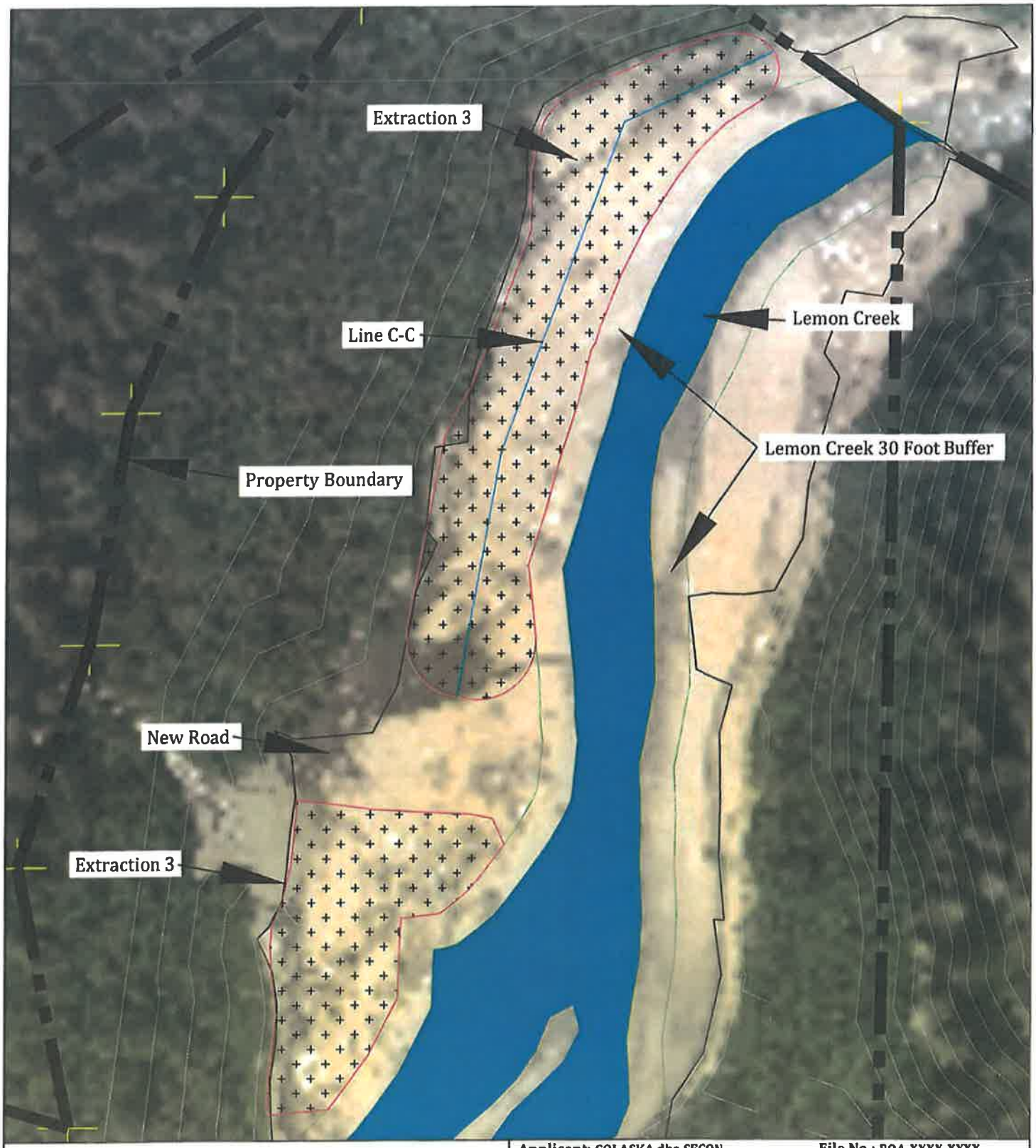




Extraction Zone 2 (E2)
Cross Sections of Line B-B

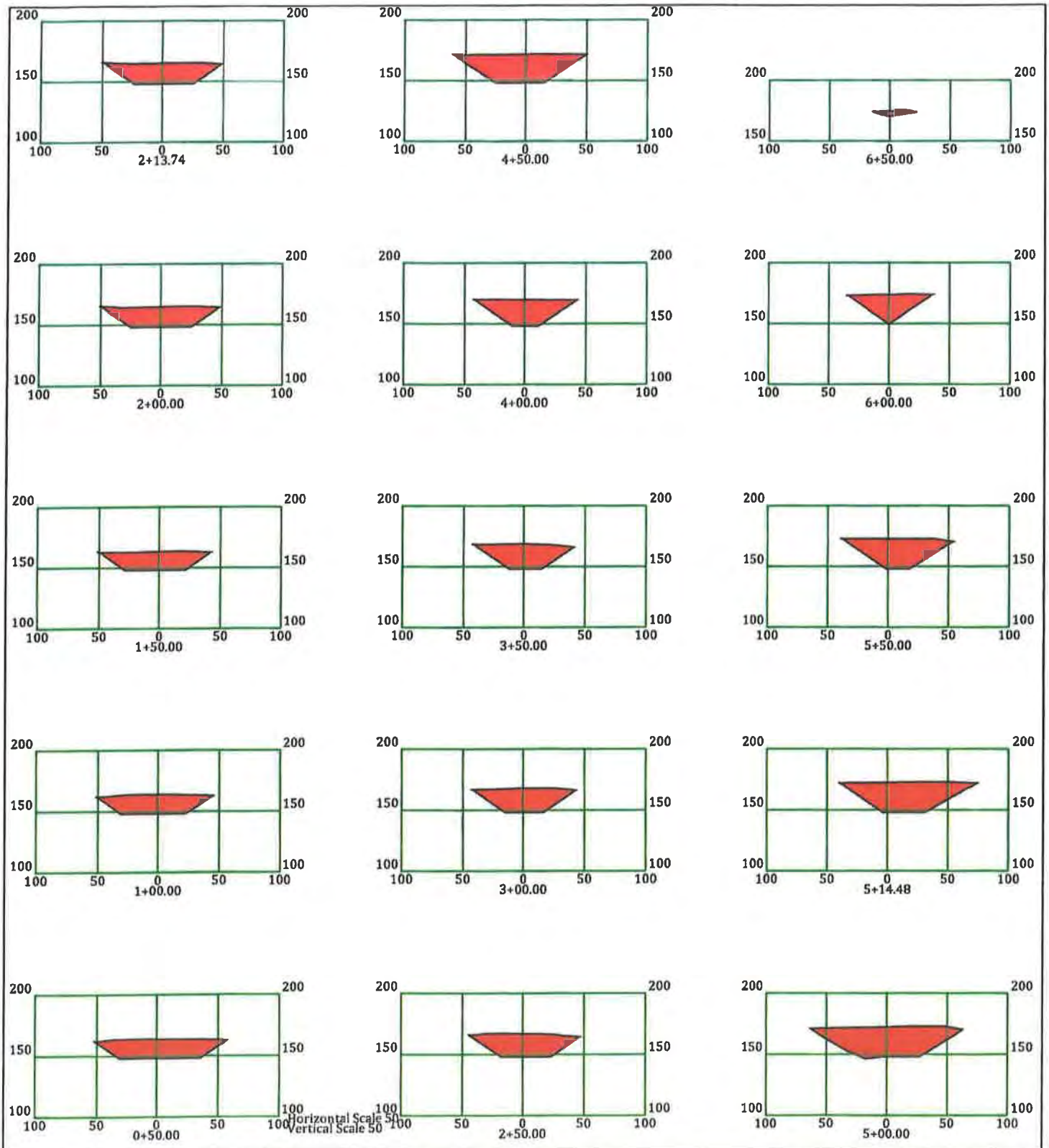
Applicant: COLASKA dba SECON
Waterway: Lemon Creek
Proposed Activity: Gravel Extraction
Sec. 26 **T.** 40S **R.** 66E **Meridian:** Copper River
Sheet: E2 Cross Sections

File No.: POA-XXXX-XXXX
Date: 9/29/15
Lat.: 58° 22' 18" **Long.:** 134° 7' 59"
Sheet 6 of 8



Extraction Zone 3 (E3) Section Line

Applicant: COLASKA dba SECON
File No.: POA-XXXX-XXXX
Waterway: Lemon Creek
Date: 9/29/15
Proposed Activity: Gravel Extraction
Sec. 26 T. 40S R. 66E **Meridian:** Copper River
Lat.: 58° 22' 18" **Long.:** 134° 7' 59"
Sheet: E3 Cross Section Map
Sheet 7 of 8



Extraction Zone 3 (E3) Cross Sections

Applicant: COLASKA dba SECON
File No.: POA-XXXX-XXXX
Waterway: Lemon Creek
Date: 9/29/15
Proposed Activity: Gravel Extraction
Sec. 26 T. 40S R. 66E **Meridian:** Copper River
Lat.: 58° 22' 18" **Long.:** 134° 7' 59"

Sheet: E3 Cross Section

Attachment 3

Fish Habitat Permit

THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Fish and Game
DIVISION OF HABITAT
Southeast Region Office
802 3rd Street
Douglas, AK 99824-5412
P.O. Box 110024
Juneau, Alaska 99811-0024
Main: 907.465.4105
Fax: 907.465.4759

FISH HABITAT PERMIT FH15-I-0141

ISSUED: September 21, 2015

Mr. Michael Short
SECON Engineering Manager
P.O. Box 32159
Juneau, AK 99801

RE: Hidden Valley Gravel Mine in Lemon Creek
Stream No. 111-40-10100
T. 40 S., R. 66 E., Section 26, C.R.M., Juneau B-2
58.3776° N, 134.4642° W

Dear Mr. Short:

Pursuant to AS 16.05.871(b), the Alaska Department of Fish and Game (ADF&G) Division of Habitat reviewed your proposal to mine sand and gravel on SECON's patented property within the ordinary high water marks of Lemon Creek in Hidden Valley.

Project Description

You will use excavators and dump trucks to mine material each year from islands within upper Lemon Creek. You will begin mining at the downstream end of the gravel bars and move upstream, leaving 30 foot buffers between the mine and active Lemon Creek channels. You will construct temporary diversion berms in dry channels upstream to protect the mine site from rising water and breach the berms when mining is complete.

You will build bridges across active channels using flatcars supported by log and gravel abutments. You will leave mine site organics on the floodplain. If flow begins to erode bridge abutments, buffers, or berms, you will remove bridges and equipment from below the ordinary high water mark of Lemon Creek.

You will meet with a habitat biologist each year prior to mining to review the mining plan and stake mine site limits. You will accompany habitat biologists monitoring Lemon Creek during mining.

Anadromous Fish Act

Lemon Creek, Stream No. 111-40-10100, is important for the spawning, rearing, and migration of anadromous fish, pursuant to AS 16.05.871(a). Adult coho salmon spawn in this portion of Lemon Creek from August through November and juvenile coho salmon and resident Dolly Varden char rear in the area year-round.

In accordance with AS 16.05.871(d), gravel mining in Lemon Creek in Hidden Valley is approved subject to the project description and the terms of this permit.

You must maintain the habitat in Lemon Creek in accordance with the terms of this permit so that free passage of fish is assured. You must restore any obstruction to the free passage of fish to the satisfaction of ADF&G.

You are responsible for the actions of contractors, agents, or other persons who perform work to accomplish the approved project. For any activity that significantly deviates from the approved plan, you shall notify the Division of Habitat and obtain written approval in the form of a permit amendment before beginning the activity. Any action that increases the project's overall scope or that negates, alters, or minimizes the intent or effectiveness of any stipulation contained in this permit will be deemed a significant deviation from the approved plan. The final determination as to the significance of any deviation and the need for a permit amendment is the responsibility of the Division of Habitat. Therefore, it is recommended you consult the Division of Habitat immediately when a deviation from the approved plan is being considered.

For the purpose of inspecting or monitoring compliance with any condition of this permit, you shall give an authorized representative of the state free and unobstructed access, at safe and reasonable times, to the permit site. You shall furnish whatever assistance and information as the authorized representative reasonably requires for monitoring and inspection purposes.

This letter constitutes a permit issued under the authority of AS 16.05.871 and must be retained on site during project activities. Please be advised that this determination applies only to activities regulated by the Division of Habitat; other agencies also may have jurisdiction under their respective authorities. This determination does not relieve you of your responsibility to secure other permits; state, federal, or local. You are still required to comply with all other applicable laws.

In addition to the penalties provided by law, this permit may be terminated or revoked for failure to comply with its provisions or failure to comply with applicable statutes and regulations. The department reserves the right to require mitigation measures to correct disruption to fish and game created by the project and which was a direct result of the failure to comply with this permit or any applicable law.

You shall indemnify, save harmless, and defend the department, its agents, and its employees from any and all claims, actions, or liabilities for injuries or damages sustained by any person or property arising directly or indirectly from permitted activities or your performance under this permit. However, this provision has no effect if, and only if, the sole proximate cause of the injury is the department's negligence.

This permit decision may be appealed in accordance with the provisions of AS 44.62.330-630.

Any questions or concerns about this permit may be directed to Greg Albrecht at (907) 465-6384 or emailed to greg.albrecht@alaska.gov.

Sincerely,
Sam Cotten
Commissioner

By Jackie Timothy
Southeast Regional Supervisor

Email cc:

Al Ott, ADF&G Habitat, Fairbanks
ADF&G Habitat Staff, Juneau
Dan Teske, ADF&G/SF, Juneau
Dave Harris, ADF&G/CF, Juneau
Stephanie Sell, ADF&G/WC, Juneau
Steve Brockmann, USFWS, Juneau
Linda Speerstra, USACE, Sitka
Cindy Hartmann Moore, NMFS, Juneau
Teri Camery, CBJ, Juneau

Attachment 4

US Army Corps of Engineers Permit

DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
P.O. BOX 22270
JUNEAU, ALASKA 99802

September 16, 2015

Regulatory Division
POA-2014-547

Mr. Tim Dudley
Colaska dba SECON
P.O. Box 32159
Juneau, Alaska 99803

Dear Mr. Dudley:

This is in response to your, application for a Department of the Army (DA) permit to discharge 2,800 cubic yards of dredged and fill material into 21,275-square feet of waters of the U.S. below the Ordinary High Water of Lemon Creek in order to construct gravel mining access roads. It has been assigned file number POA-2014-547, Lemon Creek which should be referred to in all future correspondence with this office. The project site is located within Section 26, T. 40 S., R. 66 E., Copper River Meridian; USGS Quad Map Juneau B-2; Latitude 58.37334° N., Longitude -134.46598° W.; located in Juneau, Alaska.

Based on our review of the information you furnished and available to us and our July 21, 2015 site visit, we have preliminarily determined the above project area contains waters of the United States (U.S.), under the Corps' regulatory jurisdiction (Please see the attached Preliminary Jurisdictional Determination Form).

DA permit authorization is necessary because your project involves the placement of dredged and fill material into waters of the U.S. under our regulatory jurisdiction.

Specifically the work includes the construction of two access ramps from uplands into Lemon Creek measuring 60 feet long by 30 feet wide, two berm areas measuring 530 linear feet to protect the mining site from flooding, construction and armoring of a primary access road, bridge, and bridge abutments measuring 600 linear feet. The work would result in the placement of 2,800 cubic yards of rock and rip rap into 21,275 square feet of waters of the U.S.

Based upon the information and plans you provided, we hereby verify that the work described above, which would be performed in accordance with the enclosed plan (sheets 1-4), dated August 2015, is authorized by Nationwide Permit (NWP) No. 14, Linear Transportation Projects. NWP No. 14 and its associated Regional and General

Conditions can be accessed at our website at: www.poa.usace.army.mil/Missions/Regulatory/Permits.aspx. Regional Conditions **F** apply to your project. You must comply with all terms and conditions associated with NWP No. 14.

Further, please note General Condition 30 requires that you submit a signed certification to us once any work and required mitigation are completed. Enclosed is the form for you to complete and return to us.

The Nationwide Permits are due to expire on March 18, 2017, unless the NWP is modified, reissued, or revoked. It is incumbent upon you to remain informed of changes to the NWPs. Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations.

Please contact me via email at Matthew.T.Brody@usace.army.mil, by mail at the address above, or by phone at (907) 790-4493, if you have questions or to request paper copies of the regional and/or general conditions. For more information about the Regulatory Program, please visit our website at http://www.poa.usace.army.mil/Missions/Regulatory.aspx.

Sincerely,

BRODY.MATTHEW.T.1383923111

Digitally signed by BRODY.MATTHEW.T.1383923111
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=BRODY.MATTHEW.T.1383923111
Date: 2015.09.16 14:25:15 -08'00'

Matthew Brody
Regulatory Specialist

Enclosures

CF:

South - Juneau

jackie.timothy@alaska.gov
sero@alaska.gov
oha.revcomp@alaska.gov
james.rypkema@alaska.gov
shannon.dewandel@alaska.gov
FW7_POANotices@fws.gov
john_hudson@fws.gov
hcd.juneau@noaa.gov
AOOARU.R10@epamail.epa.gov
city.clerk@juneau.org
teri.camery@juneau.org
christine.mcnally@juneau.org
dduncan@ccthita.org
klindoff-dia@gci.net
alaiti-dia@gci.net

ENCLOSURE

US Army Corps of Engineers
Alaska District

Permit Number: POA-2014-547

Name of Permittee: Mr. Tim Dudley - SECON

Date of Issuance: September 16, 2015

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to Mr. Matthew Brody at the following address:

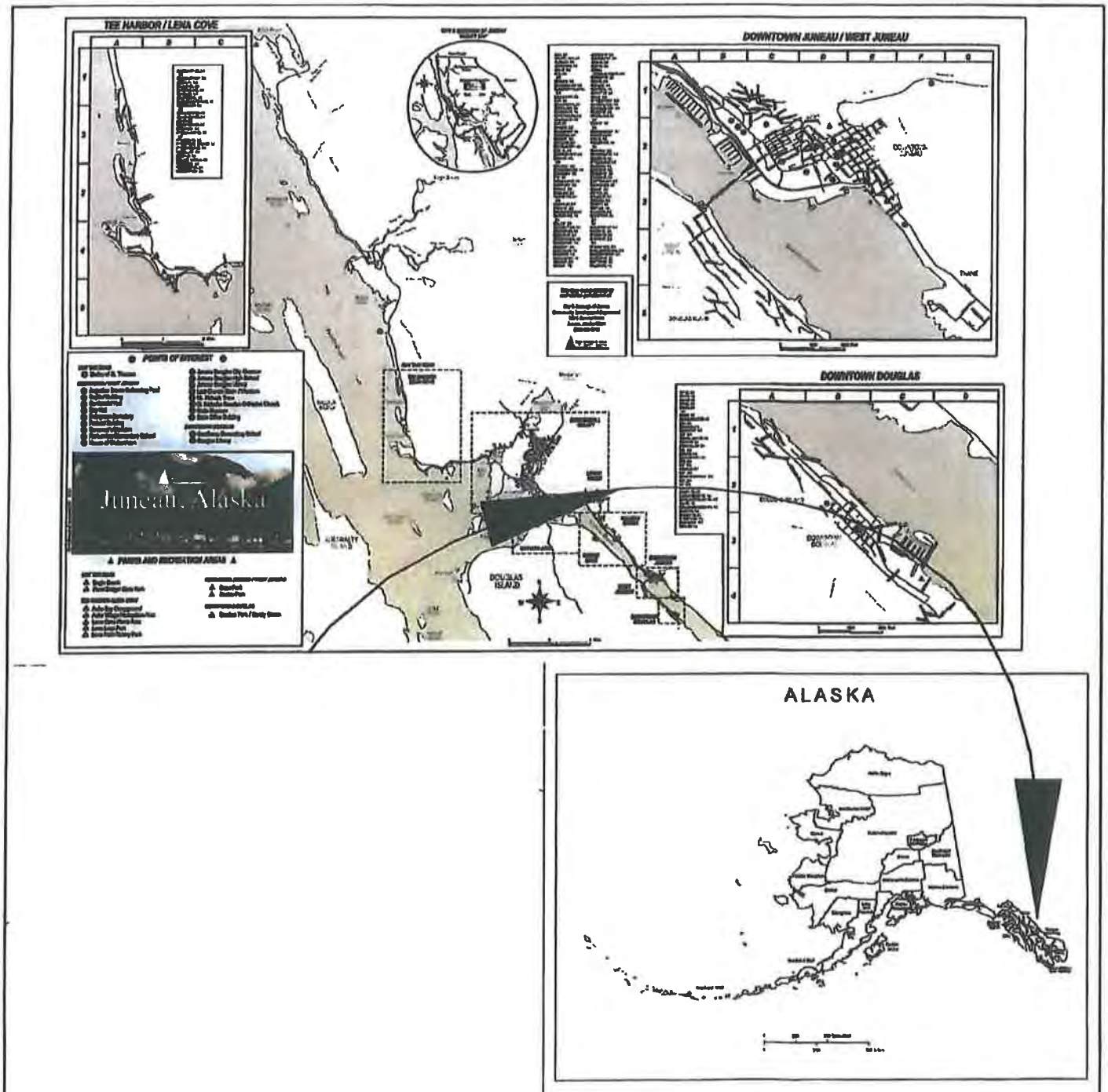
U.S. Army Corps of Engineers
Alaska District
Juneau Regulatory Field Office
P.O. Box 22270
Juneau, Alaska 99802

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above-referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

_____ _____

Signature of Permittee Date

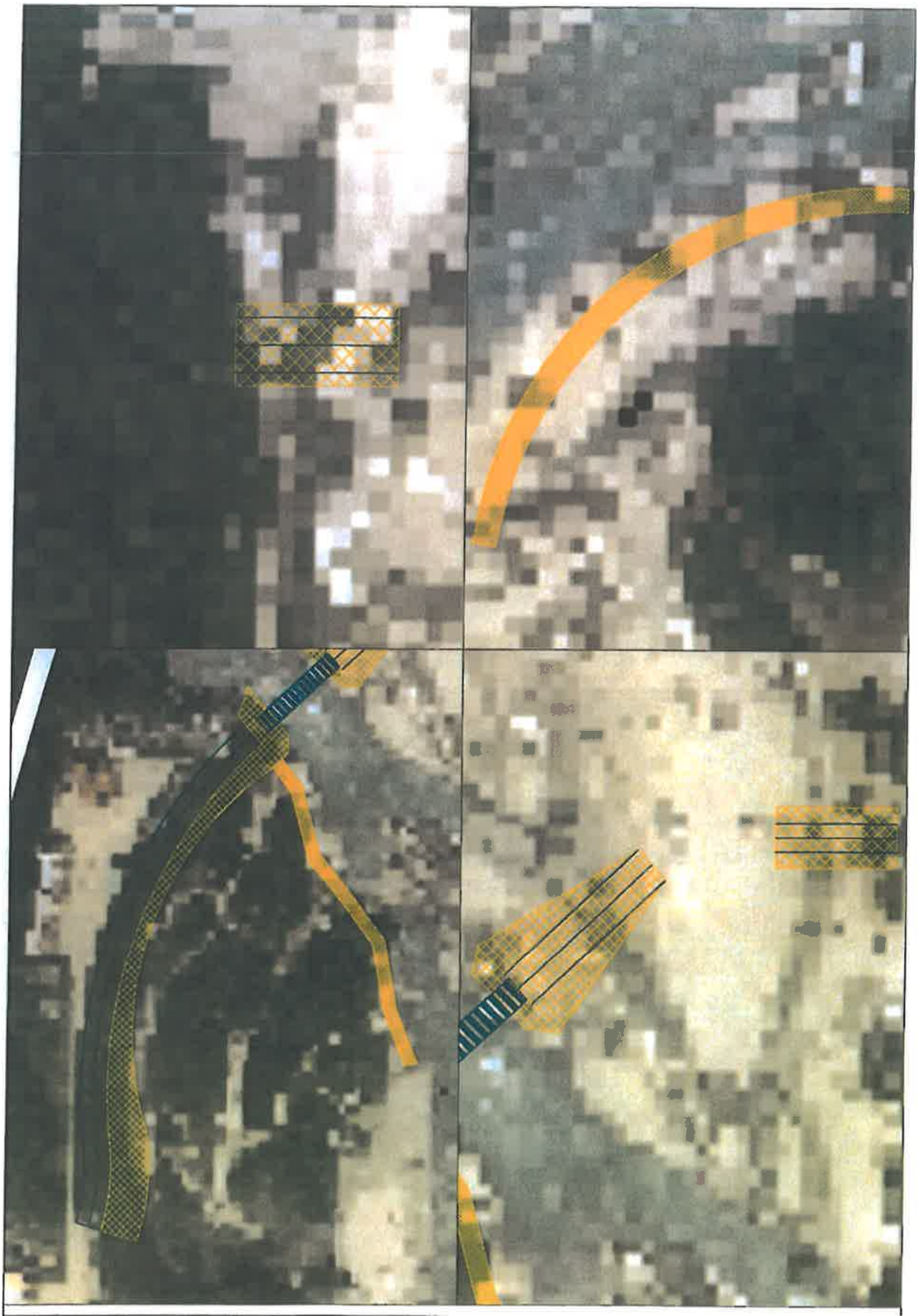


POA-2014-547
August 2015
SECON
Lemon Creek Gravel Extraction
Sheet 1 of 4

Fill Area 21,275 square feet.
Volume 2,800 cubic yards.

SECON
SOUTHEAST ALASKA
P.O. Box 32159
Juneau, AK 99803
(907) 780-5145
1835 Anka Street
Juneau, AK 99801

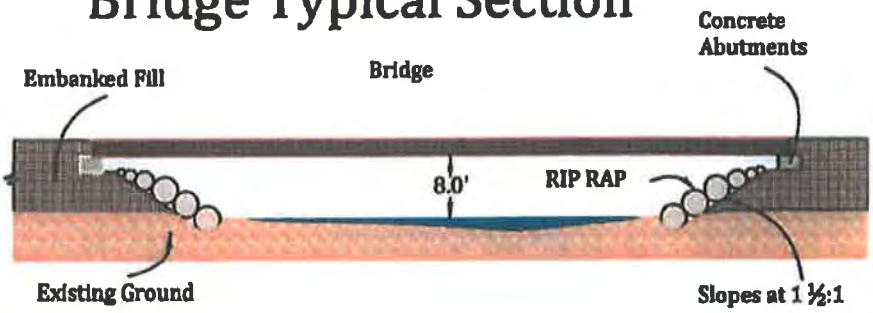
POA-2014-547
August 2015
SECON
Lemon Creek Gravel Extraction
Sheet 2 of 4



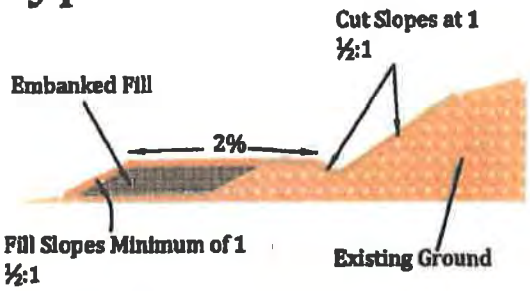
SECON
SOUTHEAST ALASKA
P.O. Box 32159
Juneau, AK 99803
(907) 780-5145
1836 Anka Street
Juneau, AK 99801

POA-2014-547
August 2015
SECON
Lemon Creek Gravel Extraction

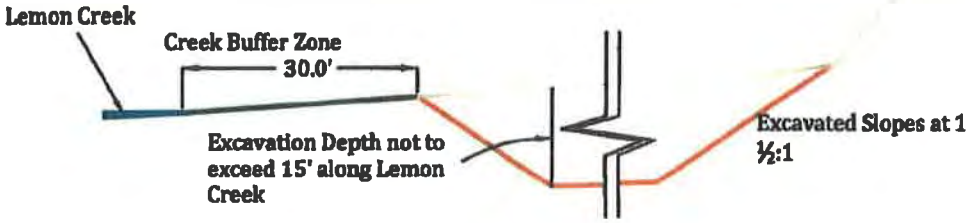
Bridge Typical Section



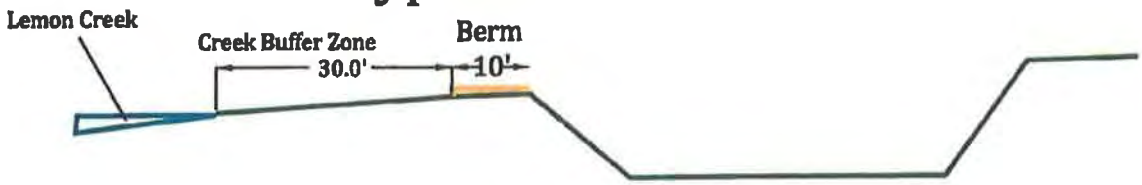
Road Typical Section



Extraction Typical Section



Berm Typical Section



POA-2014-547
August 2015
SECON
Lemon Creek Gravel Extraction
Sheet 4 of 4

MEMORANDUM

State of Alaska

Department of Fish and Game
Division of Habitat

TO: Jackie Timothy
Southeast Regional Supervisor

DATE: September 16, 2015

FILE NO: FH13-I-0057

SUBJECT: Hidden Valley gravel mine trip report September 9, 2015

FROM: Greg Albrecht
Habitat Biologist

PHONE NO: (907) 465-6384

On September 9th I visited Lemon Creek (ADFG Steam no. 111-40-10100; cataloged for chum and coho salmon and Dolly Varden char) adjacent to the SECON owned rock quarry where they plan to extract gravel on two bars (Figure 1). Mike Short (SECON) described their intent to begin at the downstream end of the lower bar and remove 10 to 50,000 cubic yards of material annually, depending on demand. In 2013, Habitat Division issued fish habitat permit FH13-I-0057 for the activity, but work did not occur and the authorization has expired.

I observed the lower gravel bar to be partially vegetated with alder, birch, and spruce trees. The bar is 1300 ft long by 200–450 ft wide, a 7.5 acre area (Figure 1). On my visit, gravel bar banks varied from 0–8 ft above the main channel (Figure 2). Water was springing up in a high flow channel about 200 ft from the downstream end of the bar and I encountered a 40 ft long isolated pond in an alder grove at the upstream end (Figures 3–6).

SECON does not intend to access the upstream gravel bar any time soon as the annual demand of material can be mined from the lower bar. Mining will occur during low water when the ground is not frozen. Temporary berms upstream in dry channels will protect the area in the event of rapid flow rise (Figure 6).

Mike and I agreed that a mine site at the downstream end of the bar in the dry channel could capture bed load during high flow and allow for repeat mining. The excavation would be connected to the main stem and possibly provide habitat for rearing fish. I will reissue FH13-I-0057 for mine operation and work with SECON to stake the mine location prior to extraction and monitor channel changes and fish use after.

Attachment B - ADFG field report

Figure 1.–Area map.

Figure 2.–Looking upstream with the gravel at left.

Figure 3.–Looking downstream from the lower end of the bar where flow emerged in a gravel bar channel.

Figure 4.–Looking upstream at the location where flow emerges in the channel.

Figure 5.–Area map showing possible outline of 1.5 acre mine site (orange), flow emerging in the dry channel (blue dashed), and potential temporary berm sites (red).

Figure 6.–Disconnected pond with no fish visible.

Email cc:

Al Ott, ADF&G Habitat, Fairbanks
ADF&G Habitat Staff, Douglas
Dan Teske, ADF&G/SF, Juneau
Dave Harris, ADF&G/CF, Juneau
Stephanie Sell, ADF&G/WC, Juneau
Cindy Hartmann Moore, NMFS, Juneau
Steve Brockmann, USFWS, Juneau
Linda Speerstra, USACE, Sitka
Teri Camery, CBJ, Juneau
Michael Short, SECON, Juneau

CITY/BOROUGH OF JUNEAU
ALASKA'S CAPITAL CITY

PLANNING COMMISSION
NOTICE OF DECISION
Date: December 19, 2012
File No.: USE2012 0019

Colaska Inc.
PO Box 32159
Juneau, AK 99803

Application For:	A Conditional Use Permit to extract 240,000 cubic yards of gravel from the Lemon Creek streambed over a six year period.
Legal Description:	Mendota Park Parcel 2
Property Address:	Lemon Creek Streambed, No Access
Parcel Code No.:	5-B12-0-131-004-1
Hearing Date:	December 18, 2012

The Planning Commission, at its regular public meeting, adopted the analysis and findings listed in the attached memorandum dated December 6, 2012, and approved the extraction of 210,000 cubic yards of gravel from the Lemon Creek streambed over a six year period to be conducted as described in the project description and project drawings submitted with the application and with the following conditions:

Annual Grading Permit, Bank Protection, and Seismic Monitoring –

1. The operator shall stockpile about 50 cubic yards of broken rap, equivalent to Class I rip-rap, near the project area to address emergencies if the flow becomes redirected towards the bank. If the rock is not used it may be sold when the project ends.
2. Prior to issuance of the first year's grading permit and approval of the first year mining plan, the operator shall submit a bond of $30,000, sufficient to repair any serious bank damage.
3. One month before the commencement of each mining season, the applicant shall submit a mining plan. The mining plan shall be processed by the Engineering Department as an annual grading permit. Such plan shall include:
   a. Estimation of material to be removed
   b. Map of area to be worked (showing property lines)
   c. Map showing proposed culverts, access roads, bank stabilizations, berm details (including height, location, material composition and removal plan) stream relocations and other proposed features
   d. Methods for protecting Lemon Creek from oil, fuel and hydraulic fluid (including leaks from heavy equipment)
   e. Prior to the commencement of mining, the applicant shall verify property line location and delineate offset distance to the extraction area.
4. The top of excavation slopes shall be prohibited within 10' of any banks or the property lines.

Attachement C - USE 2012-00019 Conditions

5. The applicant shall directly hire, or pay permit inspection fees to provide for periodic inspection of the mining area by an appropriately licensed engineer and/or hydrologist.
6. Periodic inspections shall be made as determined by the engineer and/or hydrologist, sufficient to monitor the operation. Such periodic inspections shall include visits during or after high water events.
7. Inspection reports shall be submitted to the Engineering Department for each 10,000 cubic yards of material removed from the stream, and those reports shall include the following information:
    a. Volume of material removed
    b. Map of area worked
    c. Verification of compliance with mining plan
    d. Report of bank destabilizations
    e. Opinion whether bank/property line setbacks are adequately protecting adjacent properties
    f. Bank protection/stabilization measures if merited
8. An inspection report shall be submitted at the end of the mining season which includes all items in numbers 4-7. The report shall be submitted to the Engineering Department and to the Community Development Department within one month of the end of the mining season, or April 15.
9. The applicant/operator shall confine all excavations to within existing rip-rap banks. Prior to proceeding with annual excavations, the applicant must find and stake adjacent rip-rap banks.
10. The applicant/operator shall protect the structural integrity of existing stream banks and rip-rap banks. A no-disturbance zone of at least 10 feet horizontal distance from adjacent rip-rap and banks is required. (This condition is necessary because rip-rap boundaries may or may not correlate with property boundaries, as noted in the earlier requirement to mine 10 feet from property boundaries.)
11. The applicant shall protect all vegetated slopes and maintain a similar non-disturbance zone identified above, unless a site-specific engineering analysis indicates otherwise.
12. All cut-slopes shall be less than 2 horizontal to 1 vertical unless a site-specific engineering analysis proves that a steeper slope protects adjacent properties.
13. Excavated areas within the creek bed must be clearly marked with warning signs. Excavated slopes must be graded to a gentle slope of 4 horizontal to 1 vertical before signs are removed. These measures shall be integrated into the annual grading permit.
14. The approved access points at 1721 Anka Street, 1791 Anka Street, and Ralph's Way shall be inspected each year to verify that no changes have been made to the embankment due to heavy creek flows during the previous year. Alterations to the proposed access will require approval by the Community Development Department and the CBJ Engineering Department.
15. Prior to the issuance of a grading permit, the applicant shall provide a vibration control plan that includes the maximum safe threshold for seismic activity at the nearest adjacent residential structure to the operation, as established by a licensed engineer.
16. During extraction activity, the site shall be monitored by the applicant for seismic activity at the nearest adjacent residential property or at a location agreed upon by the project engineer and adjacent property owners, during each day of operation.
17. The applicant shall submit seismic activity reports at the end of each month of mining activity to the CBJ Engineering Department.

18. If seismic activity exceeds the threshold established in Condition #15, the applicant shall cease operations and notify the CBJ Engineering Department and CBJ Community Development Department. The applicant shall not continue with operations until alternative methods that do not exceed the threshold have been identified by the applicant and approved by CBJ Engineering.

Project Expiration and Dates and Times of Operation -

19. Gravel operations shall take place between December 1 and March 15. No in-water work shall be allowed between March 16 and November 30 with the following exception: In-stream work to connect the excavated sections of the creek shall be allowed for one 7 day period between May 15 and June 15. The applicant shall provide notice to CBJ Engineering and the Alaska Department of Fish and Game before work commences.
20. Operating hours shall be 7 a.m. to 6 p.m. on weekdays, and 9 a.m. to 6 p.m. on Saturdays. Operations shall not be allowed on Sundays.
21. Gravel extraction shall be limited to 40 days per year.
22. The permit shall expire after six years or extraction of 210,000 cubic yards of gravel, whichever comes first.
23. The extraction amount shall not exceed 35,000 cubic yards per year.

Truck Traffic and Street Maintenance -

24. Truck traffic from the development shall be routed only through the Anka Street/Glacier Highway intersection.
25. Truck traffic and heavy equipment operation associated with gravel extraction is strictly prohibited from the Davis Avenue side of the river.
26. Prior to leaving the excavation area, the transport truck bed, with the tailgate locked, shall be raised to a minimum twenty degree angle for a timed 5 minutes to allow excess water to escape. Tilt time may be reduced if water escapement occurs sooner based on the project engineer's visual assessment and approval.
27. The applicant shall protect catch basins along the route from sediment infiltration by use of manufactured Catch Basin filters.
28. The applicant shall inspect the traveled route a minimum of twice daily for escaped material from the haul.
29. The applicant shall sweep and clean the roadway at the end of each day if any water or material has escaped, or if a major spill occurs.
30. The applicant shall immediately respond to any additional clean-up requests during the operation from the project engineer, CBJ or ADOT.
31. The applicant shall construct a rockery lane for debris removal from truck tires prior to entering Anka Street.

Habitat Protection -

32. No sediment migration from the truck or ramp shall be allowed in the waterway.
33. Prior to commencement of mining and prior to gravel bar coverage with snow and ice, the applicant shall field stake the exact excavation configuration and setbacks from flowing water.
34. The applicant shall place any large woody debris encountered during excavation activities at the surface of the floodplain, upstream or adjacent to the excavation area to encourage gravel bar formation and/or side channel creation. The woody material shall be partially buried to anchor the material during high flows.
35. There shall be no on-site fueling or equipment maintenance performed within 100 feet of the creek banks. This includes fueling or maintenance of portable equipment such as generators and pumps.
36. There shall be no on-site storage of fuel or other chemicals.

Attachments: December 6 2012, memorandum from Teri Camery, Community Development, to the CBJ Planning Commission regarding USE2012 0019.

This Notice of Decision does not authorize construction activity. Prior to starting any project, it is the applicant's responsibility to obtain the required building permits.

This Notice of Decision constitutes a final decision of the CBJ Planning Commission. Appeals must be brought to the CBJ Assembly in accordance with CBJ §01.50.030. Appeals must be filed by 4:30 P.M. on the day twenty days from the date the decision is filed with the City Clerk, pursuant to CBJ §01.50.030 (c). Any action by the applicant in reliance on the decision of the Planning Commission shall be at the risk that the decision may be reversed on appeal (CBJ §49.20.120).

Effective Date: The permit is effective upon approval by the Commission, December 18, 2012.

Expiration Date: The permit will expire 18 months after the effective date, or June 18 2014, if no Building Permit has been issued and substantial construction progress has not been made in accordance with the plans for which the development permit was authorized. Application for permit extension must be submitted thirty days prior to the expiration date.

Project Planner:

Greg Chaney for Teri Camery, Planner
Community Development Department

Denni Watson for Michael Satre, Chair
Planning Commission

Laurie J. Sica
Filed With City Clerk

12/20/12
Date

cc: Plan Review

NOTE: The Americans with Disabilities Act (ADA) is a federal civil rights law that may affect this development project. ADA regulations have access requirements above and beyond CBJ-adopted regulations. Owners and designers are responsible for compliance with ADA. Contact an ADA - trained architect or other ADA trained personnel with questions about the ADA: Department of Justice (202) 272-5434, or fax (202) 272-5447, NW Disability Business Technical Center (800) 949-4232, or fax (360) 438-3208.

Southeast Alaska Land Trust

Organization,
In-Lieu Fee Program,
&
CIAP Grant Project

Allison Gillum

March 12, 2016

Southeast Alaska Land Trust

Stewarding Lands You Cherish

- Founded in 1995
- Private, 501(c)3 non-profit organization
- 1 of 7 land trusts in Alaska

Southeast Alaska Land Trust

Stewarding Lands You Cherish

MISSION STATEMENT

The Southeast Alaska Land Trust cooperates with communities, landowners, agencies, and others to ensure that habitat, recreation, open space, and historic areas remain in place for the well-being of each generation.

Southeast Alaska Land Trust

Stewarding Lands You Cherish

- Protects 30 properties totaling nearly 3,500 acres:
  - 15 conservation easements
  - 14 fee-simple title
  - 1 deed restriction

Southeast Alaska Land Trust

Stewarding Lands You Cherish

- Properties located in:
  - Juneau
  - Excursion Inlet
  - Sitka
  - Kake
  - Haines
  - Farragut Bay

Southeast Alaska Land Trust

Stewarding Lands You Cherish

- Follows national standards & practices for conservation property acquisition and long-term stewardship

- Annually monitors properties & is prepared to take action if needed

Jensen-Olson Arboretum, Juneau

Jensen-Olson Arboretum, Juneau

SEAL Trust In-Lieu Fee Program

SEAL Trust In-Lieu Fee Program

- 1998 - Original agreement between SEAL Trust and U.S. Army Corps of Engineers (Corps)
- 2011 - Revised In-Lieu Fee “Instrument”
- Since 2002, about 640 acres protected with ILF monies

How ILF Program Works

- SEAL Trust has pool of advance wetland “credits”

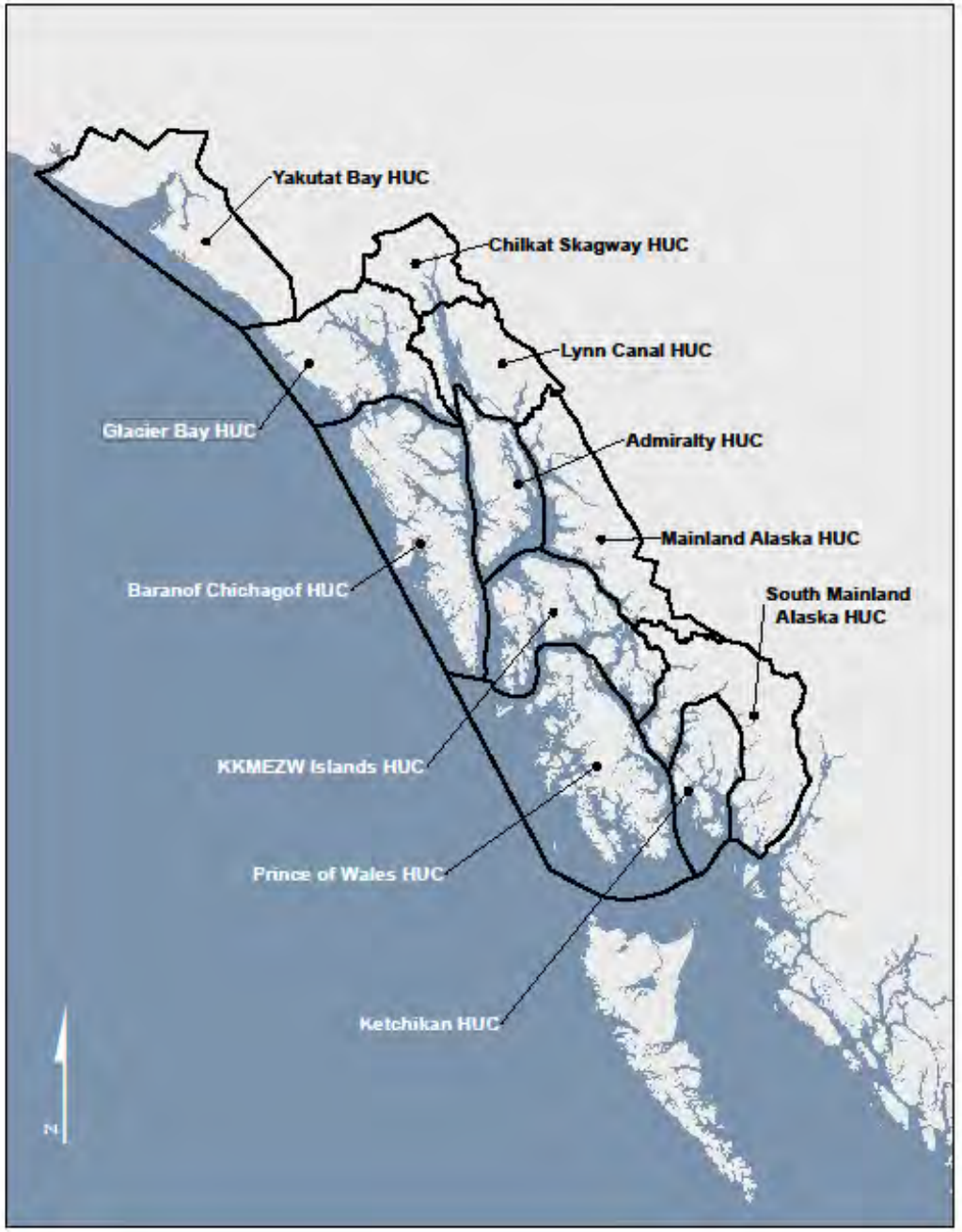
- Upon request, SEAL Trust calculates an ILF estimate (land, real estate, stewardship, admin costs) for mitigation required in a Corps permit

How ILF Program Works

- If ILF payment is made, SEAL Trust assumes the permittee's mitigation obligation as wetland "debits"
- SEAL Trust acquires conservation property with wetland attributes (Corps/IRT approval)
- "Recycles" debits back to pool of advance credits

How ILF Program Works

- Permittees: individuals, cities, non-profits, State DOT, FHA, USFS, University, tribal associations, mining & seafood companies


Yakutat Bay HUC
Chilkat Skagway HUC
Lynn Canal HUC
Glacier Bay HUC
Admiralty HUC
Mainland Alaska HUC
Baranof Chichagof HUC
South Mainland Alaska HUC
KKMEZW Islands HUC
Prince of Wales HUC
Ketchikan HUC
N

How Does SEAL Trust Select Properties?

- Willing Landowners
- Mitigation sites located in same HUC as wetland impacts
- High functioning wetland habitats

Crescent Bay (Sitka) ILF Mitigation Project

Farragut Estuary ILF Mitigation Project

Mud Bay (Haines) ILF Mitigation Project

SEAL Trust’s CIAP Grant Project

SEAL Trust's CIAP Grant Project

- Revised In-Lieu Fee "Instrument" in 2011 highlighted the need for a regionally-specific, consistent, and science-based method to evaluate the ecological functions and values of wetland sites

SEAL Trust's CIAP Grant Project

- 2010 – Evaluation of rapid wetland assessment methods

- Wetland Ecosystem Services Protocol-US (WESPUS) was selected to be adapted to Southeast Alaska

SEAL Trust's CIAP Grant Project

- 2011 - WESPAK-SE protocol was initially calibrated with 32 Southeast Alaska wetland sites

- 2012 - SEAL Trust hosted first classroom training and field-based trials of the WESPAK-SE

SEAL Trust's CIAP Grant Project

- 2013 – SEAL Trust awarded CIAP Grant (2013-2016)
- Project Title: "Coastal Wetlands Protection in Southeast Alaska"
- Tasks included building on WESPAK-SE "beta version" field tested in 2012

SEAL Trust's CIAP Grant Project

- 2013 to 2014 – statistically selected tidal wetlands (55 sites) and non-tidal wetlands (119 sites) were assessed to:
  - refine the protocol
  - provide a relative context for interpreting the WESPAK-SE scores

SEAL Trust's CIAP Grant Project

- Further, in 2013 CBJ contracted the WESPAK-SE developer for further tool development
- Included peer review workshops where input from local subject matter experts was solicited specific to variables used in the assessment methodology
- In 2014 and 2015 the CBJ assessed 360 assessment areas with the updated protocol

SEAL Trust's CIAP Grant Project

- Tidal Wetlands:
  - 7 variables called "function" scores
  - 7 variables called "value" scores
- Non-Tidal Wetlands:
  - 18 function scores
  - 19 value scores

SEAL Trust's CIAP Grant Project

- In general, WESPAK-SE is intended to provide agencies, non-governmental organizations, and the development community a consistent tool for evaluating the functions and values of wetland sites for:
  - Landscape assessment
  - Impact analysis
  - Mitigation planning
  - Conservation actions

SEAL Trust's CIAP Grant Project

- WESPAK-SE is intended to help address the national policy goal of "no net loss"

- Goal pertains not only to wetland acreage but also to the ecosystem services that wetlands provide naturally

SEAL Trust's CIAP Grant Project

- SEAL Trust's other tasks under CIAP Grant:
  - Intertidal/Nearshore Assessment Tool (NATAK-SE)
  - Credit-Debit Method
    - To balance wetland "credits" gained from mitigation sites to compensate for wetlands lost at impact sites "debits"

Southeast Alaska Land Trust

Stewarding Lands You Cherish

119 Seward Street, Suite 2

Juneau, AK 99801

Phone: 907-586-3100

Email: allison@setrust.net

Website: www.southeastalaskalandtrust.org

Executive Director: Allison Gillum

How the WESPAK-SE Tool Was Used to Assess Juneau Wetland Functions and Their Context

Workshop Presentation, 12 March 2016
to the Wetlands Review Board, Juneau, AK

Dr. Paul Adamus

Funded by the Coastal Impact Assistance Program, U.S. Fish & Wildlife Service, through the Alaska Department of Commerce, Community, and Economic Development, Grant #10-CIAP-0009, "Habitat Mapping and Analysis Project"

DETAILED AGENDA

WESPAK-SE history, general structure
Why standardize? Repeatability.

Definitions of functions
Functions vs. Values
Indicators used
UAS web site

How the spreadsheet calculates scores
How scores are normalized
How the normalized scores convert to ratings

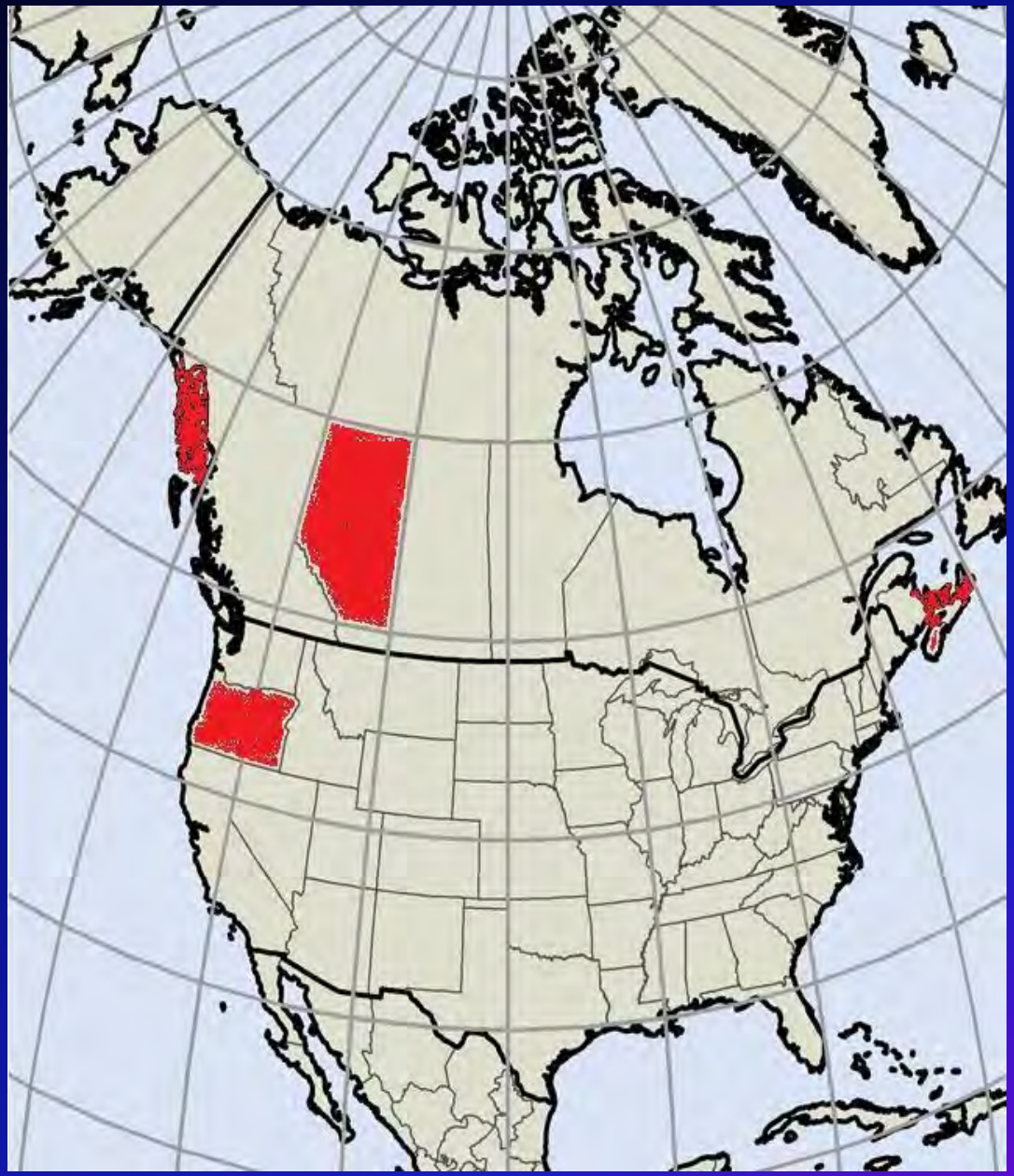
Virtual tour of highest- and lowest-scoring wetlands

How to trace *which* wetland features most responsible for a high or low score.

Limitations. Watershed approach.

Description of each function and value model.

(afternoon): Some options for score roll-ups.

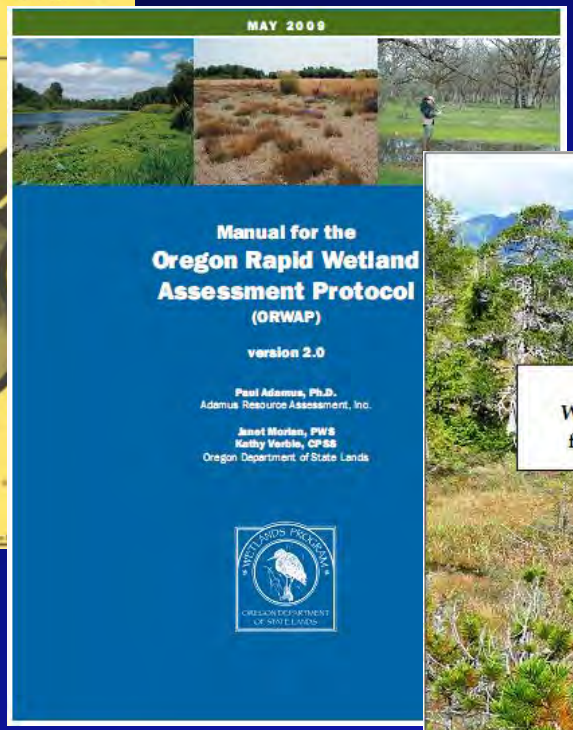


WET/ WESP regionalizations

United States

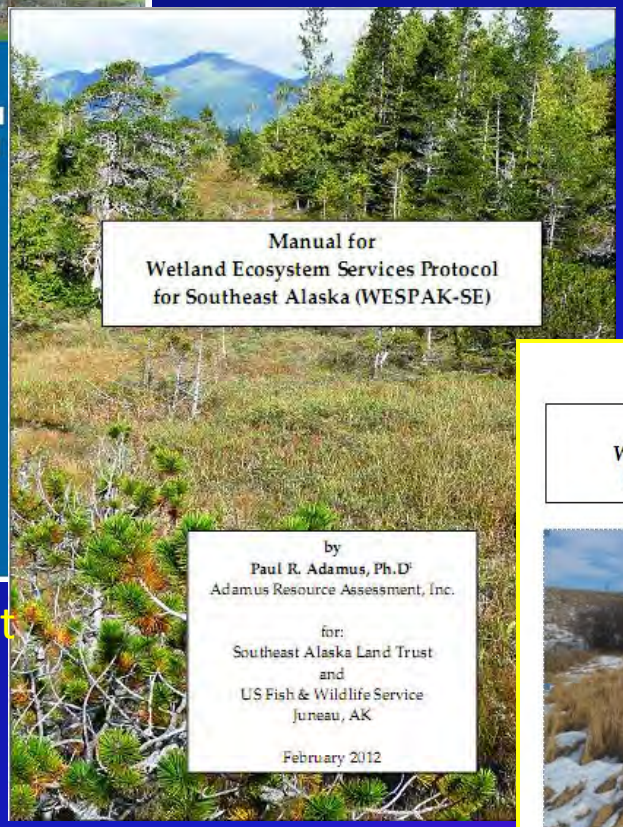
1983, 1987

Oregon



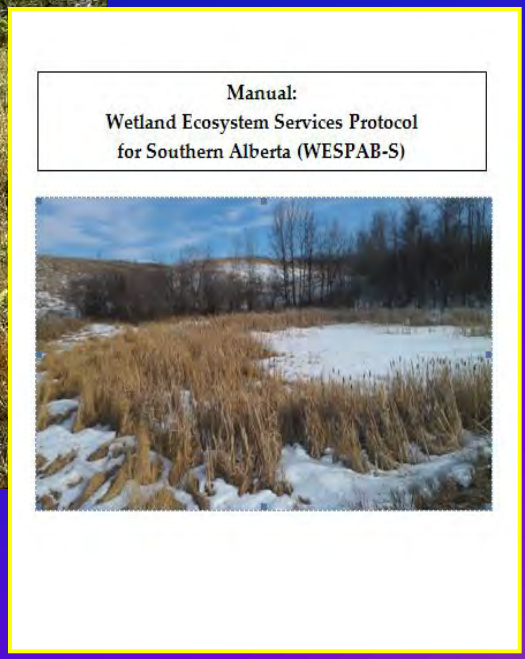
2009-present

Alaska Southeast



2011-present

Alberta (3 regions)

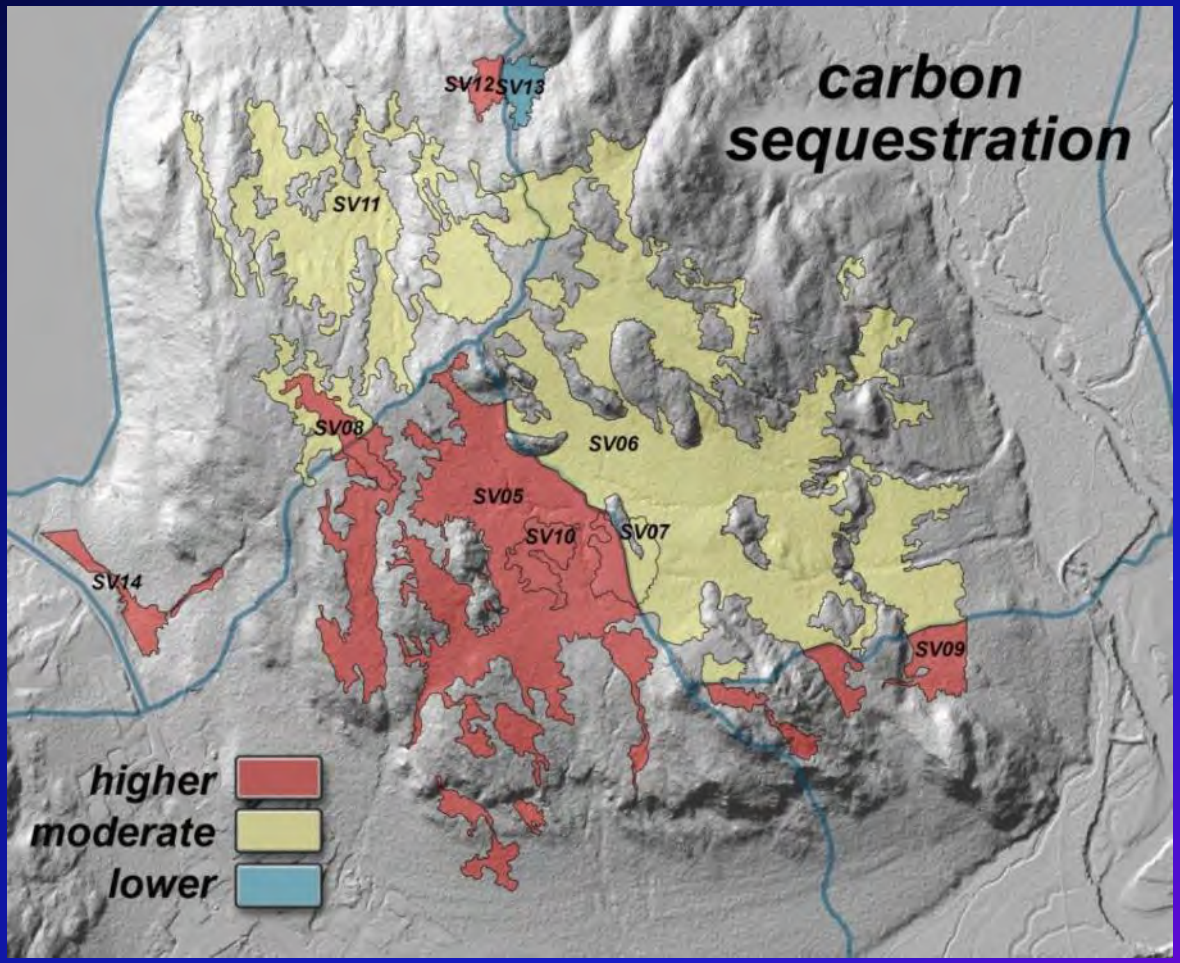


2012-

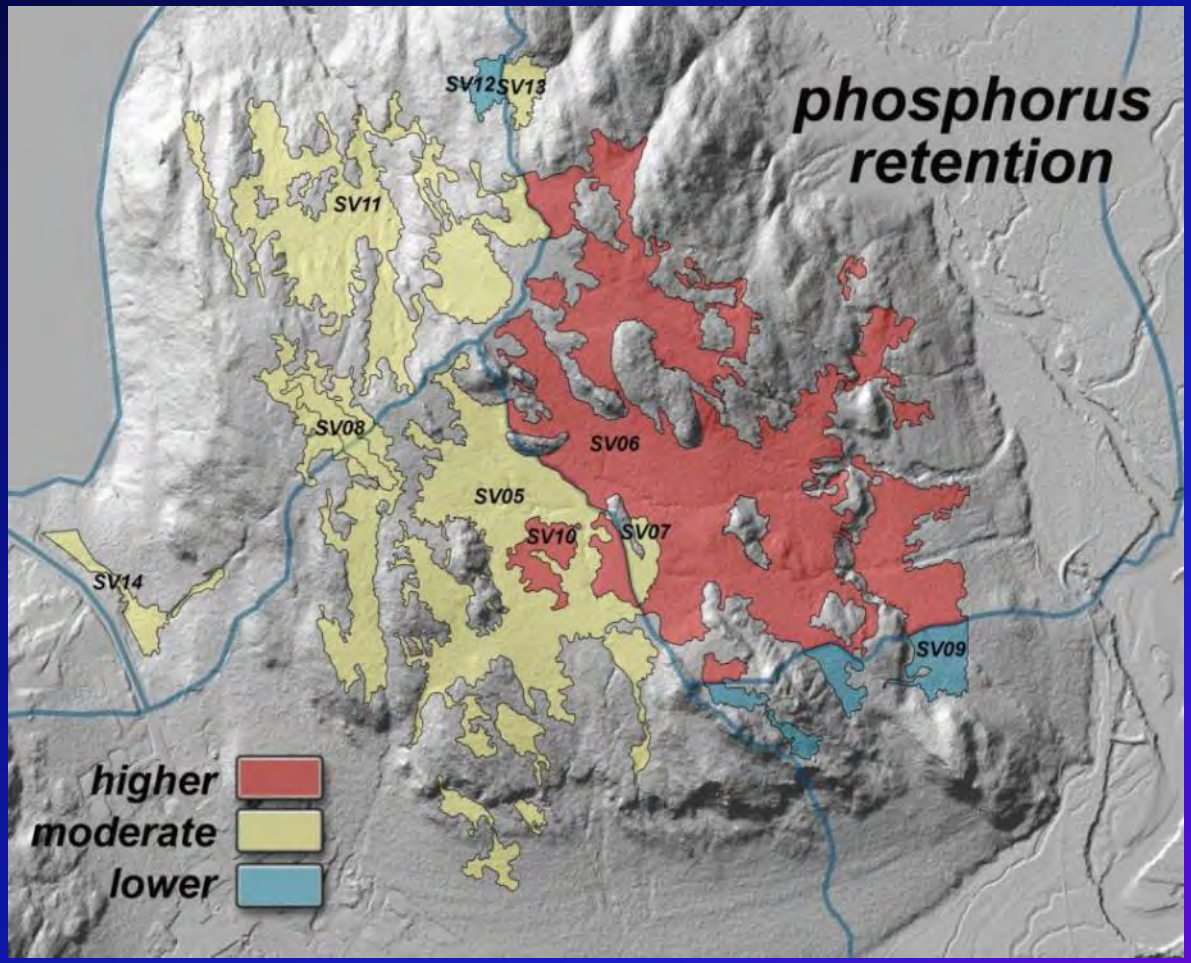
What the WESPAK-SE output looks like:

Site:		ER71		ER02		ER09		ER08	
Group	Function	Score	Rating	Score	Rating	Score	Rating	Score	Rating
1	Anadromous Fish Habitat	**10.00**	H	4.28	M	0.00	L	**8.44**	H
	Resident Fish Habitat	8.60	H	7.09	M	6.61	M	7.48	H
2	Carbon Sequestration	2.65	L	6.87	H	**7.09**	H	2.83	L
	Nitrate Removal	4.84	H	2.12	M	1.84	L	3.11	M
	Phosphorus Retention	3.78	M	3.83	M	4.20	H	3.55	M
	Sediment Retention & Stabilization	3.81	M	2.59	M	6.22	H	4.88	H
3	Invertebrate Habitat	6.22	H	2.75	L	1.88	L	2.23	L
	Organic Nutrient Export	7.32	M	5.35	L	4.51	L	6.57	M
	Stream Flow Support	2.57	L	0.42	L	0.50	L	4.29	M
	Water Cooling	4.85	M	4.28	M	4.60	M	7.51	H
	Water Warming	4.12	M	2.94	M	0.00	L	1.26	L
4	Water Storage	3.98	M	5.96	H	2.56	L	5.90	H
5	Amphibian Habitat	1.55	L	4.04	M	4.36	M	2.90	M
	Waterbird Feeding Habitat	8.07	H	6.33	H	6.71	H	0.00	L
	Waterbird Nesting Habitat	5.61	M	3.86	M	0.00	L	3.98	M
6	Songbird, Raptor, & Mammal Habitat	4.76	M	**7.30**	H	5.19	M	7.53	H
	Native Plant Habitat	4.85	M	4.55	M	3.23	M	5.86	H
	Pollinator Habitat	2.31	L	4.97	M	1.77	L	3.09	L

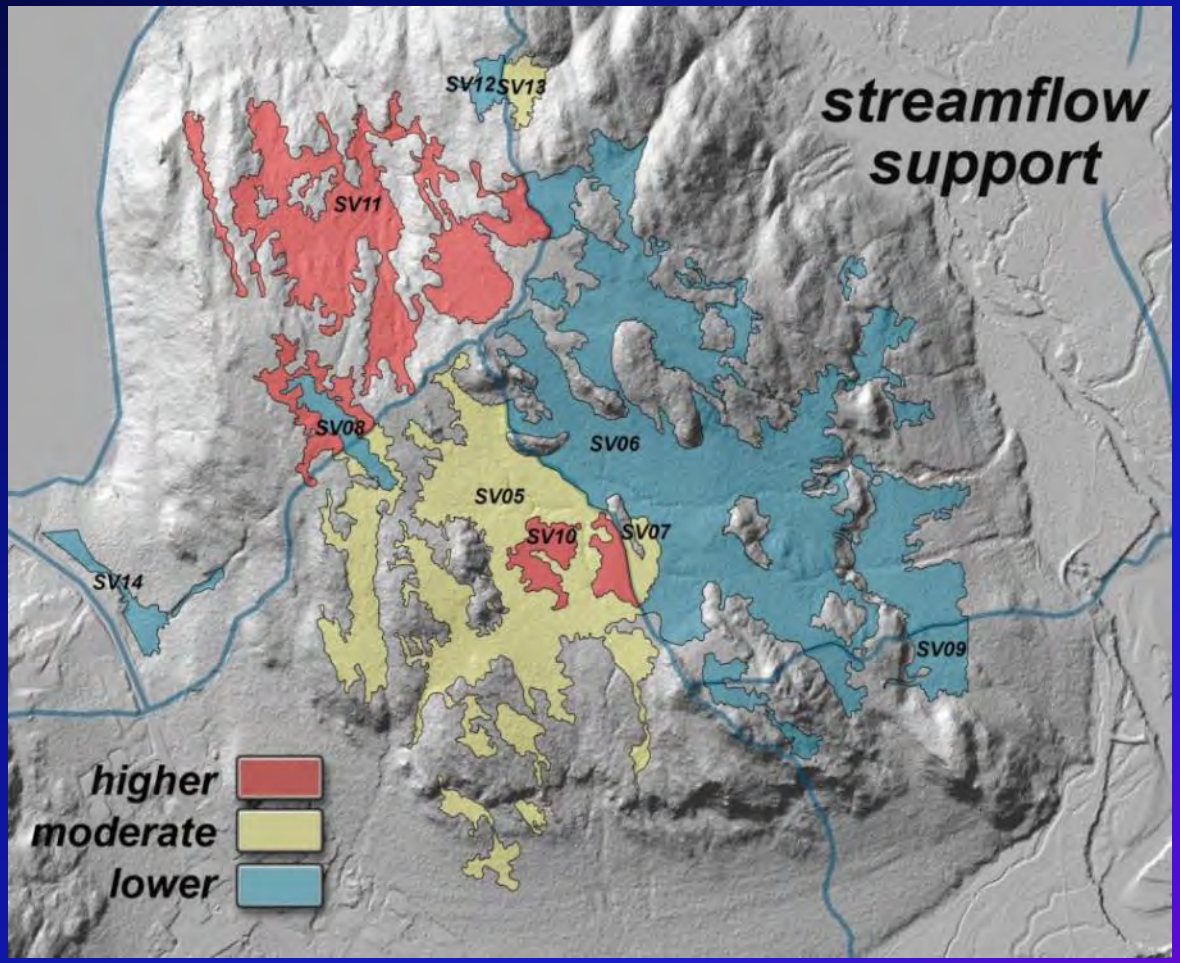
Different Wetlands are Important for Different Things



Different Wetlands are Important for Different Things



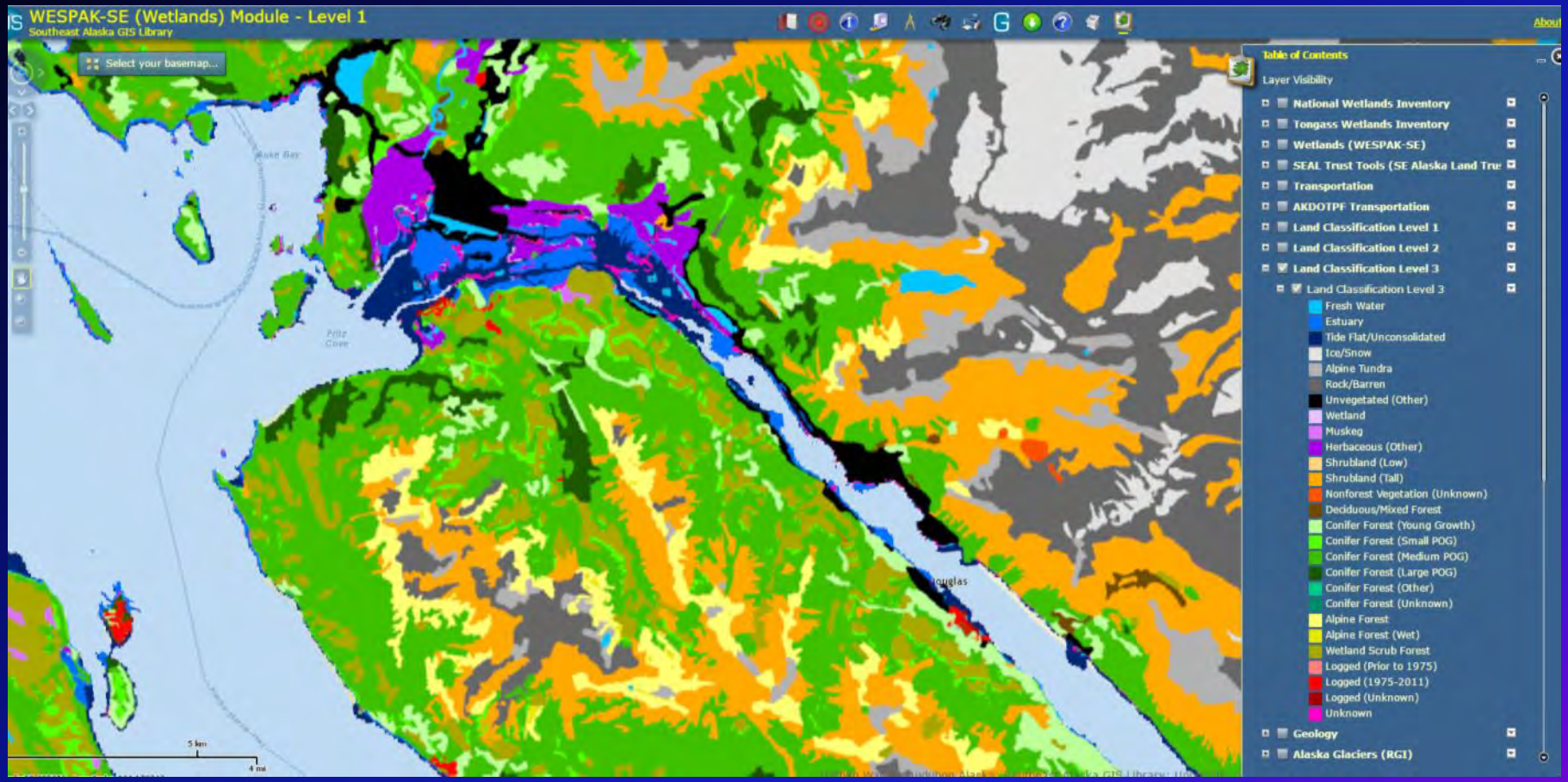
Different Wetlands are Important for Different Things



"Office" Indicators

Distance by Road to Nearest Population Center	Drinking Water Source
Wildlife Access to Other Wetlands	Elevation in Multi-scale Watersheds
Distance to Nearest Maintained Road	Wetland Class Scarcity in HUC6
Distance to Natural Land Cover	Contributing Area (CA) Percent
Size of Largest Nearby Tract or Corridor of Natural Land Cover	Unvegetated Surface in the Contributing Area
Natural Land Cover Extent	Transport From Upslope
Type of Land Cover Alteration	Aspect
Wetland Local Uniqueness	Internal Gradient
Distance to Locally Uncommon Cover Type	Internal Flow Distance (Path Length)
Ponded Water in Landscape	Relative Hydrologic Distance to Anadromous Stream
Ponded Water Proximity	Salmonid Watershed
Distance to Lake	Subsistence Focal Areas
Tidal Proximity	Geography
Upland Edge Contact	Unbrowsed Vegetation
Floodable Property	Amphibian Use
Glacier Fed	Nesting Waterbird Species of Conservation Concern
Fish Access or Use	Non-breeding Waterbird Species of Conservation Concern
Designated IBA	Songbird or Raptor Species of Conservation Concern
Deer Winter Habitat Capability	Plants of Conservation Concern
Precipitation, Mean Annual	Cedar
Temperature, Mean Annual	Mitigation Investment
Basic pH or Karst	Conservation Investment
Granitic Soils	Sustained Scientific Use
Upslope Soil Erodibility & Debris Flow Potential	
Toxicity Documented Upstream	
Toxicity Documented Downstream	

http://seakgis.alaska.edu/flex/wetlands/



On-site (Field) Indicators

Wetland Type	Throughflow Complexity	Herbaceous Species Dominance
% of Wetland That Is Saturated Only	Outflow Duration	Invasive & Non-native Cover
% with Persistent Surface Water	Outflow Confinement	Weed Source Along Upland Edge
Summertime Shading of Water	Groundwater: Strength of Evidence	Natural Cover in Buffer
Fringe Wetland	Woody Cover Extent	Type of Cover in Buffer
Lacustrine Wetland	Tree & Tall Shrub Canopy Extent	Slope from Disturbed Lands
% Flooded Only Seasonally	Deciduous Trees	Cliffs, Banks, Beaver, Muskrat
Annual Water Fluctuation Range	Woody Diameter Classes	New Wetland
Predominant Depth Class	Snags	Visibility
Depth Class Distribution	Downed Wood	Ownership
Open Water - Extent	Exposed Shrub Canopy	Non-consumptive Uses
Flat Shoreline Extent	Shrub Species Dominance	Core Area 1
Width of AA's Vegetated Zone	Woody-Herbaceous Interspersion	Core Area 2
Non-vegetated Aquatic Cover	Deciduous Shrubs	BMP - Soils
All Ponded Water - Extent	N Fixers	BMP - Wildlife Protection
Open Ponded Water - Extent	Moss Extent	Consumptive Uses
Emergent Vegetation - Distribution	Bare Ground & Accumulated Plant Litter	Domestic Wells
Floating Algae & Duckweed	Ground Irregularity	STRESSOR QUESTIONS:
Ice Cover	Upland Inclusions	Wetter Water Regime
Stained Surface Water	Soil Texture	Drier Water Regime
Isolated Island	Shorebird Feeding Habitats	Altered Timing of Water Inputs
Beaver	Largest Herbaceous Patch	Contamination Potential: Toxics
Flowing Water - Extent	Unshaded Herbaceous Extent	Contamination Potential: Nutrients
Inflow	Forb Cover	Contamination Potential: Sediment
Input Water Temperature	Sedge Cover	Soil or Sediment Alteration
Input Stream Gradient		

Example of a WESPAK-SE question:

Distance to Lake	The distance from the AA edge to the closest (but separate) **lake** (a non-tidal body of water that is ponded during most of the year and is **larger than 20 acres** or about 1000 ft on a side) is:	
	<1 mile	0
	1-5 miles	1
	>5 miles and on the mainland or the same island	0
	>5 miles and on a different island	0

WRB Questions:

Office Form question 42, 43, 44: Some of the birds here are not on the Audubon watch list for Alaska; half of them don't nest here. Please explain.

Andres & Browne (Yakutat):

Red-throated Loon, Osprey, Peregrine (probable)

Piston & Heinl (Ketchikan):

Lesser Yellowlegs, Solitary Sandpiper (probable)

Office Form question 41 on amphibians: has a species (northwestern salamander) found in only two locations in Southeast Alaska.

Field question #45, nitrogen fixers: this lists clover, which is an invasive species. Could this be part of the invasive species list instead? Please explain.

The spreadsheet structure. [calculator file]

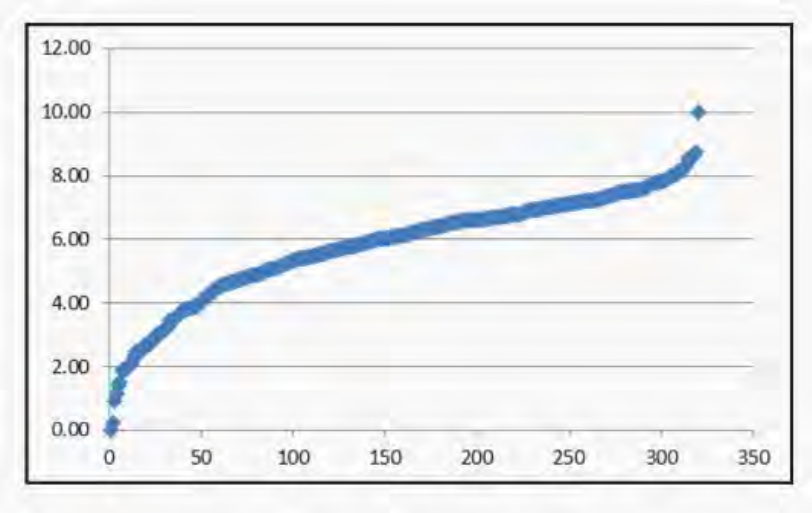
How the spreadsheet calculates scores

How scores are normalized [normalization file]

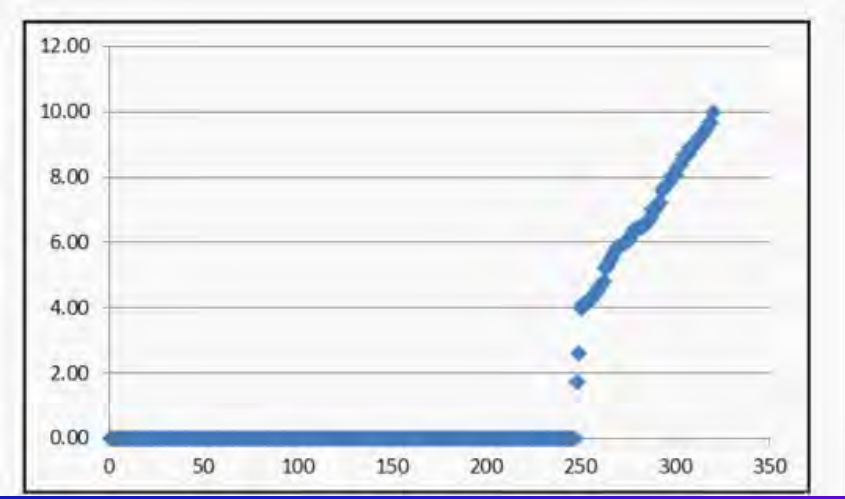
How the normalized scores convert to ratings [Jenks, histograms]

WESPAK-SE Score Distributions Varied by Function

Carbon Sequestration



Anadromous Fish



Limitations of the Study

- Boundary determinations, not official delineations.
- One-time visit to each wetland.
- Variation within wetlands. Defining rare "types".
- Use of some secondary data sources.
- Scores are not "real" **measures** of functions: indicators, hypotheses.
- Were normalized only to the studied wetlands, not to all Juneau or Southeast Alaska wetlands.
- Expiration dates.
- Nobody fully understands what drives a wetland's functions.
- Score distributions of different functions differ.
- Modifying data inputs would require re-doing entire study.
- Modifying models now would require recomputing all scores and would deviate from the WESPAK-SE version being used elsewhere in the region.

Virtual tour of highest- and lowest-scoring wetlands

How to trace *which* wetland features most responsible for a high or low score.

	Highest Function Scores			Lowest Function Scores		
Surface Water Storage (WS)	AB13, LC05, ER61, ER62			ND56	SV30	ND66
Stream Flow Support (SFS)	EC10	EC37	WJ14	AB13	LC05	ND67
Streamwater Cooling (WC)	ER05	LC04	LC08	many = 0		
	and 5 more (all tied)					
Streamwater Warming (WW)	WD70	WD68	EC37	many = 0		
Sediment & Retention & Stabilization (SR)	AB13	ER61	ER62	EC22	ND65	WD65
Phosphorus Retention (PR)	AB13	ER50	ER37	SV22	EC51	WD53
Nitrate Removal & Retention (NR)	AB13	LC05	NV06	ND65	NV09	AB06
Carbon Sequestration (CS)	AB13	ER61	AB11	EC48	WD68	EC37
Organic Nutrient Export (OE)	WD67	WD66	EC08	AB13	LC05	
Anadromous Fish Habitat (FA)	ER71	ER55	EC06	many = 0		
Resident & Other Fish Habitat (FR)	EC48	EC06	WD07	many = 0		
Aquatic Invertebrate Habitat (INV)	NV29	EC06	EC11	ER33	ND27	ND20
Amphibian Habitat (AM)	EC28	ER55	ER35	NV09	NV36	NV29
Waterbird Feeding Habitat (WBF)	EC48	ER55	EC06	many = 0		
Waterbird Nesting Habitat (WBN)	EC06	EC48	EC28	many = 0		
Songbird, Raptor, & Mammal Habitat (SBM)	ER22	EC08	AB02	SV45	WD13	WD68
				and 7 more (all tied)		
Pollinator Habitat (POL)	ER37	ER50	SV01	ER12	WD68	ER10
Native Plant Habitat (PH)	WD06	ER07	WD05	WD64	WD61	WD56
Public Use & Recognition (PU)	ND10	LC04	ER33	EC11	EC13	EC14

WESPAK-SE model for **Surface Water Storage**

Subsurface	0.00	AVERAGE(SoilTex, Groundw)
Freezing	0.25	AVERAGE(Freeze, Elev, Warmth,TidalProx, Aspect)
Live Store	0.00	IF((AllSat=1),0, AVERAGE(Fluctua,SeasPct))
Friction	0.06	IF((AllSat=1),(3*Gradient +AVERAGE(Gcover,Girreg))/4, **ELSE**: AVERAGE(OutDura,Gradient, AVERAGE(Constric,ThruFlo,PondWpctWet))

Function Model

IF((NoOutlet=1), 1,
IF((AllSat=1), AVERAGE(Gradient, Subsurface,
AVERAGE(Freezing, Friction)),
ELSE: (4*LiveStore + 2*Friction + Subsurf)/7))

Context of the Function:

IF((FloodBdg=1, 1, **ELSE**: AVERAGE:
[average (CAunveg, Glacier, ShedPos,CApct),Transport)]

WESPAK-SE model for **Stream Flow Support (SFS)**

Connectivity	0.00	OutDur
Climate	0.00	AVERAGE(IceDur, Aspect, Depth,Soil)
Groundwater Input	0.00	AVERAGE(Groundw,Wettype)

Function Model:
OutDur * { [(2*GroundwaterInput) + ClimateFactors)] / 3 }

Value of the Function:
average (InvScore, AnadScore, ResFishScore, Glacier, Elev)

Sediment Retention

Live Store	0.00	IF(AllSat=1),"", AVERAGE(Fluctua,SeasPct)
Entrain	0.00	IF(AllSat=1),"", AVERAGE(OutDura,FlowDist,Depth, IsoWet, WatEdgeSlope)
Dry Intercept	0.00	AVERAGE[Gradient, AVERAGE(Girreg,Gcover, WetPctCA2)]
Wet Intercept	0.00	IF(AllSat=1),"", IF(NoPonded=1),"", ELSE: AVERAGE (Width, AVERAGE(Thruflo,AqPlantCov, Interspers))
Frozen	0.33	AVERAGE(Freeze, Elev,GDD,TidalProx)

Function:
IF((AllSat=1), DryIntercept, IF((NoOutlet=1),1, ELSE: (2*AVERAGE(Entrain, LiveStore) + AVERAGE(DryIntercept, WetIntercept, Frozen))/3))

Value of the Function:
MAX(ToxData, ToxUp, AVERAGE(Inflo,SatPct,FlowIn,Glacier, AVERAGE(ImpervPctSS,ErodibleSS,SedIn, CAnatPct, BuffSlope,Elev,CApct,TransportSS,MaxFluc,NewWeta)

Phosphorus Retention

Frozen Duration	0.33	AVERAGE(Freeze, Elev,GDD,TidalProx)
Intercept Dry	0.00	AVERAGE(Gradient, FlowDist, AVERAGE(Girreg, Gcover,CApctB))
Intercept Wet	0.00	IF(AllSat=1),"", IF(NoPonded=1),"", AVERAGE (Width, MAX(Thruflo,AqPlantCov, Interspers))
Connectivity	0.00	AVERAGE(OutDur,Constric,Gradient, FlowDist,Lake)
Adsorption	0.00	AVERAGE(SoilTex, Stain)
Desorption	0.00	AVERAGE(SatPct, Persis, DomDepth, Fluctu)

Function:
IF((AllSat=1),AVERAGE(IntercepDry, Adsorb,FreezeDura), IF((NoOut=1),1, ELSE: (3*AVERAGE(Adsorption, Desorption) + 2*Connectivity+ (AVERAGE(InterceptWet, interceptDry) + FreezeDuration) / 7

Value of the Function:
MAX(Pload,AVERAGE((Inflo,StreamIn Grad, Glacier, AVERAGE(BuffSlope,ErodScore,PosShed, NewWet,CApct,Transport, Anad, Groundw, ImpervCA,NatCApct))

Carbon Sequestration

Historical Accum	0.00	IF((NotNewWet=1), AVERAGE(SoilDisturb,MossCov, Wettype, SoilTex, AVERAGE(Warmth,DecidPct, DecidTree,Width), **ELSE:** NewWetland
Slowed Decomposition	0.10	AVERAGE(Depth, AVERAGE(Freeze, Elev, Warmth, MossCov, WetType, Constric)
Physical Accum	0.00	AVERAGE (OutDura,Gradient, IsoWet)
Methane Limit	0.22	AVERAGE(MossCov, Sedge,SeasPct, Fluctu, Groundw,TreeForm,Wetter, PermWpct)

(2*MAX(HistAccum, PhysAccum) + Productiv +3*MethLimit) /6

Organic Nutrient Export

Historical Accumulation	0.00	IF((NewWetNot=1),AVERAGE(SoilTex,Stained), **ELSE**: NewWet
Current Productivity:	0.08	AVERAGE(Frozen Duration, Plant Cover, Nutrient Availability) WHERE:
Frozen Duration	0.25	AVERAGE(Warmth, Freeze,TidalProx, Groundw)
Plant Cover & Type	0.00	AVERAGE (AqPlantCov, Decid, DecidTree, Gcover, Depth)
Nutrient Availability	0.00	AVERAGE(Wettype,SeasWpct, Fluctu, Nfix, Karst, Granite)]
Export Potential	0.00	AVERAGE [OutDura, Gradient, FloDist, Precip, AVERAGE(Constric, ThruFlo, Interspers, Width, PondedPct, Glacier, Elev)]

(3*ExportPotential+ 2*CurrentProductivity + HistoricalAccumulation) /6

WESPAK-SE model for Aquatic Invertebrates

Structure	0.00	AVERAGE [ABpct,AVERAGE(AqCov, HerbDiv,Gcover,WoodDown,Girreg)]
Hydroperiod	0.00	AVERAGE [PermWpct, SatPct, SeasPct, Fluctu,GroundW)]
Connectivity	0.00	AVERAGE(Interspers,ThruFlo,IsoWet)
Productivity	0.00	AVERAGE [WetType,AVERAGE(Depth, DecidTree, Hardwood, WoodDown,Nfixers, Karst, Granite, Glacier,TidalProx)]
Landscape	0.00	AVERAGE(Imperv,NatVegPctCU,CUbuffLUtype)
Stressors	0.00	AVERAGE[Fish, MAX(AltTime, SedCA,SoilDisturb)]

Function:
AVERAGE
[Struc,Productivity,AVERAGE(Hydropd,Connec,Stressors,LScape]

Value of the function:
MAX(UniqPatch,DistRareTyp,RareWclass,
AVERAGE(AnadFish,ResFish,Amphib,WbirdF,WbirdNest,SongbMam))

Anadromous Fish Habitat

Hydro Regime	0.00	AVERAGE(Depth,SatPct, MAX(SeasWPct, PermWPct),Lake, Interspers,ThruFlo)
Structure	0.00	AVERAGE[Beaver, AVERAGE(Wettype, WoodAbove, AqPlantCov, Shade, Flowing)]
Productivity	0.00	AVERAGE(GroundW, TidalProx, Elev, Wettype, Karst, Nfix)
Landscape	0.00	AVERAGE(NatVegPctCU,BuffLU, ImpervCA)
Stressors	0.67	AVERAGE(NutrIn,SedIn,AltTime, Glacier, ToxData)

Function:
IF((Access=0),0,
IF((AllSat=0),0, ELSE
(AVERAGE(Access,OutDura))
X
(AVERAGE(HydroRegime,Structure,
Productivity,LScape,Stress))

Value of the Function:
MAX
[SalmoShed,AVERAGE(WbirdFeed,S
BMscore), AVERAGE(Fishing, Core,
PopCtr, DistRd), Subsist]

Resident & Other Fish Habitat

Hydro Regime	0.00	AVERAGE(SatPct, Depth, DepthEven, PermWPct,Interspers, IsoDry,ThruFlo)
Structure	0.00	AVERAGE[Beaver, AVERAGE(Wettype,Shade, WoodAbove, ABpct,AqCov)]
Productivity	0.00	AVERAGE(InletOutlet,GroundW, NewWetland,Wettype, Karst, Granite, Nfix, Lake)
Anoxia Risk	0.33	AVERAGE(Warmth, Elev,TidalProx,IceDura,Lake)
Stressors	0.00	AVERAGE(AltTime, Glacier,ToxData)

Function:
IF((Fish Access=0),0,
IF((Water=0),0, ELSE
AVERAGE(HydroRegime,Structure,
Productivity,AnoxiaRisk, Stress))

Value of the Function:
MAX(Waterbird Feeding score,
Subsist,AVERAGE(Fishing,PopDist,
DistRd,Core)))

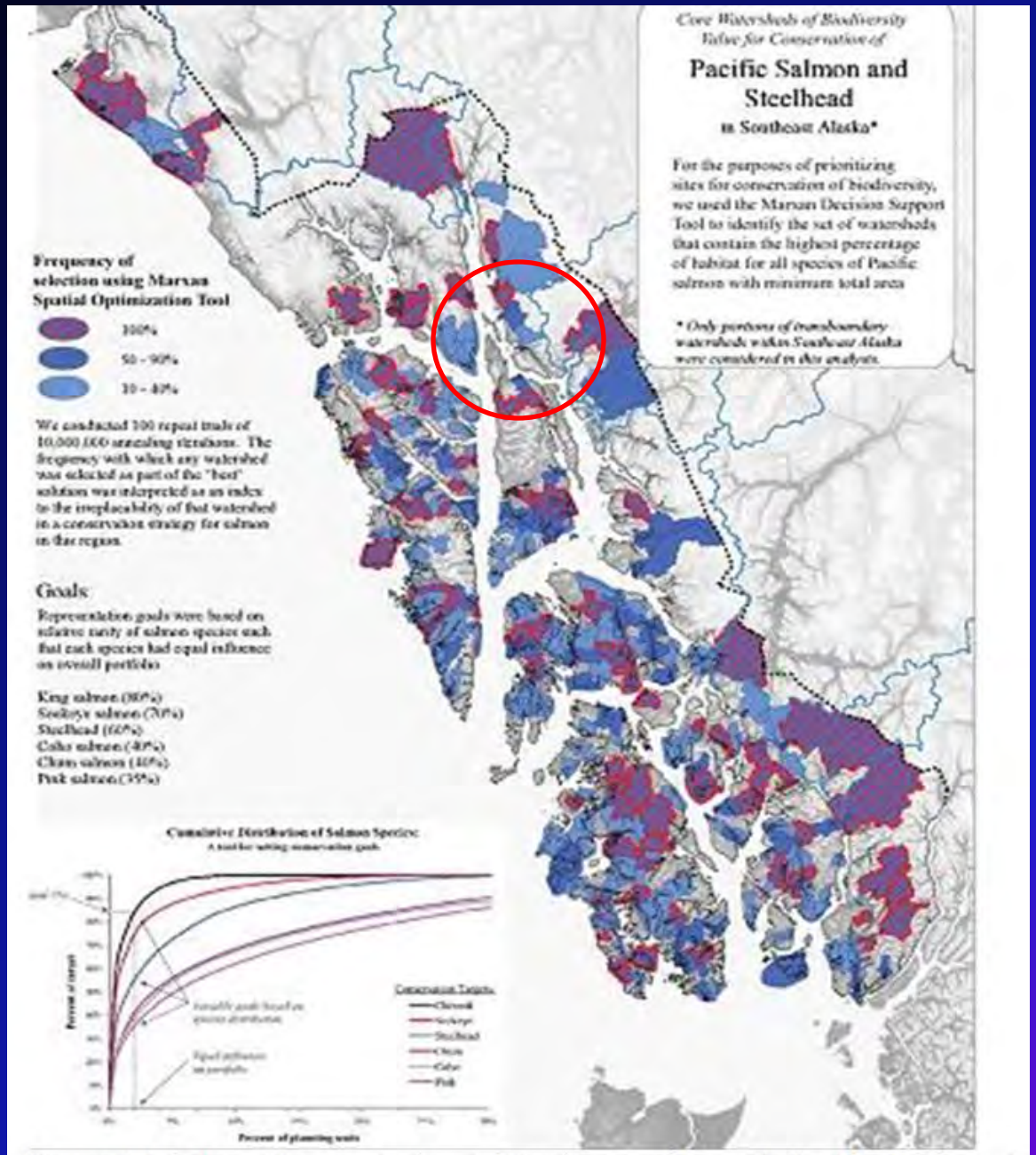


Figure A-1. Salmonid watersheds prioritized for Southeast Alaska (from: Schoen & Dovichin 2007)

Amphibian Habitat

Wood Frog, Western Toad, Long-toed Salamander, Rough-skinned Newt

Hydro Regime	0.00	AVERAGE(Fluctu, SatPct, PermWpct, Ponded, GroundW)
Aquatic Structure	0.00	AVERAGE(ABpct,WoodAbove, Interspers, Vwidth)
Terrestrial Structure	0.00	AVERAGE(WoodDown, ShrubSun,Gcover, Girreg, Inclus))
Productivity	0.00	AVERAGE(Aspect, Gradient, NewWet, Karst, Granite, TreeVar)
Climate	0.33	AVERAGE(Ice, TidalProx, Warmth,Elev)
Landscape	0.14	AVERAGE(NatVegPct, BuffLU, NatVegProx, NatCov2mi, ScapeLU, NatVegSize, RoadCirc)
Waterscape	0.00	AVERAGE(PondPctScape, PondProx)
Stressors (lack of)	0.00	AVERAGE(FishAcc, AVERAGE(RdDis, Toxic, GlacierFed, Core1, Core2, BMP)

Function:

AVERAGE [(AmPres,AVERAGE(Hydro, AqStruc, TerrStruc, Produc, Climate, Lscape, Waterscape, Stress)]

Value of the Function:

MAX
[(AVERAGE(UniqPatch,DistRareTyp, RareWclass, Geog)),
(AVERAGE(WBFscore,SBMscore)]

Feeding Waterbird Habitat

Hydro Regime	0.00	AVERAGE(Ponded, SatPct, MAX(SeasWpct, PermWpct), Depth, DepthEven)
Structure	0.00	AVERAGE[Woody, Mudflat,ABpct, Size, AVERAGE(Interspers, EmPct)]
Productivity	0.00	AVERAGE(Wettype,Fringe, Lake, Algae, Gradient, Fish)
Climate	0.33	AVERAGE(Ice, TidalProx, Warmth, Elev)
Landscape	0.00	AVERAGE(Beaver, Geography, PondPctScape, PondProx,BigPondProx)
Stressors (lack of)	0.00	AVERAGE(Corea, Coreb, BMP, _Tox)

Function:

IF((AllSaturated=1),0,
IF((Wettype=Forested Peatland),0,
ELSE:
AVERAGE(Produc,
AVERAGE(Hydro, Struc, Climate,
Lscape,Stressors)))

Value of the Function:

MAX:
(MAX(Rare,IBAa),
AVERAGE(RareWclass,PondNum,
DuckHunt, PopCtr,Visib)))

Nesting Waterbird Habitat

HydroRegime	0.00	AVERAGE(ISOwet, SatPct, Fluctu, MAX(SeasWpct, PermWpct), Depth, DepthEven)
Structure	0.00	AVERAGE[(Woody,Interspers, AVERAGE(EmPct, Size, Vwidth, AqPlantCov, Snags)]
Productivity	0.17	AVERAGE(Wettype,Gradient, TidalProx, Elev, Acidity,ShoreSlope, Fish, Island)
Waterscape	0.00	AVERAGE(Lake, LakeProx, Fringe,Beaver, PondPctScape,PondProx)]
Stressors (lack of)	0.00	AVERAGE(Core1,Core2, BMP, Toxics)
Landscape	0.00	AVERAGE(NatVegTractSize, BuffLUtype, BuffNatPct,RdDis)

Function:

IF((AllSaturatedOnly=1), 0,
IF((TooSteep=1),0,
ELSE:
(3*AVERAGE(AqPlantCov, Size, Wettype, Wscape)
+2*AVERAGE(HydroRegime,Structure, Productivity) +
AVERAGE(Stressors,Landscape))/6))

Value of the Function:

MAX(PondNum,Rare, IBA, RareWclass)

Songbird, Raptor, & Mammal Habitat

StructureA	0.00	AVERAGE (Gcover, Cedar, Unbrow, Girreg, Cliffs, SnagsD, WoodDown)
StructureB	0.00	AVERAGE (WoodyPct, WoodyEdge, ShrubCanop, ShrubDiv, WoodPatt, TreeTypes)
Productivity	0.00	(AVERAGE(Size,Vwidth))*((AVERAGE(Nfix, Inclus, UpEdge, Hardwd,TidalProx, Elev)))
Landscape	0.00	AVERAGE (Mainland, CUbuffNatPct, CUtypeLU, NatVegProx, NatVegPctScape, ScapeLU, NatVegSize,DeerShed)
Waterscape	0.00	AVERAGE (SatPct, PermWpct, PondPctScape, PondProx, Beaver, Interspers)
Stressors	0.20	AVERAGE (CoreA, CoreB, PopCtr, RdBox, DisRd)

Function:
IF((AllWater=1),0, ELSE: (AVERAGE(PermWpct,AVERAGE(StrucA,StrucB, Produc,Lscape,Wscape,Stress))

Value of the Function:
MAX[Rare, IBA, AVERAGE (RareWclass,PondNum, UniqPatch,DistRareTyp)]

Pollinator Habitat

Pollen Onsite	0.00	AVERAGE(persist, gramin, herbpct, AVERAGE(gcover, herbsens, herbdiv, aspect))
NestSites	0.00	AVERAGE(woodydbh, Snags, downwood, girreg, cliff)

Function:
AVERAGE(Cover2miDiv,PollenOnsite, NestSites)

Value of the Function:
AVERAGE(wetuniq,RareWclass, rareherb)

Native Plant Habitat

Species - Area	0.00	AVERAGE (Width, Size, SatPct)
Landscape	0.00	AVERAGE (Beaver, Slide, NatVegCA, BuffLUpd, PondScape, PondProx)
Aquatic Fertility	0.00	AVERAGE (Interspers, Fluc, SeasWpct, Inflo, Groundw, NewWet, Elev, Depth)
Terrestrial Fertility	0.00	AVERAGE (Nfix, DecidTree, Hardwd, SoilTex, Granite, Karst, Wettype, Moss)
Climate	0.00	AVERAGE (TidalProx, GDD, Aspect)
Competition/ Light	0.00	[MIN (herbPd,WeedSource) + AVERAGE (wood, TreeCovPD, ShrubSun, Girreg, HerbDom)] / 2
Stressors	0.17	AVERAGE (Core1, Core2, BMPsoils, PopCtr, DistRd, AltTime, SedDisturb, Browsed)

Function:
(3xAqFertil + 3xTerrFertil + 2xSpeciesArea + 2xLscape + Climate + Compet + Stressors)/ 13

Value of the Function:
MAX(RarePspp, (AVERAGE(UniqPatch,DistRareTyp,RareWclass, Cedar), AVERAGE(Glean,ScoreSBM,ScorePOLf,ScoreSubsis))))

Public Use & Recognition (Value)

Convenience	0.00	AVERAGE(Ownership,Visibility,RdDist, Core1PU,Core2PU,ElevPU, PopCtrDisPU, TidalProxPU)
Investment	0.00	MAX(MitigaSite,ConsInvest,SciUse)
Recreation Potential	0.00	AVERAGE(RecreaPoten, BMPsoils, BMPwildlife, LakePU)

AVERAGE(Convenience, Invest, RecPot)

Have We Answered These So Far?

___ Explanation of how the metrics are calculated for the 22 functions and 18 values

___ Address the value determination for anadromous fish and an explanation of all 18 values

___ Explain how connectivity has or has not been addressed in the methodology (as addressed in NMFS' comments)

___ Explanation of specific bird habitat questions

___ Explanation of specific questions on amphibians and nitrogen fixers

___ Explanation of weighting for anadromous fish

After Lunch:

- Walk through an example of how you would take a wetland analysis and categorize it; provide different versions of how you would do that.
- Explain how a previous community took the data to categorize wetlands and how the used the data.

Have We Answered These So Far?

___ Explanation of how the metrics are calculated for the 22 functions and 18 values

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After Lunch:

Walk through an example of how you would take a wetland analysis and categorize it; provide different versions of how you would do that.

Explain how a previous community took the data to categorize wetlands and how the used the data.

Table 3. Example of function and value scores and ratings for the function, "Anadromc
eight of the AAs assessed by this study

Site ID	Function score (normalized)	Function rating	Value score (normalized)	Value rating
ER08	8.44	Higher	8.17	Higher
ER71	10.00	Higher	6.67	Moderate
WD15	9.09	Higher	1.75	Lower
ER07	7.26	Moderate	8.67	**Higher**
ER02	4.28	Moderate	6.67	Moderate
EC49	6.19	Moderate	0.50	Lower
ER66	1.55	Lower	6.67	**Moderate**
AB01	0.00	Lower	0.00	Lower

Table 4. For Anadromous Fish Habitat, the number of wetland AAs having different combinations of fun
and value ratings

Function Rating	Value Rating	# of AA's having that combination	%
Higher	Higher	6	2%
Higher	Moderate	25	8%
Higher	Lower	2	1%
Moderate	Higher	8	2%
Moderate	Moderate	26	8%
Moderate	Lower	6	2%
Lower	Higher	0	0%
Lower	Moderate	2	1%
Lower	Lower	256	77%

Table 5. Normalized function scores and ratings for four study area wetlands, with results of six options for calculating an overall score for each wetland

	Site:	ER71		ER02		ER09		ER08	
Group	Function	Score	Rating	Score	Rating	Score	Rating	Score	Rating
1	Anadromous Fish Habitat	**10.00**	H	4.28	M	0.00	L	**8.44**	H
	Resident Fish Habitat	8.60	H	7.09	M	6.61	M	7.48	H
2	Carbon Sequestration	2.65	L	6.87	H	**7.09**	H	2.83	L
	Nitrate Removal	4.84	H	2.12	M	1.84	L	3.11	M
	Phosphorus Retention	3.78	M	3.83	M	4.20	H	3.55	M
	Sediment Retention & Stabilization	3.81	M	2.59	M	6.22	H	4.88	H
3	Invertebrate Habitat	6.22	H	2.75	L	1.88	L	2.23	L
	Organic Nutrient Export	7.32	M	5.35	L	4.51	L	6.57	M
	Stream Flow Support	2.57	L	0.42	L	0.50	L	4.29	M
	Water Cooling	4.85	M	4.28	M	4.60	M	7.51	H
	Water Warming	4.12	M	2.94	M	0.00	L	1.26	L
4	Water Storage	3.98	M	5.96	H	2.56	L	5.90	H
5	Amphibian Habitat	1.55	L	4.04	M	4.36	M	2.90	M
	Waterbird Feeding Habitat	8.07	H	6.33	H	6.71	H	0.00	L
	Waterbird Nesting Habitat	5.61	M	3.86	M	0.00	L	3.98	M
6	Songbird, Raptor, & Mammal Habitat	4.76	M	**7.30**	H	5.19	M	7.53	H
	Native Plant Habitat	4.85	M	4.55	M	3.23	M	5.86	H
	Pollinator Habitat	2.31	L	4.97	M	1.77	L	3.09	L
	Option 2a. Average of All	4.99		4.42		3.40		4.52	
	Option 2b. Maximum of All	10.00		7.30		7.09		8.44	
	Option 2c. (Average + Max)/2 of All	7.50		5.86		5.25		6.48	
	Option 2d. Group Averages, then Average Groups	5.19		4.83		3.35		4.94	
	Option 2e. Group Averages, then Max of Groups	9.30		5.96		4.84		7.96	
	Option 2f. Group Max's, then Average Groups	6.51		6.48		5.46		6.37	

- In the table's Options 2d-f, the functions are placed into thematic groups before doing the final calculations. If the CDD wishes to form such groups that are intermediate in the calculations of each site's overall score, the **membership of the groups may be changed** or stay the same as shown here. The grouping in this table, while recommended, is mainly for illustration.
- The CDD may choose to use **weighted averages** rather than plain averages, with weights for the more important wetland functions decided by the CDD after public input.
- In any of the summarizing calculations, the CDD may choose to include the scores of either or both of two other attributes calculated by WESPAK-SE but which are not truly wetland functions and thus were not shown in the table. Those are: **Public Use & Recognition, and Wetland Sensitivity**.
- Once a particular option is chosen, the overall scores of all assessed sites **must be normalized** (adjusted mathematically to ensure they fully span a 0-to-10 scale) and then converted to ratings by using the recommended statistical procedure (described in section 2.3.3) to identify natural breaks in the distribution of overall scores among those sites.
- The CDD may choose to **weight an AA's overall score by the size** (area) of either the AA or of the AA plus its adjoining AAs, if any. The CDD may also choose to weight an AA's overall score by the AA's **proximity to public roads**, with the assumption that AAs closest to roads are most attractive for development, all other factors being equal. In calculations associated with either option, the CDD must decide whether to weight an AA's overall score based on WESPAK-SE equally with either or both of these factors.
- Any score combination procedure which involves use of averages, maximums, or percentiles will introduce some statistical distortion because the score distributions of different functions differ. Some functions skew high overall, others low; this is due both to differences among functions in the overall capacity of local wetlands to perform those functions and to the structures of the function models. While efforts have been made to reduce this distortion, some is inevitable.

Examples from Other Jurisdictions that Categorize Wetlands Using Function Scores:

- Washington State
- Alberta

How Washington State Rolls Up the Assessment Scores

OVERALL WETLAND CATEGORY _____ (based on functions___ or special characteristics___)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

_____**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

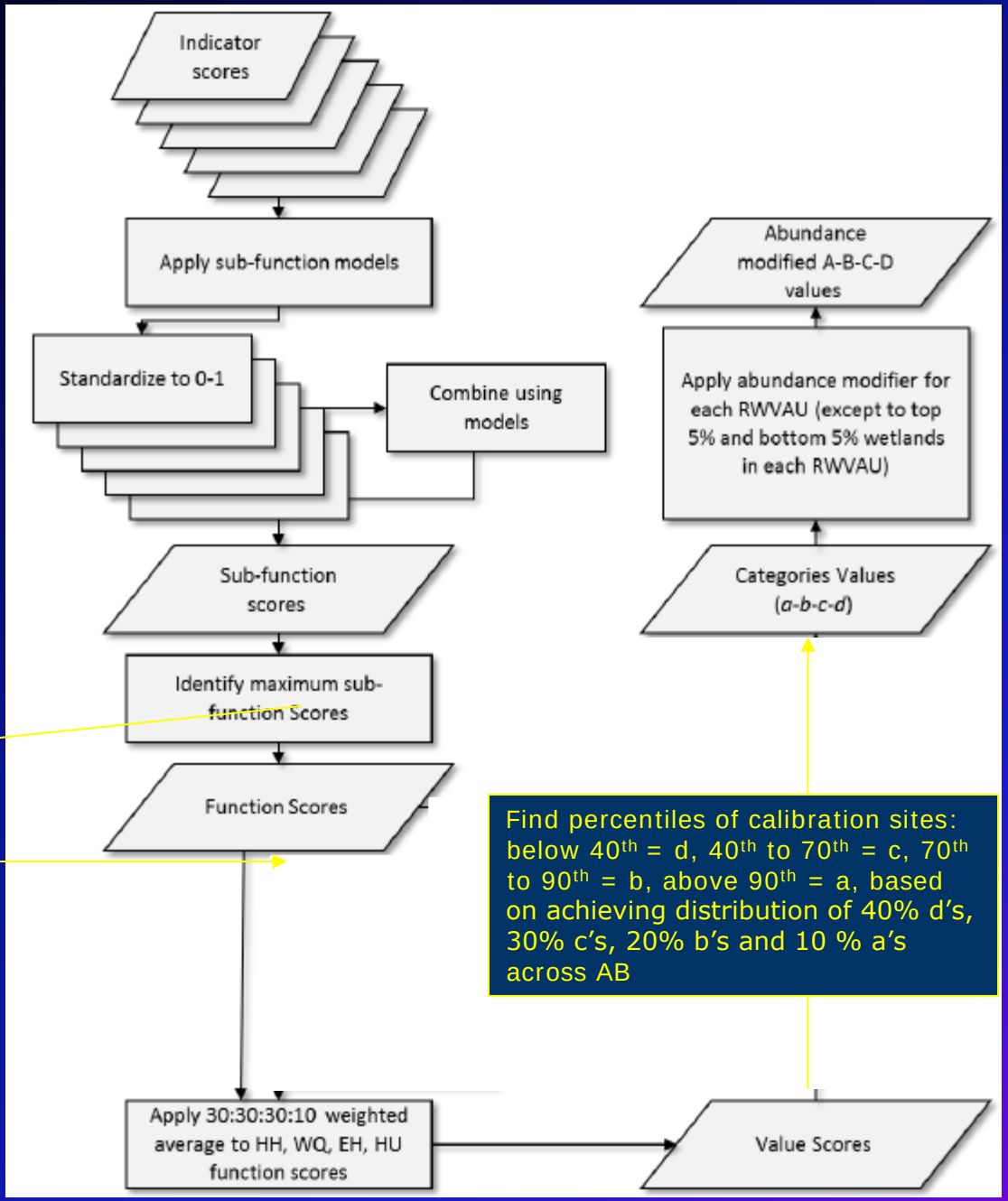
FUNCTION	Improving Water Quality			Hydrologic			Habitat			
	Circle the appropriate ratings									
Site Potential	H	M	L	H	M	L	H	M	L	
Landscape Potential	H	M	L	H	M	L	H	M	L	
Value	H	M	L	H	M	L	H	M	L	TOTAL
Score Based on Ratings										

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

Province of Alberta



Normalize sub-function scores using formula (x-min)/(max – min)

Abundance modifier is based on regional historical loss estimation. In areas of high historical loss, d's turn to C's, c's to B's, b's to A's. In areas of low historical loss, a's turn to B's, b's to C's, and c's to D's. In areas of moderate historical loss, there is no change in grade (a turns to A). Note that the top and bottom 5% (5^{th} and 95^{th} percentiles of the calibration sites) are unaffected by the abundance modifier

Limitations of the Study

- Boundary determinations, not official delineations.
- One-time visit to each wetland.
- Variation within wetlands. Defining rare "types".
- Use of some secondary data sources.
- Scores are not "real" **measures** of functions: indicators, hypotheses.
- Were normalized only to the studied wetlands, not to all Juneau or Southeast Alaska wetlands.
- Expiration dates.
- Nobody fully understands what drives a wetland's functions.
- Score distributions of different functions differ.
- Modifying data inputs would require re-doing entire study.
- Modifying models now would require recomputing all scores and would deviate from the WESPAK-SE version being used elsewhere in the region.

Have We Done These Adequately?

___ Walk through an example of how you would take a wetland analysis and categorize it; provide different versions of how you would do that.

___ Explain how a previous community took the data to categorize wetlands and how the used the data.