Port Gravina Quarry Project
Environmental Assessment

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Chapter 1—Purpose and Need and Proposed Action

Introduction

This Environmental Assessment (EA) is being prepared in compliance with the National Environmental Policy Act (NEPA) and tiers to the Chugach National Forest Land and Resource Management Plan, hereafter referred to as the Forest Plan (USDA Forest Service 2002). This proposed activity implements the Forest Plan and is subject to 36 CFR 218, subparts A and B.

Additional documentation, including more detailed analyses of project-area resources, is in the project planning record.

Background

The Chugach National Forest (CNF) has prepared this environmental analysis to evaluate the access and surface occupancy of National Forest System lands by Chugach Alaska Corporation (CAC) for the development of its private subsurface mineral rights beneath National Forest System surface estate lands.

The ownership history of project-area lands, which left and then later re-entered into federal ownership, has shaped mineral rights. Surface and subsurface lands in the project area were included in the Chugach National Forest by Presidential Proclamation in 1907. In 1978, lands in the project area were transferred out of federal ownership to fulfill land entitlements established under the Alaska Native Claims Settlement Act (ANCSA). The Eyak Corporation received title to the surface estate and CAC received the subsurface estate. In 1999, the United States acquired the surface estate of the majority of the project area with Exxon Valdez Oil Spill (EVOS) settlement funds authorized by the EVOS Trustee Council as part of its Habitat Protection Program. The Chugach National Forest became the steward of the federally acquired surface estate; CAC retained the subsurface estate.

Chugach Alaska Corporation has “outstanding mineral rights” to private minerals contained within the subsurface estate. Outstanding mineral rights are those rights owned by a party other than the surface owner at the time the surface was conveyed to the United States. Generally, common variety minerals are part of the surface estate. However, on lands conveyed under the provisions of ANCSA, these minerals belong to the subsurface estate. Chugach Alaska Corporation has a right to access and develop its subsurface estate.

On May 16, 2014, CAC notified the Forest Service of its intent to perform mineral exploration within a portion of the project area. The purpose of the mineral exploration was to gather geologic data at two blast sites to assess the feasibility of a commercial rock quarry. On November 11, 2014, the Cordova District Ranger issued a Notice to Proceed for the mineral exploration. A special use permit was issued for surface occupancy of a temporary camp. A NEPA analysis was conducted for these short-term activities. CAC began exploration activities in March 2015 and completed them in April 2015.

On June 2, 2015, CAC submitted an operating plan providing notice to the Forest Service of CAC’s intent to develop the subsurface estate. The operating plan included the construction and maintenance of an access road, two stone quarry sites and two work pads, a temporary dock for project development, a permanent dock for operations, and a lay down area. A camp and possibly an airstrip would be located on adjacent CAC privately owned surface lands. The operating plan was updated with additional details and modified designs on June 24, 2015, September 8, 2015, and February 5, 2016. Appendix A includes February 2016 version. All operating plan submissions are available in the project record.
The Project Area

For the majority of the project area, the Chugach National Forest is the steward of the surface estate and CAC owns the subsurface estate. The project area is approximately 145 acres; 96 acres are Forest Service surface and CAC subsurface, 43 acres are CAC surface and subsurface and six acres are tidelands. The area of direct surface impact where ground disturbance is proposed to occur is about 100 acres including approximately 83 acres of Forest Service surface lands.

The project area is located near Secret Cove in Port Gravina within sections 28, 29, 32, and 33 of T. 13 S., R. 5 W., Copper River Meridian (CRM) in Prince William Sound on the Cordova Ranger District of the Chugach National Forest. It is located approximately 30 air miles south of Valdez and 16 air miles west-northwest of Cordova, Alaska.

Where the United States owns, and the Chugach National Forest manages, the surface estate; surface estate lands are included within the Fidalgo-Gravina Inventoried Roadless Area.

EVOS-acquired National Forest System surface estate lands in the project area are subject to a conservation easement that allows the State of Alaska and The Eyak Corporation to enforce the restrictive covenants associated with the title conveyed to the United States. Both the conservation easement deed and deed for the surface estate acknowledge the subsurface owner’s rights and provide that, in accordance with applicable law, those rights are not affected or limited by the surface ownership interests.

There are no pending land selections by Alaska Native corporations or the State of Alaska within or adjacent to the project area.

Purpose and Need

Chugach Alaska Corporation’s notification of its intent to exercise private mineral rights beneath National Forest System surface lands has prompted the need for this analysis. The purpose is to respond to CAC’s notice of surface occupancy to access and develop its mineral estate by providing stipulations, for inclusion into CAC’s operating plan, necessary for the protection and management of the National Forest System surface estate. The need is for the Forest Service to promptly respond to CAC’s notice of surface occupancy as required by Forest Service Manual 2830.

Proposed Action

The Forest Service proposed action is to issue a Notice to Proceed to CAC after reasonable stipulations for use and reclamation of the National Forest System surface estate are negotiated and incorporated in the operating plan. Stipulations are included in Appendix B.

Chugach Alaska Corporation (CAC) has proposed to develop and operate a stone quarry in Port Gravina. The CAC proposed action is to access, develop, and transport minerals (granite) from its private subsurface estate which underlies National Forest System surface estate lands. The operating plan included in Appendix A provides details on the infrastructure and activities associated with this project. To support quarry development and operations, CAC is also proposing to build a dock. On adjacent CAC lands, CAC plans to locate a camp and possibly an airstrip. These are considered connected actions and are considered in the effects analyses along with activities occurring on the National Forest System surface estate. CAC’s proposal indicates its intent to submit permit applications to other agencies, including but not limited to the State of Alaska and Army Corps of Engineers, for various project components. A list of required permits and plans is included in Appendix B.
Figure 1. Location map
Decision Framework

The Forest Service regulatory authority for all uses of National Forest System lands with certain exceptions, are designated “special uses” under 36 CFR 251, subpart B. The agency is also guided by Forest Service Manual 2830.2 to administer outstanding mineral rights in a manner that minimizes damage to National Forest System resources.

Because CAC’s subsurface estate is the dominant estate, it is entitled to make reasonable use of the surface estate to develop its resources. The Forest Service may not deny use of the surface estate for this purpose but it may negotiate changes to the operating plan to ensure that the use is reasonable.

Stipulations identified by and under the authority of other agencies will be included or referenced in the Forest Service’s Notice to Proceed. It is our intent, through this analysis, to disclose effects of the proposed action. It is not our intent to override any other agency jurisdiction.

The responsible official and decision maker for this project is the Cordova District Ranger. The decisions to be made are:

• Whether the proposed use of National Forest System lands is prudently necessary for the proposed operations;
• Whether or not the operating plan is consistent with the Forest Plan;
• Identify reasonable stipulations to be incorporated into the operating plan for the protection and reclamation of National Forest System surface lands and resources; and
• Consider a closure order for public safety.

Relationship to the Chugach Forest Plan

All National Forest System lands managed by the Chugach National Forest have a management area designation in the Chugach Forest Plan. Lands in this project area are designated as part of Management Area (MA) 221, EVOS Acquired Lands. This MA includes all lands that were purchased with EVOS settlement funds. In most cases, the Forest Plan management area direction for MA 221 would apply to Forest Service activities associated with lands in this project area. As is described in the Forest Plan, there is one circumstance when Chugach National Forest lands temporarily adopt a different management area designation than the one they would normally fall under. This occurs when an operating plan for mineral development has been submitted and is in effect. Under this circumstance, MA 521—Minerals Management Area direction is applied to the lands included in the operating plan while the operating plan is in effect. This proposal is evaluated using Forest Plan direction for MA 521 because an operating plan will be in effect when these activities take place.

The Minerals Management Area acknowledges the rights of subsurface owners. It is less restrictive than MA 221—EVOS Acquired Lands, but it does require the Forest Service to “manage the underlying minerals activities to be as compatible as possible with the underlying (initial) management area prescription” (Forest Plan 4-87). Thus, the Forest Service is not required to comply with the standards and guidelines of MA 221 while the operating plan is in effect, but should strive to work with CAC to make activities as compatible as possible with those standards and guidelines.

Public Involvement

A Scoping Notice was published in the Valdez Star on July 1, 2015 and in the Cordova Times on July 3, 2015 to notify the public that the Forest Service had received notice from CAC of surface occupancy for
the exercise of outstanding rights. A detailed scoping letter was mailed to agencies, stakeholders, and other interested parties on July 3, 2015. Scoping comments were requested by August 3, 2015.

In accordance with Section 101(d)(6)(B) of the National Historic Preservation Act, the Forest Service consulted with the Native Village of Eyak, Native Village of Tatitlek, The Eyak Corporation and the Chugach Alaska Corporation. Consultation was conducted for the purpose of eliciting views of Alaska Native tribes and corporations on all aspects of the Section 106 compliance process during the earliest feasible steps of project planning.

The Forest Service also engaged with the State of Alaska Department of Natural Resources regarding the conservation easement the state holds on NFS lands in the project area.

**Comments Received**

Eleven comment letters were received from individuals, outfitters, non-governmental organizations, and Alaska Native corporations and were considered when developing project issues. Three letters expressed support for CAC’s project, and eight expressed concerns regarding impacts to the natural environment or forest users. Comment letters are included in the project record.

Four general areas of concern were identified in the comments. These concerns were considered by the Forest Service and associated effects to National Forest System lands and resources are disclosed in this analysis. Reasonable stipulations were developed to minimize damage to surface resources and impacts to forest users when necessary. The four general areas of concern identified by commenters are summarized below.

1. **Impacts to fish and wildlife**

Some commenters were concerned that the project will have impacts to marine mammals including humpback whales, orcas, Steller’s sea lions, harbor seals, Dall’s and harbor porpoise, salmon shark; marine fish including salmon and herring; seabirds including scoters; and game species including both black and brown bears, and mountain goats. Effects to marine mammals were evaluated by the Forest Service; additional consultation and analysis will be completed by the National Marine Fisheries Service and Army Corps of Engineers.

2. **Effects to roadless character of the area**

Some commenters were concerned about the effect of the project on the character of the Fidalgo-Gravina Inventoryed Roadless Area specifically mentioning scenic qualities; tranquility; wilderness appeal; scenic, recreational, and biological attributes; and conservation.

3. **Impacts to Forest users**

Some commenters felt that the project would negatively impact recreationists and outfitter guides due to increased traffic, noise, visual and aesthetic effects and would affect animal behavior and disrupt the flow of game through the area.

4. **Effects on wetlands and streams**

Some commenters were concerned about project effects on wetlands and streams, including those resulting from construction activities such as filling wetlands, relocating a stream, and stockpiling and stabilizing soil.
Reclamation

Chugach Alaska Corporation’s operating plan provides that certain actions will be taken to reclaim the Port Gravina Quarry site upon completion of the project. Fences and signs would be installed as safety precautions, and the rock face would be stepped to limit rockfall hazards. The quarry area, including all road and pad footprints, would be restored to a look similar to the local surroundings.

The Notice to Proceed will be issued once the required stipulations addressing various reclamation components are included in the operating plan; including the retention of local soils for use in reclamation, and an agreement that CAC utilize native plant species where conditions are not favorable for natural revegetation. A detailed Quarry Reclamation Plan will be submitted by CAC prior to project implementation and will address removal of all structures, equipment, and other supplies from the site; removal of bridges and culverts; excavating and/or scarifying of roads and constructed pads; reshaping disturbed areas, benching of quarry highwalls and stabilizing of overly steepened slopes; covering disturbed areas with soil and other organics from stockpiles created at the time the area is stripped to encourage natural revegetation; use of best management practices to reduce erosion and maintain stormwater runoff; and controls for public safety.

CAC is responsible for submitting its reclamation plan to the State of Alaska, Department of Natural Resources to obtain any necessary approvals under AS 27.19 or other applicable state laws or regulations.
Chapter 2—Alternatives

This chapter describes the alternatives considered and analyzed for this proposal. It also provides a rationale for why some additional alternatives were considered but not analyzed in detail.

Developing Alternatives

Section 102 (e) of NEPA states that all Federal agencies shall, “study, develop, and describe appropriate alternatives to recommend courses of actions in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” Two alternatives were developed and analyzed in detail. Alternative 1, the “no action” alternative, is used as a baseline in order to compare and contrast effects of the proposed action. Alternative 2 is the proposed action.

The range of alternatives analyzed in detail is limited and reasonable based on the narrow scope of the decision to be made by the responsible official. CAC has made the decision to access and develop its mineral rights through submission of its operating plan. The proposed action is an outcome of negotiations with CAC as to what would provide reasonable access to their estate.

In addition to Alternatives 1 and 2, three other alternatives were considered but eliminated from detailed analysis. All alternatives are described below.

Alternative 1 (No Action)

Under the No Action alternative, the Forest Service would not issue a Notice to Proceed and no quarry would be developed. There would thus be no ground disturbing activities or vegetation removal associated with this project. This alternative serves as a baseline analysis for comparison of environmental effects; however, this alternative is not selectable because the responsible official does not have the authority to deny CAC reasonable use of the surface for the exercise of outstanding mineral rights.

Alternative 2 (Proposed Action)

The Forest Service proposed action is to issue a Notice to Proceed to CAC after reasonable stipulations for use and reclamation of the National Forest System surface estate are negotiated and incorporated in the operating plan. See Appendix A for CAC’s operating plan. Proposed stipulations for the revised operating plan are described in Appendix B.

Alternatives Considered but Not Analyzed in Detail

Alternate dock location:

Chugach Alaska Corporation analyzed three dock locations and three different dock designs in their permit application to the US Army Corps of Engineers. One dock site was considered but not evaluated in detail because of the need for a substantially longer access road, a large bridge, and greater visual impacts, impacts to cultural resources and impacts to an anadromous stream. Another potential dock site that was considered but not evaluated in detail was on the peninsula at Secret Cove which would have engulfed the small island and made the dock more visible from Port Gravina, resulted in impacts to cultural resources and potential impacts to historic bald eagle nesting/roost sites. Additionally, these sites have inadequate water depth (bathymetry of the subsurface tidelands). Due to these concerns the interdisciplinary team determined that these alternative locations would not meet the purpose and need of minimizing impacts to the surface estate. These alternative locations were not considered further or analyzed in detail.
**Alternate camp location:**
Because of the remote nature of the area, a temporary camp is reasonably necessary for development of CAC’s subsurface estate. The Forest Service considered whether, to reduce impacts associated with the camp access road, including one stream crossing, the camp could be located closer to the dock, on National Forest System lands instead of on adjacent CAC lands. The 4.0 acre camp pad would need to be relocated to National Forest System surface lands under this alternative. The Forest Service did not pursue this alternative with CAC because this would result in greater overall impact to public lands and thus would not meet the purpose and need.

**Land exchange/sale:**
Some commenters suggested that the Forest Service work with the EVOS Trustee Council and CAC on either a land exchange or sale in order to protect the surface estate from the effects of subsurface development. The purpose and need for this project is for the Forest Service to promptly respond to CAC’s notice of subsurface occupancy. CAC has not submitted a proposal to the Forest Service or the EVOS Trustee Council regarding a land exchange or sale, they have submitted a proposal for development. Thus, a land exchange is outside the scope of this analysis and is not an alternative considered in detail.
Chapter 3—Affected Environment and Environmental Consequences

This section provides a summary of the environmental effects of each alternative. It discusses the effects relative to the public comments received as well as the applicable physical, biological, and social environments within the project area. The discussions of resources and potential effects incorporate existing information included in the 2002 Revised Forest Plan Final Environmental Impact Statement, project-specific resource reports and related information, and other sources as indicated. The planning record for this analysis contains these sources of information as well as results of field investigations and public involvement efforts. Information from the record is available upon request.

For many resources, the area analyzed for direct, indirect and cumulative effects is the project area and the timeframe for effects analysis is from the beginning of project implementation through reclamation. If effects analysis areas differ, they are described in the resource sections of the EA. Additional explanation and information is included in the project record.

Mineral exploration conducted by CAC in the project area in 2015 is generally considered as part of the existing condition of the project area and thus may not be explicitly described in the resource effects sections. There are no additional known or reasonably foreseeable future activities proposed in the project area, either on NFS surface estate or CAC lands.

All acreages used throughout this document are approximate.

Inventoried Roadless Areas (IRA)

In May 2001, the USDA Forest Service issued the Roadless Area Conservation Rule (Roadless Rule). This rule established prohibitions on road construction, road reconstruction, and timber harvest in inventoried roadless areas on NFS lands. The intent of the Roadless Rule is to provide lasting protection for inventoried roadless areas within the National Forest System in the context of multiple-use management.

The Roadless Rule generally prohibits road construction or reconstruction and timber harvest in inventoried roadless areas, but the Rule does contain some exceptions to this prohibition. 36 CFR 294.12 (b) states that “a road may be constructed or reconstructed in an inventoried roadless area if the Responsible Official determines that one of the following circumstances exist: (3) A road is needed pursuant to reserved or outstanding rights, or as provided for by statute or treaty” and that “timber may be cut, sold, or removed in an inventoried roadless area if... (2) The cutting, sale, or removal of timber is incidental to the implementation of a management activity not otherwise prohibited by this subpart” (36 CFR 294.13(b)(2)). This project falls under these exceptions.

Roadless characteristics (i.e., values or features that make the area appropriate and valuable for wilderness) are described in the November 2000 Forest Service Roadless Area Conservation FEIS (USDA 2000, Vol. 1, pp. 3-3 to 3-7) and are also described in the Roadless Area Conservation Rule (66 FR 3,254). FSH 1909.12, Chapter 70 provides guidance on how to evaluate the landscape in terms of these characteristics. For this project-level analysis, effects on wilderness character as evaluated in terms of the characteristics described in the FSH and as they may change from the current conditions as described in Appendix C of the FEIS and updated in the 2015 Wilderness Inventory and Evaluation and incorporated by reference into this document.
This project was under development when the 2015 document was written and the Port Gravina development is acknowledged in the evaluation process in the 2015 report (page 58). The area was still included in the inventory and thus the inventory process is not revisited in this analysis.

This evaluation considers both the version of FSH 1909.12 that was in effect when the 2002 Forest Plan was completed as well as the planning directives that are currently in effect for wilderness evaluation. This inclusive approach is used to best incorporate possible effects to roadless character.

**Summary of Effects**

There would be no direct, indirect or cumulative effects on any inventoried roadless areas from implementation of the no action alternative. The proposed action will have direct and indirect effects to some of the roadless characteristics of the Fidalgo-Gravina Inventoried Roadless Area. It would affect the natural appearance and integrity of the project area as well as opportunities for solitude and primitive recreation. These effects would be localized, though effects from noise and on visual quality would extend, to varying degrees, beyond the project area. Effects from noise would be the most temporary, and all effects are expected to diminish once the project ends and reclamation activities are completed. Due to the small scale and scope of these activities and effects relative to the overall 530,000-acre IRA, the project is not expected to affect the overall character of the Fidalgo-Gravina IRA.

**Analysis Area**

The analysis area for direct, indirect and cumulative effects is the Fidalgo-Gravina IRA. This analysis area was chosen because it is consistent with the criteria used in the Forest Plan FEIS analysis for inventoried roadless areas and their potential to be studied for Wilderness designation. This analysis area was confined to the Fidalgo-Gravina IRA due to the location of the project area within the IRA and its substantial distance from other IRAs. The expected direct, indirect, and cumulative effects should not impact other IRAs.

Direct, indirect and cumulative effects are measured from 2001, when the Roadless Rule was implemented, through 2045, when implementation (20 years) and reclamation and some regeneration of vegetation (ten years) associated with this project is expected to be complete.

Approximately 7,300 acres of the Knowles Head Peninsula was logged in the 1990s, prior to NFS ownership, and a habitat improvement project developed by the FS is currently underway to thin regenerating trees to improve wildlife habitat and restore the Knowles Head area’s natural ecosystem composition and structure. Outfitter-guides have been and will continue to operate in the IRA, a Forest Service public use cabin exists in Jack Bay and a communication site lease exists on Jack Peak.

**Existing Conditions**

Appendix C of the FEIS for the 2002 Revised Forest Plan describes the existing condition of the 530,310-acre Fidalgo-Gravina IRA as of that time. The draft Chugach National Forest Wilderness Inventory and Evaluation, published as part of the ongoing Forest Plan revision process, provides an updated existing condition for the IRA. Very little has changed between the 2002 and 2015 conditions. The full description of the existing condition (from the two above-referenced documents) is not repeated here but is included in the project record. The following is a brief summary of the existing condition of wilderness character as taken from these reports. This pertains to the entire IRA and is not specific to the project area.

This IRA has a very high degree of natural integrity and most of the IRA is natural appearing. Some evidence of human activity exists, but there is very little development and human activity has little to no effect on the natural appearance of the area.
Opportunities for solitude are moderate to high. Marine-based recreation and commercial activities in Prince William Sound may be seen and heard from the shoreline area or inland areas near shore, though topographic screening is generally high. Opportunities for primitive recreation are generally high due to lack of development and the remote nature of the area.

Special features/other values that were identified in this IRA in both reports include the Olsen Creek Research Natural Area, four known cultural sites, and Cochlearia sessilifolia, an Alaska Region-listed sensitive plant. None of these features or values occurs in or near the project area.

The 2015 Inventory and Evaluation summarizes the challenges to wilderness suitability for this IRA as “Amount of state, private and EVOS lands (split estate), opportunities for solitude along coastline impacted by activities on adjacent marine waters” (p. 19).

The IRA contains approximately 58,000 acres of EVOS-acquired lands, where the surface estate was purchased and is managed by the Forest Service but the subsurface estate is owned by Chugach Alaska Corporation. The 2015 evaluation acknowledges this subsurface ownership, the potential for development of the subsurface estate, and the potential impacts from this proposed project.

**The project area relative to the entire Fidalgo-Gravina IRA**
The project area is located along the southern shoreline of Port Gravina in Prince William Sound. It is adjacent to a 3200-acre parcel of undeveloped private land owned by Chugach Alaska Corporation. It is on the “edge” of the IRA, and due to its proximity to private lands and water, the ability to manage it for roadless character is more limited than some other portions of the IRA.

**Environmental Effects**

**Measurement Indicators**
Two indicators are used to evaluate the effects of this project on roadless characteristics:

1. Percent of IRA affected by tree removal and new and temporary road construction.
   - This indicator was used because 36 CFR 220.5(a)(2)(i) suggests that the amount of the IRA impacted by road construction and timber harvest may be one way to measure the degree and significance of impacts of a project on a roadless area.

2. Potential change to the roadless characteristics of the inventoried roadless area.
   - This indicator was used because it evaluates the potential change to the qualities used to determine wilderness character. Because these characteristics have been defined prior to this project, there is a defined existing condition against which to compare and contrast project effects.

These measurement indicators were chosen because one of the issues raised with this project is its impact on the roadless character of the area. Timber harvest and road construction are two measurable metrics by which this impact is often measured. Changes to roadless characteristics are more difficult to quantify, but are also important measures of the impacts of this project.

Wilderness character evaluated in this analysis includes (from FSH 1909.12, Chapter 70):

- Natural appearance and integrity (Apparent naturalness)
- Opportunity for solitude
- Opportunity for primitive recreation
- Special features/other values (ecologic, cultural, geologic, scientific)

Alternative 1—No Action

Direct and Indirect Effects
Under the No Action alternative, no quarry development would occur. The area would remain in a relatively undisturbed state and roadless character would remain much the same as it is today. Natural appearance/integrity would remain very high. Opportunities for solitude would remain moderate to high, though marine-based recreation and commercial activities may be evident from areas adjacent or visible to Prince William Sound. Anchorages and beaches would continue to be used by boaters and kayakers. Ongoing activities, including occasional hunting and recreating in the project area, would likely continue. The opportunity for primitive recreation would remain high. There would be no direct or indirect effects from the no action alternative on roadless character, nor would this alternative affect the eligibility of this IRA for future wilderness consideration.

Cumulative Effects
Because there are no direct or indirect effects from the No Action alternative, there would be no cumulative effects.

Alternative 2—Proposed Action

Stipulations and monitoring
Stipulations have been developed to minimize effects to various resources, including scenery, watershed, soils, wildlife, etc. These stipulations are described in Appendix B. These stipulations will also reduce effects of this proposed project on roadless characteristics. Discussion of these stipulations and their effects is by resource area and is located in their respective resource discussions and reports.

Direct and Indirect Effects
The portion of the project area on NFS lands is approximately 100 acres, which is 0.02% of the 530,310 Fidalgo-Gravina IRA. The project would have direct and indirect effects to the surface estate within the project area. Noise effects will travel beyond the project area and visual effects will be mostly limited to the project area but may affect some boaters on the water in Port Gravina.

Natural appearance/natural integrity: The overall natural appearance of the project area would be affected, as much of the surface would be excavated and removed. Construction of the dock and infrastructure along the water will affect the natural appearance as seen from shore. The Scenery resource report provides detail on the nature of the effects of this project on scenery, scenic integrity objectives, and visual quality. Boaters travelling from the head of Port Gravina toward Prince William Sound would likely have some view of the quarry area for approximately 5.5 miles of travel. In the project area, evidence of human disturbance will be very high for the duration of the quarrying activities but will begin to decline once reclamation is complete. Natural appearance and integrity will gradually improve once activities cease and the area begins to revegetate. Stipulations such as stockpiling stripped organic material for reclamation will speed up site recovery and help to promote a more natural appearing landscape.

Opportunity for solitude: Within the project area, opportunity for solitude will be greatly reduced during project operations, estimated to occur for the next 20 years. The presence of workers and the sights and of operations will affect recreationists and hunters in Secret Cove and within the project area. Noise associated with the operation of equipment, boats, and blasting will impact the opportunity for
solitude beyond the footprint of the project area. If blasting is not occurring, noise effects will be relatively limited except in the greater project area. These effects will be considerable during operations, but are temporary. During times when the mine is not in operation, effects on solitude will be minimal and primarily confined to the project area. Once operations are complete, opportunity for solitude will be restored.

**Opportunity for primitive recreation:** The recreation report describes the effects of this project on recreation opportunities, including primitive recreation. Opportunities for primitive recreation will be reduced in the project area during project implementation. Effects are limited to the project area and its immediate surroundings and would affect a very small percentage (below 1%) of the IRA.

**Special features/other values:** The proposed action would not have any direct or indirect on any of the special features or values identified in the two wilderness character evaluations for the Fidalgo-Gravina IRA because none of them occur in or near the project area.

**Summary of direct/indirect effects:** This project will have substantial direct and indirect effects on natural appearance/integrity, opportunity for solitude and opportunity for primitive recreation within the 100-acres of project area on NFS lands. Effects from noise associated with operations will extend beyond the project area within the IRA (see recreation report). Noise effects will be the most temporary, as they will only occur when the mine is operating. Bursts of noise from blasting will be felt the farthest distance but will also be the shortest in duration. Visual effects to the project area will be longer in duration, but visual quality and natural appearance will improve once quarrying activities and reclamation are complete. While these effects will be substantial in the short-term, they are localized in nature relative to the entire 530,000 acre IRA and will diminish once mining activities are complete. Based on the nature of these effects, the small size and scope of the project relative to the entire IRA, and the location of the project area relative to private lands and the remainder of the IRA, it is not expected that this project will have a significant effect on the Fidalgo-Gravina IRA or affect the eligibility of the Fidalgo-Gravina IRA for future wilderness consideration.

The recreation section provides additional information regarding effects on the recreation experience, including solitude, natural appearance and other components of roadless character.

**Cumulative Effects:**

This project in conjunction with other past, present and foreseeable project in the Fidalgo-Gravina IRA, is not expected to have a significant effect on the roadless characteristics of the IRA. Negative impacts from the Knowles Head project are expected to be limited and very temporary, as the project was designed to restore the natural characteristics of ecosystem composition and structure. Special uses are well distributed across the landscape and while the cumulative impacts of these activities may have minimal effects on several isolated areas, they will not affect the overall eligibility of the IRA for future wilderness consideration. The effects of all of these projects overlapping in space and time in this IRA will have very minimal effects on the overall condition of the IRA and should not affect its eligibility for future wilderness consideration.
Summary of Effects on Measurement Indicators

<table>
<thead>
<tr>
<th>Measurement Indicator</th>
<th>Alternative 1 – No Action</th>
<th>Alternative 2 – Proposed Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of IRA affected by tree removal and new and temporary road construction.</td>
<td>0</td>
<td>0.02% (100 acres of 530,000 acre IRA)</td>
</tr>
<tr>
<td>Potential change to the roadless characteristics of IRA</td>
<td>None</td>
<td>Impacts to roadless characteristics will occur on a very small portion of the IRA. Some impacts will be very noticeable during construction and operation but effects are expected to be temporary, limited in scope and size, and would not affect eligibility of the IRA for future wilderness consideration.</td>
</tr>
</tbody>
</table>

Statutory and Regulatory Consistency

<table>
<thead>
<tr>
<th>Regulatory Requirement</th>
<th>Alternative 1 – No Action</th>
<th>Alternative 2 – Proposed Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001 Roadless Area Conservation Rule</td>
<td>Consistent—no timber harvest or road construction/reconstruction in IRA</td>
<td>Consistent—proposed activities fall under exceptions identified in RACR.</td>
</tr>
<tr>
<td>Forest Plan/NFMA</td>
<td>Consistent. Forest Plan does not have guidance specific to IRAs.</td>
<td>Consistent. Forest Plan does not have guidance specific to IRAs.</td>
</tr>
</tbody>
</table>

There are no Forest Plan standards or guidelines or other components specific to inventoried roadless areas. Because there are no Forest Plan components specific to inventoried roadless areas, this project is considered consistent with the Forest Plan relative to IRAs.
Figure 2. Fidalgo-Gravina Inventoried Roadless Area map
Soils

**Summary of Effects**

By the nature of subsurface development activities, there will be unavoidable adverse impacts to the soil resource that cannot be minimized or effectively mitigated. This is permissible for mineral development but must be disclosed. Soils of quarry areas will be entirely excavated, and natural organic and mineral soil horizons will be incidentally mixed, prior to reapplication for reclamation. Soils that overlay work pads will be extensively trafficked by heavy equipment, causing extensive compaction throughout that will require reclamation. Reclamation includes salvage and stockpiling of soils and recovering disturbed areas during reclamation to support revegetation. To the extent that soils are conserved onsite, not lost to erosion or mass wasting, and reapplied in a reasonably un-compacted condition (or restored to such), long-term soil management objectives are satisfied. The land will ultimately remain in productivity of vegetation, with natural soil drainage and ecological function permanently altered.

With application of best management practices, both alternatives are in compliance with applicable regulatory requirements and the Chugach Forest Plan.

**Analysis Area**

The analysis area for direct effects is bounded spatially by the area of direct disturbance. For indirect and cumulative effects, the analysis area additionally includes adjacent downhill areas, specifically slopes to the north of the east quarry and both work pads, and west of the lay down pad; these areas may additionally be affected by runoff from the project area, bordering Secret Cove and Port Gravina respectively. Forest Service Handbook direction indicates that the activity area (where ground surface impacts occur) is the appropriate scale to analyze project effects on soil resources.

The analysis is bounded in time by the foreseeable future period during which effects of this project could persist as detectable, substantial effects. Some soil impacts, such as cover reductions, can naturally recover quite quickly. Others, such as compaction and effects of displacement, can persist for decades. In general, effects are discussed as short-term (< 5 years) or long-term (> 20 years) effects. This quarry development project is proposed to occur over the next 20 years, and post-reclamation natural revegetation is expected to progress gradually over the next several years beyond that. Thus the length of time effects are considered for impacts is the next 25-30 years.

The only past activity, CAC Exploration, occurred in the past year and is connected to the proposed future activity, CAC Development. No future activities beyond the proposed subsurface development and subsequent reclamation are known or anticipated in the analysis area or greater adjacent areas.

**Existing Conditions**

Soils were inspected during a 2-day site visit in June 2015. Soil pits were inspected at representative topographic locations chosen in the field. Soils are all mostly mineral soils with a highly organic surface horizon, varying mainly in drainage and depth with topographic position. As reclamation materials, these various soils are considered fairly similar.

Soils are well drained under better timbered areas to poorly drained in muskeg flats; most of the area is intermediate, or somewhat poorly drained. Soil depth ranges from shallow over bedrock (6-8 inches) to > 2 feet deep. Soil productivity is inherently low for timber, due mainly to soil depth and climate.

Current condition of soils is essentially pristine – undisturbed by any past management and unaffected by Exxon Valdez oil spill impacts above shoreline. The exception is small areas used in recent CAC
exploration activities for access and drill and blast tests. Equipment traffic did produce observable compaction of topsoil in work pad areas; this compaction was not judged as detrimental to productivity. The temporary access trail up the slope from the beach had obvious soil movement, but soil cover left upon egress appeared adequate to prevent delivery to open waters. Blast sites obliterated the overburden soils in two relatively small areas, one in each of the two quarries and estimated to be approximately two acres each.

Environmental Effects

Measurement Indicators
Policy outlined in the Forest Service Manual (FSM) provides standard measures for soil quality management emphasize minimizing detrimental soil disturbance in the forms of erosion, compaction, displacement, puddling, altered wetness, and mass movement, as well as maintaining effective and uniform ground cover. All of these indicators are measurable in severity and/or extent. Any or all of these disturbances in combination should not exceed 15% area to maintain soil productivity.

Soil quality management and subsurface development cannot occur concurrently, as stipulated in the FSM. Therefore the above soil quality indicators are applicable sequentially, before quarrying and post-reclamation. These indicators are used in this report as context to describe expected impacts; they are not analyzed to compare alternatives because they do not actually apply.

It is assumed that application of required Best Management Practices (BMPs), as well as Project Design Criteria (below), concurrent with the project will minimize erosion and maximize the conservation (salvage) of soil materials. Erosion prevention is an end-result objective; it is assumed that any necessary additional or corrective actions will be implemented, as negotiated between CAC and the Forest Service, to achieve this end-result.

Alternative 1—No Action

Direct and Indirect Effects
Direct effects of No-Action would be to contain soil impacts to only those resulting from CAC Exploration (current condition). Access trails currently have observed compaction that was not judged as detrimental to productivity; trails are currently stable in terms of erosion potential, and will only improve as revegetation progresses. These trails occupy a very small portion of the analysis area (approx. 1.25 acres or 3%). Test drilling sites have very minor impacts currently; they are nearly unnoticeable due to the drill rig being air-lifted in place. Test blasting sites have complete soil obliteration (absence) and exposed granitic bedrock; bedrock is stable and soil impacts are an irretrievable and irrecoverable loss. Test blasting sites occupy a small portion of the analysis area (< 5%), and would not be further enlarged with No-Action. No mitigation or reclamation or restoration activities would be necessary with No-Action.

Cumulative Effects
There would be no additional impacts with No-Action, so there would be no additive effects of other past, present and reasonably foreseeable future actions, and therefore by definition no cumulative effects.

Alternative 2—Proposed Action
Environmental effects are analyzed with the assumption that BMPs and the stipulations included in Appendix B are effectively applied to the proposed action.
**Direct and Indirect Effects**

Soils will be displaced from the entire quarry areas (approximately 45 acres) and stockpiled for future reclamation purposes. Mineral and organic soil horizons will be excavated, mixed, and homogenized through salvage and reapplication activities. Mixing and decomposition of organics in the (mainly) sandy loam and loamy sand will somewhat enrich the stockpiled soils and conserve site nutrients. These materials will be spread back over the site during reclamation.

Most soils will not be removed from workpads. All of these areas (approximately 28 acres) will see intensive heavy equipment traffic and compaction of soils will be unavoidable and detrimental. To minimize erosion and other soil impacts, soils stipulations include minimizing traffic when possible and retaining soils. Reclamation should involve removal of the majority of surface rock followed by decompaction to promote infiltration and revegetation.

The laydown pad and roads (4.5 and 10 acres, respectively) will also be heavily and repeatedly trafficked. Soils stipulations will help mitigate subsurface compaction to some extent. These areas will also be relatively impervious and prone to producing runoff; drainage features are required to control runoff and avoid adverse impacts. Reclamation should involve decompaction and re-contouring to the approximate original terrain.

Other effects of the proposed action would be increased surface runoff throughout the project area, because of impervious and/or heavily compacted surface conditions. Sediment settling ponds will be constructed to minimize off-site impacts. Additional erosion control features for the laydown pad and connected access road, as included in Appendix B, are required to avoid scour and erosion.

These impacts would not occur all at once; they would be spread out through the life of the project. Reclamation would be done as portions of quarry development work are completed, which would likely be annually in active-quarry years. Thus the acreage extent of impacts at any one time would be annually variable over the life of the project.

In summary, unavoidable adverse soil impacts will occur over the entire project area. Reclamation activities will help to restore some of these impacts. Soil drainage and productivity will be altered. Reclamation activities are legally sufficient to rehabilitate site impacts.

**Cumulative Effects**

The relatively minor impacts of the CAC Exploration activities will be entirely superimposed by the more intensive quarry activities once the quarry is operational, so current impacts from these recent past activities would occur in the same footprint. The proposed CAC Development for purposes here is considered the “present” action even though large portions of the activities will occur over the future couple decades. There are no known additional future activities planned or foreseen beyond the quarry development project (including reclamation). Thus there are no additive effects of past, present, and reasonably foreseeable future actions, and therefore by definition no cumulative effects.

**Statutory and Regulatory Consistency**

The alternatives are consistent with applicable regulatory framework. There is a noted discrepancy between soil quality management objectives and mineral development: soil quality standards (SQS) are intended to comply with NFMA for multiple use and sustained yield of renewable resources; minerals are not considered a renewable resource and are not subject to these standards. SQS indicators were used merely as context to describe the extent and magnitude of expected soil impacts, spatially and temporally.
Both alternatives are in compliance with the Chugach NF Revised LRMP through application of relevant Best Management Practices specified in the Soil and Water Conservation Handbook (R-10 2509.22-2006-2). The No-Action alternative complies with Management Area 221 direction for EVOS fee lands. Alternative 2 would comply with Management Area 551 Direction, provided that quarrying activities are limited to the area necessary and are carried out so that effects on other resources are minimized, and all required stipulations are met.

Alternative 2 involves adverse environmental effects that cannot be avoided or mitigated. Soil disturbance will be severe and long lasting, constituting substantial and permanent impairment of soil productivity within the project area with respect to NFMA and Forest Service soil quality standards. Reclamation will only partially restore functioning condition of soils, and soil productivity will remain adversely affected. This is legally permissible, but must be disclosed.

**Plants**

**Summary of Effects**

**Sensitive Plants:** No sensitive plants or plant populations were found during a survey of the project area (in project record). There are no known sensitive plant populations in Port Gravina though suitable habitat exists for several Alaska Region sensitive plant species in the project area. The likelihood of these species occurring in the project area is low. The determination is that individual plants, if they did occur, may be adversely impacted, but implementation of this project is not likely to result in a loss of viability in the project area, nor cause a trend toward federal listing.

**Invasive Plants:** Implementation of quarry development activities would likely result in an increase in susceptibility of the site to invasive plant introduction and establishment. Once established, invasive plants can spread beyond the project site into neighboring native plant communities. Stipulation 13 (Appendix B) has been included to reduce the introduction and spread of invasive plant species into the project area and surrounding lands.

**Analysis Area**

The geographic area of analysis used to assess impacts to plants is the project area, which encompasses all ground disturbance associated with the mining activity. The timeframe for the analysis includes the life of the project and up to five years after to monitor for invasive plants.

**Existing Condition**

**Sensitive Plants:** A pre-field review of existing information concerning Forest Service Region 10 sensitive plants was conducted on August 19, 2014 for two exploratory sites and determined that suitable habitat exists for eight sensitive plants within the project area. The following general habitats occur in the project area: coniferous forest, forest edge, beach/forest ecotone, tall shrublands, low shrublands, rocky areas, rock outcrops, wet areas, riparian areas, shallow freshwater, maritime beaches and sandy areas. Potential habitat occurs within the project area for the following sensitive plant species:

- *Botrychium spathulatum*, *Botrychium tunux*, and *Botrychium yaaxudakeit* (moonworts)
- *Cypripedium guttatum* (spotted lady’s slipper)
- *Cypripedium parviflorum* var. *pubescens* (large yellow lady’s slipper)
- *Lobaria amplissima* (lichen)
- *Piperia unalaschensis* (Alaska rein orchid)
• *Romanzoffia unalaschensis* (Unalaska mist-maid)

A rare plant survey was conducted for the project on June 24, 2015 to document the existing condition. The survey was conducted at an intensity level 5 where the surveyor has a closer look by conducting a complete examination of specific areas of the project after walking through the project area and perimeter or by walking more than once through the area. A detailed map showing the exact route that the botanist travelled on the ground is in the file for this project. No sensitive plants were located within areas likely to be affected by project activities.

**Invasive Plants:** Although no specific survey was conducted for invasive plants, there were none noted during other plant surveys of the area. Therefore, no invasive plant species are likely present in the project area.

**Environmental Effects**

**Alternative 1 – No Action**

**Sensitive Plants**

*Direct and Indirect Effects*

There are no new developments under the No Action alternative; existing potential habitat as well as any unknown populations of the eight Region 10 sensitive species would remain intact. Therefore, the No Action alternative would have no effect to these eight species or their habitat.

*Cumulative Effects*

Because there are no direct or indirect effects from the No Action alternative, there would be no cumulative effects.

**Invasive Plants**

*Direct and Indirect Effects*

Invasive plants are currently absent within the project area. With no new developments under the No Action alternative, the introduction and spread of invasive plants would likely remain at the current slow rate. Therefore, the No Action alternative would have no measureable effect on the introduction and spread of invasive plants.

*Cumulative Effects*

Because there are no direct or indirect effects from the No Action alternative, there would be no cumulative effects.

**Alternative 2—Proposed Action**

**Sensitive Plants**

*Direct and Indirect Effects*

No sensitive plant populations have been found in the project area during the plant survey, however, changes in hydrology via intentional channel shifting or re-route may reduce riparian habitat. In the unlikely event that sensitive plants are located within the area where operations will occur, ground will be disturbed or cleared permanently and there is a potential for impacts to local populations.

A Biological Evaluation for Plants was prepared for this project. Plants documented during the survey are listed on the Plant Survey Field Form and is in the project record. One particular species included on the Plant Survey Field Form is the Oregon crabapple (*Malus fusca*) which was specifically mentioned by an
individual during public scoping. The Oregon crabapple is not a rare species; it is fairly common in eastern Prince William Sound. It appears to be able to withstand disturbance (e.g., intensive timber harvest at Knowles Head).

Indirectly, activities such as site access and trampling with equipment may also indirectly affect sensitive plant habitat through the introduction of invasive plants, which compete with native plants for available habitat and will be discussed in more detail below.

**Cumulative Effects**

There are no cumulative effects because there are no known additional past, present or foreseeable future actions in the analysis area.

**Determination of Effects**

Based on the rationale described above, the alternative courses of action (including Stipulations identified in Appendix B) will result in the following impacts on the sensitive plants.

- May adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing for the following sensitive plant species:
  - *Botrychium spathulatum*, *Botrychium tunux*, and *Botrychium yaaxudakeit*
  - *Cypripedium guttatum*
  - *Cypripedium parviflorum var. pubescens*
  - *Lobaria amplissima*
  - *Piperia unalaschensis*
  - *Romanzoffia unalaschensis*

**Invasive Plants**

**Direct and Indirect Effects**

Initial consequences of mining operations include clearing vegetation, resulting in exposure of bare soil and promoting direct contact of invasive weed vectors such as equipment and materials. The fill material produced by project operations will be set aside for reclamation. The stockpiled soil would consist of rock, soil, organic material that may be exposed to potential invasive plant seed. If contaminated, spreading material throughout project area may increase risk of invasive species colonization.

Activities such as site access and trampling with equipment may also introduce invasive plants, which compete with native plants for available habitat. Invasive plants pose a threat to native plant communities, and have the potential to cause ecological and economic harm. Implementation of the project will result in a disturbance to the ground and native vegetation, which will increase the susceptibility of the site to invasive plant introduction and establishment. Established invasive plant populations can be spread beyond the project site into neighboring native plant communities.

To reduce impacts from invasive plants, Stipulation 13 listed in Appendix B have been included. However, some level of impact resulting from invasive plant species, as described above, would still be expected to occur even with the stipulations. The degree to which the stipulations would reduce impacts is not measurable, but is expected to be fairly substantial based on similar actions in other areas. For example, vehicle washing is a commonly accepted practice in firefighting and burned area restoration because of the effectiveness of reducing introduction of invasive species.
**Cumulative Effects**

Because there are no other activities in the analysis area, there would be no cumulative effects on invasive plants.

**Statutory and Regulatory Consistency**

The project, as proposed, is consistent with the Forest Plan for sensitive and invasive plants. No sensitive plant species were found in the project area, therefore, this project is consistent with the guideline to “Avoid, minimize, or mitigate the effects of human activities in areas containing sensitive plant populations” (pp. 3-27). With regards to invasive plants, this project is consistent with the guideline to “Incorporate exotic plant prevention and control into project planning and design (pp. 3-27). This project is also consistent with Executive Order 13112 (Invasive Plants) by incorporating stipulations designed to reduce the introduction of invasive species.3

**Hydrology**

**Summary of Effects**

The proposed action will have numerous effects on water resources, including increased turbidity and water quality degradation, loss of riparian and wetland habitat and changes in streamflow and hydrologic connectivity. Most of these effects will be constrained to the project footprint of the No-Name Creek drainage and there will be no significant effects at the watershed level.

Increased turbidity and water quality degradation from erosion will likely occur during quarry development. It is anticipated that once the project footprint is constructed and Best Management Practice’s (BMPs) and stipulations are implemented degraded water quality will improve. Wetlands are so extensive in the project area; it is not feasible to avoid all wetlands. Effects to riparian and wetlands from this project, including the filling-in of wetlands from road construction and construction of work pads, camps, docks and the quarry development will likely create a permanent or long term loss of wetlands. The long-term loss of riparian and wetland habitat will be moderate in acreage in the immediate project footprint of the No-Name Creek Drainage (8th level HUC) and minor and negligible in acreage at the Plateau Creek Sub-watershed (7th level HUC) and Port Gravina-Frontal Prince William Sound Watershed (6th level HUC) levels.

This direct disturbance and permanent loss of wetlands within the project footprint will also have moderate long term effects on the hydrologic connectivity and streamflows within the immediate project footprint of the No-Name Creek Drainage. These effects will be minor within the Plateau Creek subwatershed and negligible within the Port Gravina-Frontal Prince William Sound watershed levels.

It is anticipated that post-reclamation natural revegetation will progress gradually over the next several years to decades following project completion.

**Analysis Area**

The water resources analysis area for direct and indirect effects is bound spatially by watershed boundaries. Several watershed level analyses were completed. The watershed scales analyzed included the 6th level Port Gravina-Frontal Prince William Sound level Hydrologic Unit Code (HUC) delineated by the USGS and the 7th level HUC Plateau Creek and 8th level HUC No-Name Creek watersheds delineated utilizing GIS to analyze more local project footprint effects.

The magnitude of effects on the different water resources (water quality, wetlands and riparian habitat, streamflow and hydrologic connectivity) were analyzed at each of these watershed levels. The magnitude
rating was developed/adopted utilizing some of the condition rating rule sets outlined in the Watershed Condition Classification Technical Guide (Potyondy and Geier, 2011). The magnitude of effects were measured/defined as the following:

Negligible- These changes would shave little to no affect (< 1 percent) on water quality, wetlands and riparian habitat, streamflow and/or hydrologic connectivity of the watershed. Minimal to no impairment to beneficial uses of the water bodies in the watershed. Stream hydrographs have no or minor departure from natural conditions.

Minor- These changes would affect less than approximately 20 percent of the streams, riparian and wetland areas within the watershed. Localized incidence of accelerated sediment, nutrients, chemicals or infrequent contamination of water sources. Stream hydrographs in discrete locations have moderate recognized departures from natural conditions part of the year.

Moderate- Evidence of accelerated sediment, nutrients, chemicals or contamination of water sources and loss of riparian and wetland habitat and hydrologic connectivity for approximately 20 to 50 percent of the watershed. Stream hydrographs in areas have recognized departures from natural conditions most of the year.

Major- Evidence of extreme accelerated sediment, nutrients, chemicals or frequent contamination of water sources and loss of riparian and wetland habitat and hydrologic connectivity for more than approximately 50 percent of the watershed. The magnitude, duration and/or timing of annual flows significantly depart from the natural hydrograph for the majority of the watershed.

The analysis is bounded in time by the foreseeable future period during which effects of this project could reasonably detectable. Some water resource impacts such as degraded water quality, can naturally recover once the project footprint in constructed and BMPs are implemented. Others such as loss of wetlands and changes in hydrologic connectivity can persist for decades. In general, effects are discussed as short-term (< 2 years) or long term (> 10 years) effects. The Port Gravina quarry development project is proposed to occur over the next 20 years. It is anticipated that post-reclamation natural revegetation will progress gradually over the next several years to decades following project completion. Thus the length of time effects are considered for impacts is the next 25-40 years. For cumulative effects the project is bounded in time by past, present, and reasonably foreseeable future projects.

**Existing Condition**

The proposed project lies within the 30,173-acre Port Gravina-Frontal Prince William Sound watershed (6th level HUC). The Port Gravina Bay is a large, glacially formed, U-shaped fiord. Steep valley sides lead to elevations up to about 4,000 feet, with the majority of the watershed at elevations between 1,000 and 2,000 feet. Glaciers currently only exist within approximately 1 percent of the Port Gravina–Frontal Prince William Sound watershed; however glacial fed streams outside of the watershed do drain and provide glacial fed waters to the bay.

The project is at elevations of about sea level to 230 feet.

Streams in the immediate proposed project footprint are primarily a small unnamed, uncatalogued anadromous, class I, small moderate gradient mixed control stream channel with sections of high gradient contained low incision referred to as No-Name Creek, and numerous small unmapped ponds and palustrine back water flow/groundwater fed channels. There is minimal channel incision in most of the project vicinity due to the shallow depth to bedrock in most locations. Channel complexity is limited and habitat is predominantly riffles with few pools present. Large woody debris is rarely present or contributing to channel forming features. Bedrock, boulders and wetland morphology form most of the
habitat features present. The majority of the bed of No-Name Creek is gravel-sized material, cobble, and numerous boulders.

Peak flows in the project area are typically generated by summer snowmelt. Snowmelt runoff generally starts in early May, with peak flows averaging about 9 cubic feet per second (cfs) in mid- to late June. Large peak flow events can occur during summer warm spells as well as during heavy fall rainstorms that create short duration, high water events lasting 1 to 3 days. Winter flows from December through April are approximately 2 cfs, as snowpack covers most of the watershed.

All of the waters in the watersheds of the project area meet water quality standards as defined by Alaska Department of Environmental Conservation Water Quality Standards 18 AAC 70 for designated beneficial uses. Beneficial uses within the project area include water supply growth and propagation of fish, shellfish, and other aquatic life. Sediment loads and turbidity are low and generally increase only during high flows, as finer particles become suspended. The sources of sediment naturally delivered to the stream include flooding or bank erosion.

The USFWS wetlands inventory identified 153 acres of wetlands within the No-Name Creek drainage. These wetlands were predominantly mapped as fresh water forested / shrub wetlands with minor acreages associated with estuarine and marine deep water, estuarine and marine, freshwater emergent and freshwater pond wetlands.

Numerous springs are found throughout the watershed, most commonly along lower portions of the valley side slope, below long slopes. Groundwater on the side slopes trickles through the soil layers and the fractured bedrock below, and emerges lower on the slopes. The granite bedrock geology of the area is not porous enough to create significant aquifers. The lack of bedrock porosity also lends for an extremely shallow water table and a significant portion of overlying vegetation characterized as wetland.

**Environmental Effects**

**Alternative 1 – No Action**

**Direct and Indirect Effects**

Under Alternative 1, the No Action Alternative, there would be little to no changes to the No-Name Creek drainage (8th level HUC), Plateau Creek Subwatershed (7th level HUC), or Port Gravina watershed (6th level HUC). Hydrologically, surface water and groundwater quantity and quality would mimic natural physical and biological cycles and retain current levels of high quality and integrity. Wetland and riparian integrity and acreage and stream miles and channel types would remain at current levels with no change.

**Cumulative Effects**

Because there are no direct or indirect effects from the No Action alternative, there would be no cumulative effects.

**Alternative 2—Proposed Action**

**Direct and Indirect Effects**

**Riparian and Wetlands**

Wetlands are so extensive in the Port Gravina project area that it is not feasible to avoid all wetlands. The direct effects to riparian and wetlands from this project include filling-in of wetlands from road construction and construction of work pads, camps, docks and the quarry development which will likely
create a permanent or long-term loss of riparian and wetland habitat. There will be major, direct effects to approximately 49 acres of wetlands from these activities. Other minor to moderate direct effects include potential sedimentation and alteration of wetland/hydrologic connectivity in an additional 74 acres of wetlands within the No-Name Creek drainage. The sedimentation and wetland hydrologic connectivity loss effects will be greatest during project construction, but effects may be long term and last throughout the duration of the project. Best Management Practices and project design should mitigate some of these effects. All of the affected acres will be predominantly freshwater forested / shrub wetlands with a minimal acreage of freshwater emergent and estuarine marine wetlands.

Effects due to the loss of riparian and wetlands were analyzed at the watershed, sub-watershed, and drainage levels. Table 1 displays the potential percentage of wetlands affected and the potential percentage of wetlands lost from development of Alternative 2. The effects at the No-Name Creek drainage level would be moderate in magnitude, minor at the Plateau Creek Subwatershed level and negligible at the Port Gravina-Frontal Prince William Sound Watershed level.

Table 1. Total potential percent of wetland affected and loss under Alternative 2

<table>
<thead>
<tr>
<th>Watershed Level</th>
<th>Approximate Total Potential % Wetland Affected within the Project Area</th>
<th>Approximate Total Potential % Wetland Loss by Disturbance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port Gravina-Frontal Prince William Sound Watershed</td>
<td>1.33</td>
<td>0.45</td>
</tr>
<tr>
<td>Plateau Creek Sub-watershed</td>
<td>15.55</td>
<td>6.14</td>
</tr>
<tr>
<td>No-Name Creek Drainage</td>
<td>56.01</td>
<td>29.70</td>
</tr>
</tbody>
</table>

Channel Types
Affects to stream channel types from this project include permanently diverting approximately 0.5 miles of No-Name Creek to the west and locating it equidistant between the two work pads. The diverted stream would be replaced with a constructed channel with habitat features and material replicating the natural channel, consisting of large boulders and at least one deep pool and riffles. The effects of the diversion on No-Name Creek, the small moderate gradient mixed control and high gradient contained low incision channel types, would be short-term in nature due to the planned construction of the new channel. Sediment from the construction may enter stream channels; fill pools and change channel shape and form.

Alternative 2 includes filling of less than 0.2 miles of a small palustrine back water flow/groundwater fed channel to create a working platform for the East Quarry. Effects to this habitat type would be long term to permanent due to the total loss of the habitat.

Effects to channel types were analyzed at the Watershed, sub-watershed, and drainage levels. The analysis reveals that less than 50 percent of the No-Name drainage and approximately 4 percent of the Plateau Creek sub-watershed stream channel will be affected from development of Alternative 2. Overall, the affects to the different channel types will have negligible affects, less than 1 percent, on the Port Gravina-Frontal Prince William Sound watershed level analysis area.

Surface Hydrology/ Water Quantity
Alternative 2 has the potential to affect surface water run-off and water quantity. Camps, facilities, rock processing and dust abatement will likely withdraw quantities of water from designated sources approved by the State of Alaska with a temporary water use permit. These consumptive water withdrawals have the
potential to decrease the amount of surface water in the watershed. Temporary water use permits to CAC from the State of Alaska includes stipulations for instream flow requirements for No-Name Creek and some water sources to minimize effects. Though these effects will last throughout the extent of operations, they should not be significant.

Additionally, effects to surface hydrology and water quantity will be related to potential increased surface run-off due to the loss of wetlands/storage capacity and the increase in impermeable surfaces such as roads and work pads. The result may be that a larger percentage of rain becomes run-off during any given storm. These changes may have an influence on the size and timing of peak stream flows. Peak discharge floods may be higher for an equivalent rainfall and reach the channel sooner for an equivalent rainfall than prior to development. These effects will be long-term in nature, continuing until reclamation when pads and roads are ripped or removed.

**Groundwater**

Alternative 2 has the potential to affect groundwater quantity in several ways. In areas of loss of wetlands and increased impervious surfaces ground water infiltration will decrease due to increased run-off. In areas of blasting and rock excavation ground water infiltration into bedrock may slightly increase due to increased fracturing of the rock. These effects will not be significant, but will be long-term in nature and last throughout the operation of the quarry and beyond.

**Water Quality**

Alternative 2 has the potential to affect water quality. Water quality may decrease in the project area by the increased potential for chemical pollutants to enter waterways. These chemical pollutants may include oils and lubricants used by vehicles, construction equipment and camp facilities. There is also the potential for water quality degradation to occur from human waste contamination. Additionally, there is potential from water quality degradation from increased turbidity as a result of exposed bare soil, roads, blasting, and erosion. These effects should not be significant since Best Management Practices (BMPs) and Stipulations 9, 10, and 11 found in Appendix B should mitigate these effects. These effects will exist over the duration of the operations.

**Cumulative Effects**

There are no known cumulative effects to consider within the watershed, sub-watershed, or drainage of the project area.

**Statutory and Regulatory Consistency**

Alternative 2 meets most riparian buffer guidelines outlined for the channel types. The 20 foot constructed channel riparian buffer described within the operating plan does not meet Forest Plan guidelines or direction from the Aquatic Habitat Management Handbook (FSH 2090.21.30).

The Minerals Management Area requires mineral activities to be as compatible as possible with other management area direction, but acknowledges that permissible activities may not always be consistent with standards and guidelines (Forest Plan, p. 4-87). Currently, there is little riparian vegetation within the project area with few trees or woody debris within the channels. The reconstructed channel will have a disturbed riparian area. Although a larger buffer is recommended to filter out sediment between the work pad and No-Name Creek, water quality degradation can be avoided by proper design of the work pads so that all contact water drains into stormwater settling ponds, and not directly into the constructed channel.

By following BMPs and using mitigation measures to minimize effects and make the project as compatible as possible with management area direction, this project is consistent with Forest Plan direction.
Fisheries

Summary of Effects
Cutthroat trout (*Oncorhynchus clarkii*) in No-Name Creek are the only population of fish that would be affected by this project. The no action alternative would have no effect on fish or fish habitat. The proposed action would affect this population of cutthroat trout and habitat for the population. The degree of these effects depends on the level of mitigation implemented for the project.

Effects to fish and fish habitat from the proposed action include habitat loss, changes in stream flow, sediment input into the stream, the physical effects of blasting, and the potential for contamination of water by fuel spills or other substances. The existing population of cutthroat trout in this system is small. Alternative 2 will likely kill individual fish and could result in the loss of the entire population of cutthroat trout in this creek.

Effects of the proposed action may be substantial for this small, localized population but should not be significant in terms of populations of cutthroat trout within the context of Prince William Sound or the Chugach National Forest.

This project must obtain and comply with ADF&G and DNR and other permits related to fish habitat, water diversion and other areas that would reduce effects to fish habitat and population (Appendix B). The terms of these permits and plans will ultimately determine the degree of effects to fish in this creek. This analysis discloses the range of potential effects. No effects within this range are expected to be significant based on the context of the project and intensity of the action.

Analysis Area
The area that has the potential to affect fish and fish habitat covers roughly 16 acres within the project area. It includes the main work pad areas along the unnamed creek and the creek downstream from a proposed water source on the main channel. The amount of water taken could affect the stream flows and habitat from this point to the beginning of a high gradient cascade that has no fish habitat.

The east quarry area is included in the analysis area because blasting at this point could affect fish in the stream and surface runoff could potentially enter the stream from the quarry and the eastern work pad. The western boundary includes that area of the work pad and west quarry where stormwater runoff might be expected to drain toward the fish-bearing section of the stream. The remaining areas of the west work pad and west quarry itself are excluded because the runoff is likely to drain away from the creek.

CAC has indicated that the quarry operations will have a 20-year life span. The main effects to fish habitat, however, would occur in the first stages as the work pads, constructed channel, bridges, and roads are put in place. Effects will be analyzed for the lifespan of the project.

The existing condition considers the only past activity in the analysis area—the exploration activities associated with this project. There are no known other past, present or future actions in the analysis area.

Existing Conditions
No-Name Creek is a small unnamed creek with a small population of resident cutthroat trout that bisects the project area. No other fish species are established in this stream. The amount of fish habitat in the stream is limited because of the short length of the creek, channel shape, and low flows. Healthy populations of cutthroat trout are found in a number of streams in eastern Prince William Sound, including on Knowles Head Peninsula, located approximately 10 miles west of the project area, and on Hawkins Island, located approximately 10 miles south of the project area.
Watershed Characteristics and Ecological Processes

No-Name Creek is a 0.8 mile-stream that drains a watershed of 0.25 square mile with a maximum elevation of 720 feet. Annual precipitation is roughly 100 inches with the highest flows coming during the fall storms and the spring snowmelt. The unnamed stream is small, with an estimated annual mean surface runoff of 1.5 cfs, but with higher average peaks in May of 9 cfs and an estimated 100 cfs when flows are at the bankfull stage.

Generally, the topography of the project area and the area farther upstream consists of a series of terraces separated by short, higher gradient slopes. The stream forms wide, relatively flat outwashes on the terraces, connected by steeper, narrow riffles and is shallowly incised so the flow is poorly contained. Downstream from the main work area, the gradient increases to about 20 percent, creating a boulder cascade that empties directly to salt water.

The stream substrate is mostly composed of cobble and small boulders with small amounts of gravel and sand. There is little clay or silt. During habitat surveys it was noted that there was little or no fine sediment in the spawning gravels. The large cobble and boulders in the main channels are probably derived from past glacial action rather than being transported from the hillsides by the small creek. However, the wide gravel bars to the sides suggest that there can be flashy flows transporting and depositing smaller material. When the stream is at the bankfull stage, cobbles and other large material may be transported in constricted areas. Channels may shift within the alluvial areas as material is deposited, but there are no signs of wide-scale erosion that might indicate that the system is highly disturbed or out of equilibrium.

The result of this topography is that the stream is quite shallow in the wider areas, with depths no more than 1 foot at ordinary flows, except where pools have been scoured around boulders. It appears that much of the channel widths are frequently dry or only have water seeping between the substrate.

The existing ecological processes appear to be natural and stable. At the present, there is only some minor, temporary disturbance to vegetation caused by the test drilling. There are no landslides, eroding streambanks, or other evidence of large-scale disturbances.

Existing Fish Habitat

Two fish surveys conducted by the Forest Service and one by the ADF&G Habitat Division found resident (non-anadromous) cutthroat trout in the unnamed creek. One survey conducted by the Forest Service resulted in the capture of nine cutthroat trout, another captured four individuals. The low capture rates suggest that the fish population in the creek is low. One juvenile coho salmon (*O. kisutch*) was captured in August 2014, but no others have been found. It is believed that the juvenile salmon came from the adjacent Plateau Creek system, through the estuary, and somehow managed to swim up a boulder-filled cascade that is too shallow for adult salmon to pass. Given the lack of salmon habitat and the cascade, No-Name Creek is not thought to have an established coho salmon population. ADF&G does not include streams in its Anadromous Waters Catalog where only a single salmon has been captured. No other fish species have been found, therefore this description will only address cutthroat trout habitat.

Environmental Effects

Measurement Indicators

Alternative 1—No Action

The no action alternative would have no effect on fish or fish habitat. There would be no effects from changes in flow levels or patterns, and no effects from blasting. The preliminary test drilling and the
access trail have caused vegetation and soil disturbance but there is no sign of erosion or gully formation. If the proposed project is not implemented, reclamation of the test blast sites should be completed.

**Cumulative Effects**
Because there are no direct or indirect effects from the No Action alternative, there would be no cumulative effects.

**Alternative 2—Proposed Action**

**Stipulations and monitoring**
Any water use is regulated by the Alaska Department of Natural Resources (DNR), Division of Mining, Land, and Water. Minimum instream flow requirements and maximum water use will be regulated with a Water Use Authorization. Minimum flows requirements will be reviewed and established in regard to the design of the constructed channel to ensure that there is sufficient depth for fish habitat and channel connectivity for fish migration. This, proposed additional stipulations, and other permits and plans that are required for this project are listed in Appendix B.

**Direct and Indirect Effects**

**Habitat Loss, Dewatering of Habitat**
To provide additional working area for the quarry operations CAC proposes to divert 1377 feet of stream channel through an artificial channel farther to the west. Work pads would be constructed over the existing creek channel and riparian areas.

The section of stream that would be diverted is 40 percent of the total stream length that is usable as fish habitat. It contains all of the known cutthroat trout spawning area and 25 percent of the pool habitat. The pools provide important winter habitat when flows are reduced. Areas upstream of the diversion point provide some habitat, but the stream becomes smaller and increasingly intermittent at low flows.

Any fish remaining in the dewatered section stream after the flow is diverted are likely to die. Although no population estimates are available, the fish trapping surveys conducted by Forest Service personnel suggests that the population is small. The loss of approximately 40 percent of the usable stream length is expected to have an adverse effect on the population because all of the spawning habitat and much of the pool area is located in this section of the stream.

Direct mortality of fish from dewatering habitat can be lessened by removing fish prior to shifting the flow to the constructed channel, but it is acknowledged that it is unlikely to save all of the fish.

A gradual flow reduction in the natural channel may allow fish to find deeper water where it may be easier to trap them. The fish might also migrate downstream to the section of the existing channel that will not be dewatered. The diversion should occur in late summer or fall so developing eggs in the gravel are not dewatered.

The diversion of the stream will result in the loss of spawning habitat and a portion of the population. The population in the unnamed stream would continue to decrease over time, due to loss of spawning habitat. If the newly constructed channel was built to include features that provide adequate spawning habitat (see stipulations in Appendix B), the population could recover and there would be no long-term effect to the population from this action.
Changes in Flow

The effects of changes in flow volume in the stream are dependent on the amount of water that is withdrawn from the main channel and the amount of runoff water from the work pads that is diverted to the sediment ponds.

The effects to fish and fish habitat would occur if the flow in the channel is reduced to the point where habitat is dewatered. This occurs naturally to some extent – the stream channel widens considerably, becoming shallower and more prone to subsurface flow in the alluvial areas. Upstream of the work area, the stream becomes intermittent at low water. If water levels vary from frequent withdrawals, fish may be trapped in areas that dry up. If the stream becomes intermittent, fish may be unable to migrate to spawning areas or safe winter habitat areas. Developing eggs in the gravels could become dewatered and die, however, cutthroat trout lay eggs in May when water levels are generally higher from snowmelt.

If any water withdrawal is necessary for the project, and the water is taken from the isolated ponds in the area, from wells away from the stream, or from the farthest downstream location, there would be no effect to fish or fish habitat. The ponds identified as possible water sources for camp use are located in a different drainage, so pumping water in those locations is not expected to have an effect on stream levels in the unnamed creek.

An Alaska DNR water use authorization should ensure that adequate flows are maintained to keep fish habitat watered and allow fish migration. If minimum flows are established and maintained, there will be no effects to fish and fish habitat.

Sediment Input to the Stream

The proposed action will include soil disturbance primarily from the clearing of area for work pads, digging the diversion channel, and the development of the quarries. Fine sediment from the disturbed soil can be carried into the stream by surface runoff, road ditches, and eroding streambanks of the constructed channel. Sediment can also come from fine material that cannot be removed from the constructed channel and material that is being naturally transported by the stream from upstream sources. Fine sediment and larger material can fill pools needed for winter habitat. Fine sediment can also fill the interstitial spaces between spawning gravels, negatively affecting egg development and survival.

There is natural transport of material from upstream areas that could fill the constructed channel and fish habitat. Transport of fine sediments remaining in the constructed channel after completion could also be carried to a large downstream pool that provides 72 percent of the winter habitat in the current stream channel.

No-Name Creek currently transports and deposits material in the area identified to construct the proposed work pad. It is not known how frequently there are storm events and high flows that can transport large amounts of material or the larger size classes. There may be the potential for such events over the projected 20-year span of this project. After the stream is diverted, this material could potentially fill the constructed channel causing flooding of the work area, erosion and sedimentation, and the loss of fish habitat. Maintaining a large, deep pool to capture transported material could prevent these problems.

Some transport of the fine sediments remaining in the constructed channel is inevitable, but the amount is hard to determine. The amount transported to downstream pool habitat could be minimized by stipulations that would minimize sediment from the banks of the channel during construction using silt fences or other physical barriers.

Fine sediment in the channel will cause some turbidity when flows begin, but it is not expected to last for an extended period of time. The natural stream channel contains limited amounts of fine sediments. The
material excavated for the channel is not expected to contain high amounts of fine particles that would continue to cause turbidity.

The proposed plan to construct berms to divert surface runoff and revegetate exposed soils should minimize effects to fish or fish habitat by limiting sediment input to the stream. Implementing measures to minimize sediment input to the diversion channel during construction will limit turbidity effects to downstream pool habitat.

**Blasting**

The effects of blasting depend on the weight of the charges, distance from the stream, and the site specific topography where the charges are placed. Recent fish research and new Alaska Department of Fish and Game Habitat Division standards for blasting near fish bearing streams have recommended buffers and other measures to minimize or prevent effects to fish. Proposed blasting should occur farther than 250 feet from most sections of the creek. Based on topography and recent ADF&G standards, effects on fish and embryos from blasting should be minimal.

**Conclusion:** The range of possible effects on fish habitat and the small population of cutthroat trout in No-Name Creek vary greatly, depending on the terms of final stipulations and details of the numerous permits CAC must obtain prior to project implementation. In the worst case scenario, the small population of trout in No-Name Creek could be killed. In the best case scenario, a portion of the population could remain. The required permits should minimize effects to fish and habitat. Even if the localized population is eliminated, it is not expected to have an impact on the overall population of this species in Prince William Sound or the Chugach National Forest.

**Cumulative Effects**

Because there have been little, if any natural or human disturbances in the area and no other development in the future is foreseen, there will be no cumulative effects.

**Statutory and Regulatory Consistency**

The Forest Plan provides only one guideline for activities in streams and riparian habitats (Forest Plan p. 3-23). The guideline directs planners to follow the directives in the Aquatic Ecosystem Management Handbook for the different stream process groups and their riparian areas. The directives, objectives, and desired conditions for the channel process groups found in the analysis area emphasize maintaining natural flows and riparian vegetation. The Minerals Management Area requires mineral activities to be as compatible as possible with other management area direction (Forest Plan, p. 4-87). Diverting the stream and building work pads over the existing riparian areas will interrupt the natural flows and riparian vegetation, which is inconsistent with the guideline on page 3-23, but recommended mitigation measures are intended to minimize effects to the extent possible. Thus, thought the project is not consistent with the guideline itself, this project is consistent with Forest Plan direction for the Minerals Management Area.

**Wildlife**

**Summary of Effects**

Effects on wildlife from the project include disturbance and displacement of wildlife, possible pollution of wildlife habitat, timber removal, and habitat fragmentation. Most of the wildlife species reviewed for this analysis will not be affected by the project. However, some species may be affected including bald eagles, black and brown bears, marine mammals (such as humpback whales and Steller sea lions), dusky Canada geese, and black oystercatchers. Effects to these species are considered negligible or minor.
minor impact equates to a “not likely to adversely affect” determination for threatened and endangered species and the “may impact individuals but not likely to cause a trend toward federal listing or a loss of viability” determination for sensitive species. Effects are considered minor for dusky Canada geese, black oystercatchers, the western toad and marine mammals. Definitions for and more details regarding these effects are in the combined Biological Assessment/Biological Evaluation/Wildlife Report in the project record.

This project meets the requirements of section 7(a)(2) of the federal Endangered Species Act (ESA) of 1973, as amended (16 United States Code [U.S.C.] 1531 et seq.) which requires federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any listed species, or result in the adverse modification of critical habitat. This project is consistent with the National Forest Management Act (NFMA) (Section 36 Code of Federal Register [CFR] 219.19) which requires that the Forest Service manages fish and wildlife habitat to maintain viable populations of existing native and desired non-native vertebrate species in the planning area and ensures that its actions do not contribute to trends toward federal listing. With inclusion of the wildlife stipulations in Appendix B, this project is consistent with the Forest Plan.

**Analysis Area**

Direct, indirect, and cumulative effects are analyzed at the project area level. The analysis will also consider surrounding waterbodies and adjacent Forest Service lands to allow boat traffic and sound dispersal to be analyzed for a variety of wildlife species over time. A map of the expanded area is included in the wildlife specialist report in the project record. This analysis considers potential effects on wildlife species and habitat found within the project area over the approximate duration of the proposed project (20 years) because effects are tied primarily to human activity and presence within the project and surrounding area.

**Existing Condition**

The existing condition includes exploratory work by CAC completed in 2015. Exploratory activities involved construction of an access route from Secret Cove to the drilling/blasting locations and clearing of trees and brush along access routes.

**Environmental Effects**

**Alternative 1 – No Action**

**Direct and Indirect Effects**

The no action alternative would not introduce additional activities or disturbance in the project area. Mineral exploration activities were completed in the spring of 2015. If no additional action was to occur, supplies staged on CAC lands would be removed and additional reclamation would occur at the two quarry sites. Additional displacement or disturbance to wildlife species may occur during this process but would not be associated with the no action alternative.

**Cumulative Effects**

Because there are no direct or indirect effects from the No Action alternative, there would be no cumulative effects.
Alternative 2—Proposed Action

Direct and Indirect Effects

Implementation of Alternative 2 will result in an increase in human activity (approximately 20 people in the project area), boat and air traffic, and construction activities (i.e. roads, bridges, docks). Construction of facilities, such as camps and roads necessary for the exploration, extraction, and processing of resources, will reduce availability of habitats used by wildlife species. The presence of motor vehicles and people may disrupt the normal feeding and movement activities of wildlife, which could affect the overall health of individual animals.

Most of the wildlife species reviewed for this analysis would not be affected by the project. Species that may be affected include bald eagles, black and brown bears, migratory birds, marine mammals (such as humpback whales and Steller sea lions), dusky Canada geese, the western toad and black oystercatchers. More detailed analyses for individual species is in the wildlife specialist report in the project file. Summaries for species that may potentially be affected are included in this report.

Minor effects on bald eagles may occur due to the proximity of the project area to four known nesting sites, the potential for individuals to change nesting and roosting locations, and the potential for food contamination to occur. Stipulation 16, which requires compliance with an MOU with the US Fish and Wildlife Service, would minimize potential effects to nesting bald eagles. Bald eagle habitat exists adjacent to the project area, which provides nesting opportunities nearby. It is not expected that this project would result in a decrease in population trends for bald eagles.

Brown and black bears utilize salmon streams and salmon spawning areas in subalpine and intertidal zones found adjacent to the project area. An increase in the number of people in the area will likely lead to an increase in conflicts between people and bears. This could result in the death of individual animals, which may affect local populations in the Port Gravina area. Stipulation 15, which requires proper storage of food and garbage, should help reduce habituation of bears to humans. Minor effects on individual bears may also occur due to habitat fragmentation and displacement of individuals from the area. While it is possible that this project may affect some individual bears, it is not expected to affect population trends for brown or black bears within the context of Prince William Sound or the Chugach National Forest. Stipulation 14, which prohibits the sport harvest of some species, including brown and black bears, by project employees while stationed onsite, would help reduce these potential impacts.

If trees are cut and removed during breeding season, effects to migratory birds are minor. This could remove potential and established nest and roosting sites. However, additional habitat is available in adjacent areas, which would prevent any decreases in population trends to migratory birds.

Alternative 2 occurs outside of known dusky Canada goose breeding areas. However, increased human presence and activity during goose hunting seasons may put additional pressure on dusky Canada goose harvest. Since large concentrations of dusky Canada geese are not known to occur in this area, few individuals, if any, would be exposed to risks associated with Alternative 2. Therefore, the project would have minor impacts to dusky Canada goose.

Marine mammals (sea otters, humpback whales, Steller sea lions, harbor seal, Dall’s porpoise) are frequently observed in the vicinity of the project area and are likely to incur minor effects due to increased boat/barge traffic, dock construction, vessel strikes (low risk), and water pollutants. These activities may displace marine mammals but will not adversely affect their populations.

Accumulation of pollutant concentrations (blasting and petroleum products) in water or in the soil or sediments could contaminate food sources, decrease habitat health, increase disease, and ultimately affect wildlife populations. Compliance with the permits and plans listed in Appendix B should reduce the risk.
of contaminants in the soil or water. Ponds in the project area in which the western toad breeds could be affected, but this project is not expected to affect the current population trend for this species in the context of Prince William Sound or the Chugach National Forest.

Increases in noise and general disturbance to black oystercatchers related to increased barge traffic and dock construction in the Port Gravina area; increased human presence and activity; and water pollution may adversely impact individuals, but is not likely to result in a loss of viability in the project area, nor cause a trend toward federal listing for this species.

Vessel activity in Port Gravina associated with this project will be a potential source of disturbance to wildlife species. Oil or fuel spills due to the vessel activity at the proposed dock and elsewhere in Port Gravina could impact nesting and foraging habitats of wildlife species in the marine and adjacent intertidal habitats. Spill control plans and rapid response to spills are primary measures to avoid or minimize adverse effects to the marine environment (Appendix B).

Cumulative Effects

Other than occasional recreational or subsistence visits to the area, no additional activities are known or anticipated within the project area. Vessel activities (other than those associated with this project) in Port Gravina are expected to continue. These activities are not expected to have measurable effects to wildlife. Thus, no cumulative effects are expected for this project when combined with other past, present or reasonably foreseeable future activities.

Statutory and Regulatory Consistency

Raptor Nest Protection Management:
Bald eagle nest protection standards are outlined in the 2002 Forest Plan. A minimum of a 330-foot zone must be retained around known eagle nest locations. The active bald eagle nesting season is generally from March 1 to August 31. Stipulation 16 in Appendix B requires that bald eagle nest protection standards be followed.

Standards for Threatened and Endangered Species:
The project must comply with requirements of the Endangered Species Act, Marine Mammal Protection Act and their implementing regulations as well as other applicable federal and state laws and Forest Service Policy (FSM 2670 and see Appendix B). There are no T&E species located within Forest Service lands of the project area. Informal consultation is occurring with USFWS and NMFS to ensure no impacts to threatened or endangered species. As this is a unique situation where CAC owns the subsurface mineral estate rights, separate consultation and analysis associated with marine mammals and the Marine Mammal Protection Act will be addressed in a Biological Assessment that will be completed by the Army Corps of Engineers. Consultation measures stipulated by either the USFWS or NMFS must be followed.

Subsistence

Summary of Effects
A potential effect of the proposed CAC Port Gravina Quarry Project to subsistence resources and uses is harvest of wildlife by up to 20 project employees that would be living in the area for a portion of the year. In order to reduce effects to subsistence resources, the Forest Service has proposed to include Stipulation 14, which states that the sport harvest of mountain goats, black and brown bears on Chugach National Forest lands in Port Gravina by employees of the project operation is prohibited.
Many of the resources identified as important to subsistence users in Prince William Sound are generally abundant, with no outstanding concentrations of them near the project area that would motivate rural residents to travel relatively long distances to harvest them.

Mountain Goats and Black Bears, however, are an exception to this assumption and have the potential to be negatively affected by the CAC Port Gravina Quarry Project, if the project employees were to harvest these species.

Although current harvest levels of Mountain Goats within RG242 allow for additional harvest, if additional harvest is concentrated near the project area, the Mountain Goat population surrounding Port Gravina could be negatively affected.

Black Bear harvest data indicate a population decline throughout Prince William Sound, including eastern Prince William Sound where the project is located. Additional harvest of Black Bears by project workers could slow recovery this population in eastern Prince William Sound.

**Analysis Area**

Eastern Prince William Sound, including the eastern portion of Game Management Unit 6D, will be used as the area for analyzing the effects of this project to subsistence uses of fish and wildlife. The analysis will be for the length of the proposed quarrying activity and reclamation.

**Existing Condition**

Mountain goats occur throughout the coastal Chugach Mountains, including mountains near the project area. Rural residents of Unit 6C and 6D have a Customary and Traditional Use Determination for Mountain Goats in Unit 6D in Federal subsistence hunting regulations. Unless project workers are already rural residents of Units 6C or 6D (residents of Cordova, Tatitlek, Chenega, or Whittier) they would not qualify to hunt mountain goats under Federal regulations. The subsistence quota for subarea RG242 and the goat hunt unit that includes the project area is just two mountain goats. The Federal season for mountain goats runs from August 20 through January 31 while the state season runs from September 15-January 31.

The state harvest quota for mountain goats in this same area is much higher, averaging 28 goat units over the past 5 years. Over the same time period, 11 goats were harvested per year, on average, leaving quota available to accommodate additional harvest. However, the majority of harvest over the same time period has been taken near the Port Gravina Quarry site (Sheep Bay through Port Gravina). Harvest from project workers would be concentrated near the project area, rather than be dispersed be throughout RG242, which occupies a large geographic area from Nelson Bay and Port Fidalgo. This would be detrimental to the mountain goat population surrounding Port Gravina. Additionally, the area adjacent to the project site has the lowest mountain goat density within the hunting unit. Since 1996, minimum counts of mountain goats from infrequent survey efforts in RG242 have indicated a relatively stable population.

Black bears occur throughout most of Prince William Sound, with the exception of Hawkins, Hinchinbrook, and Montague Islands, which host only brown bears (*Ursus arctos*), and some smaller islands such as Green and Naked Islands, which have no bears. Rural residents of Units 6C and 6D, with the exception of Whitter, have a Customary and Traditional Use Determination for Black Bears in Unit 6D in Federal subsistence regulations. The Federal season for black bears runs from September 1 through June 30 while the state season runs from September 10 through June 10. Black bears are considered a trophy animal by many hunters and are targeted by many outfitters/guides. The lands surrounding Port Gravina are a popular black bear hunting destination for outfitter/guides under special use permits by the Chugach National Forest.
Black bear harvest data indicate a population decline throughout Prince William Sound since 2007. Reported harvest declined from over 500 bears sealed in 2007 to less than 100 bears in 2015. Western Prince William Sound accounts for the majority of this decline, because densities of black bears are highest in the western Sound and harvest is concentrated near the ports of Whittier and Valdez. While the magnitude of the decline is not as great in eastern Prince William Sound, the pattern is similar: reported harvest declined from 135 bears sealed in 2007 to 55 bears in 2013, and the composition of females in the harvest (a negative characteristic of bear harvest) increased from 30 percent to 50 percent during the same period. In response, ADF&G has reduced the season duration starting in 2015.

Environmental Effects

Alternative 1 – No Action

Direct and Indirect Effects
The effects to subsistence uses being addressed by this analysis, largely the harvest of natural resources by to 20 seasonal residents at the Port Gravina Quarry, would not occur under the no action alternative. Therefore, no increases in the State managed harvest of Mountain Goats would be anticipated. The Mountain Goat population within RG242 would continue to be stable, including within the Port Gravina area.

The Black Bear population in eastern Prince William Sound could recover if the harvest levels are adjusted to accommodate bear population levels, changes in climate, and other factors.

Cumulative Effects
Because there are no direct or indirect effects from the No Action alternative, there would be no cumulative effects.

Alternative 2—Proposed Action

Direct and Indirect Effects
The potential effects to subsistence uses are due largely to the harvest of mountain goats and bears by up to 20 seasonal residents at the CAC Port Gravina Quarry Project. This additional harvest could negatively affect the populations of mountain goats within RG242 and on black bears in eastern Prince William Sound. In order to reduce these effects Stipulation 14 has been included, which states that the sport harvest of mountain goats, black bears, and brown bears on Chugach National Forest lands in Port Gravina by employees of the project operation is prohibited.

While there is opportunity to harvest additional mountain goats under State hunting regulations within RG242, Stipulation 14 would reduce chances of harvest increase occurring within Port Gravina, which may have locally depressed the population.

Without this stipulation the black bear population in eastern Prince William Sound would be exposed to higher harvest levels from residents of the CAC Port Gravina Quarry Project. This additional harvest would be additive to existing harvest levels which appear to have been excessive since 2007. Displacement from salmon resources within streams near the project area could place additional stress on black bears in eastern Prince William Sound.

A temporary closure of the area immediately surrounding the quarrying site is recommended to protect the public, including subsistence users, from safety hazards associated with active quarrying operations. A closure order for safety would reduce the availability of about 239 acres of National Forest System lands.
An ANILCA 810 hearing would be held to evaluate the effects of the closure on Federal subsistence users.

**Cumulative Effects**
There are no known additional past, present or foreseeable future actions in the analysis area and therefore no cumulative effects.

**Statutory and Regulatory Consistency**
This project is compliant with ANILCA Section 810 with a finding that “no reasonably foreseeable and significant decrease in the abundance of harvestable resources, no reasonably foreseeable alteration in the distribution of harvestable resources and no reasonably foreseeable limitations on harvester access have been forecasted to emerge as a function of the (action) that is analyzed in this document.”

**Timber**

**Summary of Effects**
The extraction of granite from the two quarry sites will cause a loss of forest vegetation cover of approximately 60 acres. The value of the timber is low. Twenty acres of saw log sized trees will be cut down during project implementation. The remaining 40 acres is small scrubby vegetation of little economic value.

Impacts will be mitigated with the use of best management practices and with stipulations in the reclamation plan (Appendix B).

**Analysis Area**
The geographic area of analysis used to assess impacts to timber is the project area. This area encompasses all ground disturbance associated with the project. The timeframe for the analysis includes the life of the project and up to five years after to ensure adequate revegetation of the site.

**Existing Condition**
The vegetation varies across the project area. Along the coastal fringe, site conditions are more favorable for tree growth. This area consists of dense Sitka spruce (*Picea sitchensis*) and western hemlock (*Tsuga heterophylla*) with a thick understory of menziezia and blueberry. Not far from the coastal fringe, the main tree species transition from western hemlock into mountain hemlock (*Tsuga mertensiana*). These areas are a mosaic of wet muskeg and associated vegetation with stunted mountain hemlock and areas of larger, dense mountain hemlock. Soils are relatively thin over granite with poor drainage, which drive vegetation patterns.

**Environmental Effects**

**Alternative 1 – No Action**

**Direct and Indirect Effects**
Under the no action alternative all the existing timber at this site would remain uncut in the current condition.
Cumulative Effects
Because there are no direct or indirect effects from the No Action alternative, there would be no cumulative effects.

Alternative 2—Proposed Action

Direct and Indirect Effects
For this project approximately 100 acres of NFS lands would be directly disturbed. Forest vegetation cover would be lost on approximately 60 of these acres. Sitka spruce, western and mountain hemlock would be removed and kept for reclamation or utilized as part of the project. Soils would be excavated and stockpiled for reclamation. After the project is complete, stockpiled soil and remaining trees would be spread over developed areas encouraging natural vegetation to establish (see Reclamation stipulations in Appendix B). Areas of exposed rock would likely remain with natural processes driving succession and revegetation, which would occur slowly over time.

Cumulative Effects
There are no known additional past, present or foreseeable future actions in the analysis area and thus no cumulative effects.

Statutory and Regulatory Consistency
The project area is in the EVOS, Acquired Lands Management Area, described in the Forest Plan. The Forest Plan allows for the removal or harvesting of timber or other forest except for subsistence uses or for the purpose of access, exploration, and development of the subsurface estate. Quarry operations would fall into the exception for the removal/harvesting of forest products.

Heritage Resources

Summary of Effects
Two historic properties were documented and determined eligible for inclusion in the National Register of Historic Places (NRHP). They will not be adversely impacted by project activities. One isolated feature is determined not eligible for inclusion in the NRHP under any criterion. The isolated feature is within the proposed lay-down area and will be adversely affected by project activities. On February 11, 2016, the Alaska State Historic Preservation Office (SHPO) provided written concurrence to the Forest Service that the recommended determination of a finding of no historic properties affected is appropriate for the proposed action.

Analysis Area
The analysis area for direct, indirect and cumulative effects is the area in which proposed ground-disturbing activities will occur, because these activities could impact heritage resources. The temporal scope for effects analysis includes any activities that could have impacted this ground in the past, since indigenous peoples inhabited the area, through the foreseeable future when other ground-disturbing activities could occur and thus impact resources.

Past actions with the potential to effect known resources is limited to historic human use of the area. As identified during the 2015 Inventory, historic use of the area occurred in the form of small-scale logging of the area. The effects of these activities on cultural resources is unknown, and not evident in analysis of known sites within the project area.
**Existing Condition**

A pre-field literature search in 2014 indicated that there had been no previous cultural resource inventories conducted within the analysis area. Cabin ruins and another unknown site had been reported in the vicinity in 1976 and 1980 but no evidence was observed after a thorough scrutiny of the area, beyond a few more recent saw cut stumps.

Cultural resource inventories and subsurface testing occurred over two field seasons (2014 and 2015) with a total of about 24 acres inventoried for cultural resources. Field work was guided by the programmatic agreement between the Forest and the SHPO. Two groves of Culturally Modified Trees (CMTs) were identified and documented by the project archaeologist. The groves consist of large hemlock trees utilized by indigenous peoples for roof planks and/or other functions that subsequently left uniform scarring still evident on the groves along the coast lines just outside of the area of potential effect. In addition, a single CMT was located in the proposed lay-down area within the area of potential effect. It is conceivable that there were other CMTs in this locale at one time but cut stumps suggest the location has since been logged. The previously identified cabin site and the unknown site were not located during the 2014 or the 2015 reconnaissance.

The two aboriginal sites were determined eligible for inclusion in the NHRP. The isolated CMT was determined as not eligible for inclusion in the NRHP.

**Environmental Effects**

**Alternative 1 – No Action**

*Direct and Indirect Effects*

This alternative includes no ground-disturbing activities; the potential for direct or indirect effects is negligible. There would be no potential for inadvertent discoveries and/or damage and destruction to buried cultural deposits and aboriginal human remains. This alternative would have no direct effect on significant heritage resources and no mitigation or monitoring activities would be necessary. Under the No Action Alternative, natural processes would continue and other activities, such as dispersed recreation would continue.

*Cumulative Effects*

Because there are no direct or indirect effects from the No Action alternative, there would be no cumulative effects.

**Alternative 2 – Proposed Action**

*Direct and Indirect Effects*

Two proposed eligible historic properties are just outside the analysis area and the area of proposed activity. Neither historic property should experience direct effects from project activities. One isolated feature will be directly affected by the project within the lay down area but has been determined to be not eligible for inclusion in the NRHP. Under the implementing regulations (36 CFR 800) for Section 106 of the National Historic Preservation Act (54 USC 306108), sites determined ‘not eligible’ for inclusion in the NRHP may be directly affected once adequately recorded, evaluated, and the SHPO has had adequate opportunity to review the determination regarding the site’s NRHP eligibility. Consultation with SHPO was initiated on January 28, 2016 and concurrence was received on February 11, 2016.

Indirect effects to proposed eligible historic properties could include collection or disturbance of possible artifacts and other archaeological, historical, and paleontological materials by the employees or
contractors on the job site. Direct and indirect effects to heritage resources could be realized throughout the duration of the mineral extraction activities. As new areas are developed, sub-surface resources could be discovered.

*Cumulative Effects*
Passage of NHPA and other laws have greatly reduced the number of impacts from project development and other activities on public lands. However, the potential for adverse effects to these resources remains. Currently the project area is utilized primarily for recreational endeavors. Site visitation levels are unknown, however the 2015 analysis did not produce evidence that these activities or any others were adversely affecting known resources in the project area.

Further, currently unplanned, future development of the proposed project has the potential to adversely affect known and unknown cultural resources in the project area. Project activities have the potential to expose the location of known sites within adjacent areas that could include higher visitor use which in turn could potentially increase areas of trampling, looting activities, and erosion. Projected impacts to cultural resources are minimal due to expectations that known and unknown sites in the area of analysis which are or would be eligible for inclusion in the NRHP are so under criterion (d) for information potential, and can be adequately mitigated as needed under the parameters of the State Protocol Agreement, and through consultation.

*Statutory and Regulatory Consistency*
Per the Forest Plan, heritage resource site surveys were conducted under the guidance that surveys are required for surface or subsurface activities where more than one square meter of ground disturbance is occurring. Since this project falls under that category of more than one square meter, and will incur substantial additional ground disturbance over the life of the permit, the heritage resource surveys were consistent with Forest Plan guidance. Additionally, the Forest Plan provides guidance for heritage resource site surveys to be conducted in areas of known heritage resources and provides guidance for protection of heritage resources. The known eligible heritage sites will be avoided and the known ineligible sites are recommended for interpretive mitigation.

*Recreation*

*Summary of Effects*
Most of the effects from quarrying operations will be limited to the project area. Many of the effects to recreation cannot be minimized or mitigated but are consistent with Mineral Management Area applicable standards, guidelines, and desired conditions. For public safety, access and use of the project area for hiking, camping, hunting, and other recreation opportunities will be restricted during operations. Recreation experiences of isolation, solitude, quiet and naturally appearing scenery will reflect the desired conditions for the Mineral Management Area.

Public lands adjacent to the project and throughout the analysis area are EVOS Acquired Lands Management Area and are managed for primitive recreation opportunities associated with solitude, isolation, quiet, and naturally appearing scenery. Direct and indirect effects will extend from the project area into the remaining analysis area. These include effects from noise, visual qualities and increase in human activities. These effects will reach beyond the project area in varying degrees with noise being the most noticeable but also the most temporary. Effects from noise will diminish quickly the farther away one is from the project area.
**Analysis Area**

The analysis area for direct, indirect and cumulative effects to recreation opportunities and experiences is the north/east half of Port Gravina. The primary area for analysis is the proposed project location. However, the analysis area includes land managed by the Forest Service south/west of the project area to the private property boundary towards Point Gravina, north/west across Port Gravina to Olsen Bay, north of Olsen Bay to include Parshas Bay and head of Port Gravina and south to include Beartrap Bay and Comfort Cove.

The temporal context for direct, indirect, and cumulative effects are measured from when exploration began in 2015 through 2045 to include 20 years for project implementation and 10 years for reclamation and anticipated significant site vegetation regeneration.

**Existing Conditions**

There are no Forest Service recreation cabins, hardened campsites, and maintained trails in the project area. The project area has been affected by recent human activity and impacts from mineral exploration conducted by CAC in 2015. Impacts include cleared pathways constructed from Secret Cove inland for heavy equipment access to mineral exploration at the two quarry locations. The two exploration sites are a tumble of white granite boulders accessed by hardened pathways that end in hardened pads where heavy equipment was used for excavation at each location.

The conditions within the remaining project area and greater analysis area can be considered natural in appearance with little to no evidence of human use. Recreation activities in Port Gravina and near the project area are primarily marine-based with recreationist`s sport fishing, wildlife viewing and enjoying the areas scenic qualities. Occasionally the public will go ashore at Secret Cove to enjoy the white granite beach or hike inland to nearby peaks for views of Port Gravina and the greater Prince William Sound.

**Environmental Effects**

**Measurement Indicators**

These indicators are used to assess the change in recreation opportunities and experiences affected by the proposed project. They include the following:

- Recreation Opportunity (number of recreation opportunities affected).
- Recreation Experience (effects to solitude, isolation, and quiet).
- Natural Appearing Scenery.
- Wildlife Viewing and Hunting Opportunities.

The recreation issues raised concerning this project are reflected in the selected measurement indicators. They are largely qualitative concerns associated with primitive recreation opportunities and experiences of solitude, isolation, and naturally appearing landscapes. Varying expectations associated with these indicators make quantifiable measurements difficult although no less important than indicators identified in other resource areas.

**Alternative 1 – No Action**

**Direct and Indirect Effects**

The No Action alternative would result in no quarry development. CAC will reclaim the existing disturbance from mineral exploration including road access and two quarry sites. Recreation opportunities, experiences, scenic qualities, and wildlife encounters in the project area would return to
pre-mineral exploration condition. The project area would continue to be managed under the EVOS Acquired Lands Management Area Plan with an ROS class of “semi-primitive non-motorized”. Management will focus on providing opportunities for solitude, isolation, and quiet. Primitive recreation including hiking and camping in the project area would continue to exist. Marine-based activities (motorized and non-motorized) in Secret Cove such as boat anchorage, beach/shoreline recreation and access through the project area would also continue to exist.

Cumulative Effects:
There would be no cumulative effects from the No Action alternative because there are no direct and indirect effects.

Alternative 2 – Proposed Action
The primary concerns for recreation are public safety, scenic quality and the effects of noise on solitude, isolation, and quiet.

Direct and Indirect Effects
Under the Proposed Action alternative, the project area would be managed as a Minerals Management Area with an ROS class of “rural”. Forest Service managed surface lands in the remaining analysis area would continue to be managed as EVOS Acquired Management Areas with an ROS class of “semi-primitive non-motorized”. Most of the effects from quarrying operations will be limited to the project area although some noise, visual effects, and increase in human activities will be apparent outside the project area.

Recreation Opportunity
Recreation opportunities in the project area will be affected during quarrying operations. As required in the Forest Plan for mineral management areas, recreation opportunities will be managed for compatibility with mineral development and provide for public safety. Activities such as hiking, primitive camping, and day use in the less than 100 acre project area will not be consistent with the management intent for mineral activities during quarrying operations. Timelines of the quarrying operations are expected to be market driven, however, the operating season can be 6-7 months depending on snow cover and daylight with a 20 person crew working 12 hours each day 7 days each week. Access and recreation opportunities within the project area will be restricted during these periods for public safety. Public access to Secret Cove and beach will also be restricted for public safety purposes during quarrying activities and barge traffic.

This is not expected to have a significant effect to overall recreation opportunities in the Port Gravina area. The project area is a small percentage of the entire analysis area publicly managed in Port Gravina. The limited number of people who will be displaced from the project area during quarrying activities will have the remaining analysis area to pursue recreation opportunities such as hiking, primitive camping, day use and other activities. Additional shore access to public lands north and south of the Secret Cove project area exits and has adequate boat anchorages.

Quarrying operations will be limited to the proposed project area and primitive recreation opportunities on public land in the remaining analysis area will not be restricted. However, the number of people recreating on public lands in the remaining analysis area is expected to increase.
Figure 3. Proposed Safety Closure Map
**Recreation Experience**

Recreation experiences associated with solitude, isolation, and quiet in the project area will be affected by quarrying operations. The project area will be intensely used and have a high density of roads and facilities including the construction of a permanent dock and two quarry locations; a site disturbance that will affect the experience of solitude and isolation. There will be heavy equipment and other machinery visible and in use during operations.

There will be considerable noise from machinery, boats, and blasting. The noise will be intermittent and thus temporary in duration during active operations. Noise will be produced from multiple sources including heavy equipment, large trucks, power generation, and blasting. Blasting will likely extend farthest beyond the project area but have the shortest duration. An estimated 200 blasts would occur each season which is roughly one blast per day.

During operations recreation experiences will be affected but only temporarily while the quarry is in construction and operation. Opportunities for solitude and quiet will be available when operations are not occurring. The Forest Plan requires the project area to be managed as a mineral management area which will change the desired conditions associated with expectations for recreation experiences.

Increased marine traffic from barges and crew transport boats will have an effect on the overall experience in the greater Port Gravina area. CAC anticipates 39 barges each year which would be over 3 per month. Crew transport would add additional boat traffic to the area. Additional traffic will affect both the recreation experience and increase the opportunity for boating mishaps.

Likely, the greatest affect to the recreation experiences of solitude, isolation, and quiet adjacent to the project in the area will be the effects from noise. Noises from operations are anticipated to diminish quickly over distance but there are limitations in determining the extent of the effects for the following reasons:

- No onsite measurements of noise can be made because no activities are present to measure
- A variety of variables exist including topography and vegetation affecting noise transmission making it difficult to determine the effects without activities present to measure
- Detailed information in the CAC Operations plan including specific equipment to be used, specific blasting charges and the variable drilling pattern, and an overall schedule are not available making it necessary to generalize the anticipated effects

It is reasonable to anticipate that any noise created from operations and heard by recreationists seeking a backcountry experience in the analysis area adjacent to the project will be perceived as negative. It is important to consider that a person’s perception of “noise” may differ from that of “sound,” and that simple decibel measurement alone is likely insufficient to describe what is acceptable and unacceptable. The recreation experience closest to the project area is generally expected to be more greatly affected but the effects will decrease with distance. Appendix B includes a number of recommendations to minimize effects from noise on the recreation experience. If these are incorporated into the operating plan, they will provide some mitigation but will not eliminate noise effects.

**Natural Appearing Scenery**

The naturally appearing scenery in the project area will be dramatically affected. Trees and other vegetation will be removed along with extensive amounts of soil to construct docks, work pads, facilities, and roads. Two open white granite quarries will be created and granite material removed down to the surrounding valley elevation. Soil will be stock piled and used for reclamation at conclusion of operations (see reclamation stipulations, Appendix B). The area will be managed for a ROS class of “rural” and scenic integrity objective (SIO) of low to very low for the duration of the quarrying operations of approximately 20 years.
In the remaining analysis area, boaters travelling from the head of Port Gravina toward Prince William Sound would likely have some view of the quarry area for approximately 5.5 miles of travel. The Scenery section and resource report provides details on the nature of the effects of this project on scenery, SIO, and visual quality.

**Wildlife Viewing and Hunting**
The opportunities for wildlife viewing and hunting in the project area and directly adjacent to the project area are anticipated to be affected during operations. Bears, marine birds, and marine mammals will likely be displaced by the noise and human activities both on land and on water. These effects are expected to diminish with distance from the project area and will be minimal when operations are not occurring.

**Cumulative Effects**
There are no known additional past, present or foreseeable future actions in the analysis area and therefore, no cumulative effects.

**Statutory and Regulatory Consistency**
Noise and visual effects within the mineral management area from blasting and other quarrying activities have the potential to affect recreationists in the adjacent EVOS managed lands. However, the project is consistent with the Forest Plan for both EVOS Acquired Lands Management Areas and Mineral Management Areas. EVOS Acquired Lands Management Area standards state that “access, exploration and development of subsurface estate” is allowed. Mineral Management Area standards state “Activities, identified in the underlying (initial) management area prescription, are allowed so long as they are compatible with mineral activity and provide for public safety”.

**Scenery**

**Summary of Effects**
Infrastructure, especially the dock, laydown area, and access road and associated operations will be unavoidably visible from various locations in Port Gravina. Visual effects can be partially mitigated by screening, planting of alders in key locations, staining of rock, and modification to some of the proposed quarry operations. Though effects are unavoidable, mitigation will reduce impacts and thus the project will be consistent with the Forest Plan.

**Analysis Area**
The analysis area for scenery is the viewshed as seen from the boat route down the middle of Port Gravina, toward the head and toward the mouth of the bay, as far in both directions as the proposed project site was visible. This area was chosen because the visual impact from the project will be seen primarily by boaters and recreationists passing by the area from the water. The timeframe for analysis is from the present to the distant future, because some visual impacts from this project, depending on the degree of mitigation taken to minimize visual effects, could last for well beyond the foreseeable future.

Past projects are included in the existing condition of the area. There are no other known current or future projects that would contribute to cumulative effects.

**Existing Condition**
Secret Cove is formed by a small island to the west that is covered with large coniferous trees. The beach is composed of white granite pebbles. The island is joined to the beach by a small stretch of white granite pebbles interlaced in light colored sand. The island base is craggy picturesque rock with some white
granite pebbles in between some of the rocks. The rocks here are deep brown contrasting the white pebble beach rock.

The beach shore line is lined with alder just above the white beach. Lower elevation vegetation is alder, then large conifers, and then stunted conifers with lots of open area upward away from Secret Cove. Conifers on the upper bench are stunted and are oddly shaped. These trees appeared to be very old, the bark was fissured and the limbs and trunks twisted like old growth.

A small ridge divides No-Name Creek Valley from Secret Cove and is visually important since everything to the west and north side of this ridge can be seen from Port Gravina and Comfort Cove. The landscape on the stream side cannot be seen from Port Gravina and only limited view from Comfort Cove.

Trees between the slope break and upper benched valley give way to open meadow and mossy slope. The terrain in the southeast part of the project site behind the ridge to the east is relatively flat but gains elevation rearward from the site. The few trees in this area are stunted and appear to be quite old. The Forest Service divides the forest into areas that are rated on their scenic value; Port Gravina is in the Prince William Sound Landscape Scenic Character area.

The quarry site is located in a small bight on the south side of Port Gravina that opens to the north and northwest. It is visible from the portion of Port Gravina to the north along the western shore, but the impacts will diminish with distance. The site is shielded from view from Prince William Sound proper by an intervening ridge and the distance of about 6 miles. The quarry will be most seen by boaters traveling from the head of Port Gravina toward Prince William Sound, where it will be in view from a vessel following the north shore for about 5.5 miles.

**Environmental Effects**

**Alternative 1 – No Action**

*Direct, Indirect and Cumulative Effects*

There would be no direct or indirect effects of taking no action and thus, no cumulative effects.

**Alternative 2 – Proposed Action**

*Direct and Indirect Effects*

The major project components and other considerations that will affect scenery are:

- A dock, loading and storage area composed of a large fill over the tidelands with sheet piling that supports a large pad composed of fill placed on the existing subtidal, intertidal, and upland zone;
- A road with switchbacks that leads from the dock to the quarry site;
- A quarry which will provide rock from two distinct topographic “knobs”. The quarry has the potential to be operated over a long (20 year) period of time;
- The rock is white in color when exposed so the rock faces of the quarry, road fills, dock fills, etc. will be highly visible from some viewing locations in Port Gravina.

The intertidal zone where the temporary then the permanent dock would be sited is under the jurisdiction of the state of Alaska. The temporary dock would stretch from the east bedrock beach half way to the island, out into Secret Cove. The permanent dock and boat ramp will fill the cove from the east beach rock to the island. This dock will extend from the high water line along the south beach about 500 feet into the cove. The entire temporary and permanent docks will be visible from the north and a large portion
of the dock will be visible from the west. Most of the dock will likely be visible from the western Port Gravina.

It appears that all of the larger conifers above the tideline, with the exception of a two small islands of trees, would be removed for road cut and fill in the switch back area of the access road. Removal of these trees will visually expose the quarry access road and associated cut and fill to views from the north and some views from the west.

A small ridge divides No-Name Creek valley from Secret Cove and is visually important for screening of project infrastructure; anything located on west and north side of this ridge can be seen from Port Gravina / Comfort Cove and anything located on the stream side cannot be seen from Port Gravina and only a limited view would be possible from Comfort Cove. Quarry operation including portions of the west work pad, stream bed and the east work pad would be visible from the water unless operations could be contained below this small ridge.

Three settling ponds are located in an opening behind the large conifer stand on the ridge above the east side of Secret Cove. These settling ponds will most likely only be seen from the air.

The rerouted No-Name Creek will not be seen from the PWS, Port Gravina or Comfort Cove.

The access road and cut and fill banks from the dock to the upper area will require the removal of a majority of the tall conifer trees south of the beach. The scar from cut and fill would be white granite that will be highly visible from a long distance.

Cumulative Effects
There are no known additional past, present or foreseeable future actions in the analysis area and therefore, no cumulative effects.

Statutory and Regulatory Consistency
The EVOS land designation prescribes a Scenery Integrity Objective (SIO) of High for the quarry site, however, the Minerals Management Area designation allows for a reduction of the SIO to Low and Very Low in recognition of the potentially inherent impact to Scenery in visible locations. The Forest Plan encourages the implementation of mitigation measures to minimize impacts and encourage return of the land to as close to pre-disturbance condition as possible. Stipulations for visuals and reclamation (Appendix B) were developed to minimize impacts and thus would bring the proposed action into conformance with the Forest Plan intent.

Special Uses

Summary of Effects
The proposed quarry will have direct and indirect effects to nine guides and outfitters that hold special use permits (SUPs) encompassing (but not limited to) the project area. Permitted activities include hunting, hiking, freshwater fishing, bear viewing, and an ANILCA Shelter Trappers cabin located approximately nine miles from the project area at the head of Gravina Bay. Effects to the outfitter guide authorizations include the possible reduction in the size of their authorized area, and limitations on recreation opportunities due to safety restrictions in the project area.

Effects from noise would be the most temporary, and all effects are expected to diminish once quarrying ends and reclamation activities are completed. All project infrastructure occupying National Forest System surface lands will be removed upon project completion (20 years).
As noted in the Subsistence section, hunting by project employees has the potential to impact wildlife resources near the project area, including species important to outfitter/guides such as mountain goats, black bears, and brown bears. Stipulation 14 would mitigate this effect by prohibiting sport hunting by project workers.

**Analysis Area**

Chugach Alaska Corporation’s proposal for the occupancy and use of National Forest System surface lands is the focus of this broader EA; unless otherwise indicated, this analysis focuses on potential effects to existing SUP holders. The analysis (direct, indirect and cumulative effects) considered all permittees authorized to operate, at any time of the year, in Port Gravina and Sheep Bay, because those bays are adjacent to lands containing the project area. The timeframe for analysis is from now to approximately 20 years in the future, when the project and associated reclamation is completed. No additional activities are known to be in the analysis area.

**Existing Condition**

Within the analysis area there are nine outfitter and guides with special use permits. Permitted activities include hunting, hiking, freshwater fishing, bear viewing, and an ANILCA Shelter Trappers cabin.

**Environmental Effects**

**Alternative 1 – No Action**

*Direct, Indirect and Cumulative Effects*

Under Alternative 1, there would be no activities or surface occupancy relative to the proposed CAC quarry developments. The conditions under the current SUPs would continue to exist, and there will be no direct, indirect, or cumulative effects if CAC’s surface use does not occur.

**Alternative 2 – Proposed Action**

*Direct and Indirect Effects*

Alternative 2 would have a direct effect on activities authorized under SUPs. There would be a reduction to the area authorized under the outfitter guide SUPs.

If safety restrictions are implemented with Alternative 2, recreational opportunities for SUP holders currently authorized to operate on National Forest System lands may become more limited in the project area. A temporary closure of the area immediately surrounding the quarrying site is recommended to protect the public, including SUP holders and their clients, from safety hazards associated with active quarrying operations. A closure order for safety would reduce the availability of about 239 acres of National Forest System lands.

Alternative 2 may result in animal displacement due to the noise of quarrying activities. This indirect effect could impact authorized hunting and wildlife viewing activities.

Overall, effects from noise would be the most temporary, and all effects, other than those associated with activities that may continue on adjacent private lands, are expected to diminish once quarrying ends and reclamation activities are completed.

Because big game hunting permit allocations are at capacity in surrounding areas, the Forest Service may not be able to modify the two affected hunting outfitter and guide SUPs to authorize operations in different areas. Therefore, big game hunting outfitter and guides are expected to be the most affected
group of permittees, however this will not affect the number of hunts, or service days allocated to complete the hunts, currently authorized. The permit holder will be allowed to continue to offer the same level of guided hunting, but within a smaller area of use. With the exception of the hunting authorizations, it may be possible, if requested by the permit holder, to modify access for some authorized activities during the project to allow permittees to operate in surrounding areas.

Brown bears are a highly valued trophy species utilized by outfitter/guides under special use permits. Brown bears within Port Gravina are also important to non-consumptive outfitter/guides under special use permits of the Chugach National Forest. Although little data exists on harvest rates of brown bears within the Sound, harvest by project employees could be additive to that already taking place. Stipulation 14 is proposed to mitigate this potential effect by prohibiting sport hunting in the area by project employees.

Existing special use permits in the Port Gravina area may need to be amended to exclude use within the project and safety closure areas.

**Cumulative Effects**
There are no known additional past, present or foreseeable future actions in the analysis area and therefore, no cumulative effects.

**Statutory and Regulatory Consistency**
The Minerals Management Area prescription, which would apply during the project, directs that special uses, which facilitate mineral activities, will be applied. A management area standard applied to mineral activities requires the Forest Service to apply reasonable regulation of surface occupancy and use to manage the mineral activities to be as compatible as possible with the underlying management area prescription (in this case, the EVOS Acquired Lands Management Area). Stipulations designed to mitigate impacts to National Forest System surface lands and resources incorporated into the operating plan will help to implement this direction.

The management intent for EVOS Acquired Lands Management Area, which applies to this area preceding and following mineral development, provides that no new roads are allowed, except those designed for purposes of accessing and developing the subsurface resources. An EVOS Acquired Lands Management Area standard directs that roads be closed or obliterated, except in certain circumstances, including where they provide necessary access for reasonable access and exploration to develop subsurface resources (Revised Forest Plan, p. 4-44). A stipulation providing that road purposes will be limited to accessing and developing the subsurface resources, and another requiring that infrastructure is removed following project completion will ensure consistency with management area intent and direction.

**Air Quality**

**Summary of Effects**
The proposed project would result in minimal seasonal, short-term increases in air pollutants in the analysis area. The primary source of air pollutants would be from exhaust emissions from heavy equipment, boat and barge traffic and power sources for the field camps. Sources of air pollutants would mostly be localized, and pollutants would quickly dissipate under most weather conditions. Air pollutants would not likely exceed Alaska State air quality standards (Alaska Department of Environmental Conservation 2015) and should meet Forest Plan Objectives and Forest Plan Standards as outlined in the 2002 Chugach National Forest Revised Land and Resource Management Plan (USDA, 2002).
**Analysis Area**
Direct, indirect, and cumulative effects are analyzed at the project area level. The timeframe for the analysis will be for the length of the proposed quarrying activity and reclamation.

**Existing Condition**
Airborne dust produces the largest source of dust pollution on the Forest. The greatest quantity of airborne dust is blown from natural sources, particularly floodplains of glacial rivers and tidal silt flats. The dust is most prevalent on windy, dry days when sediments are exposed. Fine dustings of volcanic ash from volcanic eruptions also occur on occasions. Emissions from fire, recreational campfires, and boat and air emissions are also other sources of air pollution in the project area. The area is currently designated as Class II under the Clean Air Act within the Southcentral Intrastate Air Quality Control Region and meets Alaska State air quality standards.

**Environmental Effects**

**Alternative 1 – No Action**

*Direct and Indirect Effects*
There are no direct or indirect effects to air quality under the no action Alternative.

*Cumulative Effects*
Because there are no direct or indirect effects from the No Action alternative, there would be no cumulative effects.

**Alternative 2—Proposed Action**

*Direct and Indirect Effects*
The proposed project would result in minimal seasonal, short-term increases in air pollutants in the area surrounding the project area. Sources of air pollutants would be localized, and pollutants would quickly dissipate under most weather conditions. Air pollutants would not likely exceed Alaska State air quality standards (Alaska Department of Environmental Conservation 2015a). The primary source of air pollutants would be from exhaust emissions from heavy equipment and power sources for the field camps, producing fine particulates, nitrogen oxides, and carbon monoxide. The proposed quarrying activities and stream reconstruction would likely involve a variable number of pieces of heavy equipment and an estimated total of 17,000 to 39,000 machine-hours per season (April through October). A secondary source of fine particulates would be dust created during earth moving activities/ construction and from vehicles and equipment traveling on access roads during dry periods. Dust abatement through the use of watering trucks during dry periods may reduce particulates. Heavy equipment would be primarily confined to the project area.

*Cumulative Effects*
There are no known additional past, present or foreseeable future actions in the analysis area and thus no cumulative effects.

**Statutory and Regulatory Consistency**
The Port Gravina project, as stated above under direct and indirect effects are expected to meet Forest Plan Objectives and Forest Plan Standards of meeting state standards for visible and particulate air quality as outlined in the 2002 Chugach National Forest Revised Land and Resource Management Plan (USDA, 2002).
Agencies and Persons Consulted

The Forest Service engaged in discussions regarding this project and this environmental assessment with the following Federal, State and local agencies, Tribes and non-Forest Service individuals:

- Chugach Alaska Corporation
- State of Alaska, Department of Environmental Conservation
- State of Alaska, Department of Natural Resources
- State of Alaska, Department of Fish and Game
- State of Alaska, State Historic Preservation Office
- Army Corps of Engineers
- US Fish and Wildlife Service
- NOAA—National Marine Fisheries Service
- *Exxon Valdez* Oil Spill Trustee Council
Appendix A—CAC Operating Plan

Port Gravina Quarry Operating Plan, revised 2/4/2016

The Chugach Alaska Corporation (CAC) proposes to develop a quarry site within Port Gravina. In addition to the upland quarry, additional infrastructure, to include docks, a man camp, roads, and possibly an airstrip, will be constructed for the proposed project. The property is located approximately 30 air miles south of Valdez and 16 miles west/northwest of Cordova. The proposed project lies within Secret Cove located within Sections 28, 29, 32, and 33; Township 13 South; Range 5 West; Copper River Meridian (Lat 60.7090, Long. -146.1360). The temporary dock will be used to assist with the development of the quarry and is expected to be in service for at least 5 years. The permanent dock will be used once the quarry has reached an operating stage and is expected to be in service for 50 or more years. The adjacent upland surface estate is owned by Federal Government under a sale which took place by the Exxon Valdez Oil Spill Trustee Council. The US Forest Service (USFS) manages the surface estate as part of the Chugach National Forest. The adjacent upland subsurface estate and a portion of the adjacent surface estate is owned by the CAC, which was granted these rights by the Federal Government under the Alaska Natives Claims Settlement Act (ANCSA). CAC is within their rights as the subsurface owner of the uplands to develop a quarry at this location, and the proposed docks would assist in their development.

If developed, Port Gravina will be a multiphase project that will provide material for infrastructure development, construction, and repair projects throughout Alaska and the Pacific Northwest for approximately 20 years. Two operating quarry sites are planned within the project area, referred to as West Quarry and East Quarry. All development completed for this project will be done in such a way as to minimize disturbance by choosing the alternative with the least environmental impact and by using proper Best Management Practices (BMP) during development and operations. The quarries and additional project components including roads, docks, and work pads are described below.

Temporary Dock

The Temporary Dock will be constructed by placing 3,000 cubic yards of fill material above High Tide Line (HTL) to avoid impacts to tidelands. Of this total fill, approximately 1,000 cubic yards will be armor rock for erosion protection. The top of the temporary dock landing and associated work pad between the dock face and the beach will be at an elevation of +20 feet Mean Lower Low Water (MLLW). A modular pile supported steel trestle will be connected to the pad and extended out into the water approximately 216 feet to achieve the required water depth for the barge. The trestle will be supported by a total of (18) 24-inch diameter driven steel pipe piles. Two breasting dolphins will support a lifting frame to handle an 83-ft ramp. The dolphins will be constructed of a 36” diameter king pile and 2-18” diameter batter piles each. The hinged ramp will allow for operation through the tidal cycle. A preconstruction survey will be performed so that baseline elevations can be established for future use in removing the Temporary Dock and re-establishing the area to its original state, should it be necessary to remove the Temporary Dock prior to the construction of the Permanent Dock.

Following the receipt of a state tideland lease and expiration of the tideland permit, the (18) 24-inch diameter trestle piles and the piles for the two dolphins will be removed, and the landing will be incorporated into the permanent dock as shown in the drawings. Armor rock will be salvaged, but the remainder of the fill for the temporary dock will be encompassed by the permanent structure.

Permanent Barge Dock

Development activities for the quarry include constructing a barge dock and ramp structure along the shore of Secret Cove. The permanent dock will consist of a sheet pile fill dock, approximately 500 feet x
400 feet, constructed along the beach of Secret Cove. Sheet piles will be placed in the cove where bottom elevation is approximately -25 feet MLLW. Temporary fill may be required for construction purposes on the northern side of the piles to assist with placement, but will be removed once the dock is complete. Non-frost susceptible fill (from the uplands quarry) will be placed behind the sheets (on the south side of the sheets) up to an elevation of +22 feet MLLW, incorporating the already placed fill of the temporary dock. The overall dock layout is displayed in the attached drawings. Dredging is not expected to occur for the permanent dock.

The fill dock will handle barge mooring and loading for quarried rock transport. Once the permanent barge dock is constructed, full-scale quarry operations can begin.

Safety of the general public is of primary concern along the shoreline and within the boundaries of Secret Cove, though the proposed development and operations will have minimal impact on public access. Access along the gravel beach will still be allowed except during activities that could impact the safety of the public. Public access to water within Secret Cove will only be restricted during times of vessel maneuvering.

Barges and vessels using the docks will be approximately 100 ft x 400ft. The barges will be loaded by wheeled loaders or haulage trucks. If a barge has a ramp, it will be utilized for loading over the stern; if it does not, loading will take place over the side of the barge. Barge and vessel operators accessing the site will be responsible for having the necessary permits in place for their operations. This will include authorizations for the take of marine mammals from the National Marine Fisheries Service and/or the US Fish and Wildlife Service.

The applicant proposes to construct the fill dock within Secret Cove in a location that would not only meet all of the project requirements for a dock, but would also conceal the structure to the greatest extent practicable. The quarry sites were also selected in an uplands area to conceal the quarry operations from boaters in Port Gravina.

**Lay Down Pad**
Above the Mean High Water (MHW), adjacent to the Temporary Dock, a lay down pad will be constructed of rock and soils excavated during construction of the Quarry. Construction of the Lay Down Pad will potentially impact 4.5 acres of wetlands. The pad will be graded in a way such that surface water will drain into vegetated swales along the perimeter of the pad, being treated prior to discharging into Secret Cove.

**Camp Access Road & Pad**
The Camp Access Road will consist of a 30-foot wide road between the Main Work Pad to the east onto CAC property. The road will then widen to 40 feet along a straight stretch heading south towards the Camp Facilities’ Pad. The road is approximately 3,320 feet in length and will require placement of 70,800 cubic yards of material. This road also crosses an unnamed stream that runs between the Main Work Pad and East Quarry, and will require a single span bridge or fish passage culvert structure. The camp access road is also oriented to allow the road to double as an airstrip in the future; however, plans for the airstrip would be submitted at a later time. The Camp Pad (400 feet x 200 feet) will consist of approximately 63,300 cubic yards of fill over an area of approximately 4.0 acres. The camp itself will consist of an ATCO trailer-type camp consisting of multiple attached structures that will be easily removable upon completion of the work.
Dock Access Road

The Dock Access Road will consist of a 30-foot wide switchback roadway that connects the Main Work Pad and the Lay Down Pad. It traverses a steep area, moving from the uplands down to the beach. The Dock Access Road will be approximately 795 feet in length and will require placement of approximately 13,000 cubic yards of fill material and a small amount of excavation in order to build into the steep hillside. The road will cover an area of approximately 3.2 acres. Excavated material will be used to construct the Lay Down Pad and/or the Main Work Pad. The drivable roadway surface is 30 feet in width graded for drainage and has a maximum gradient of 10 percent. Along the cut slope side(s) of the road a swale will be constructed to collect stormwater runoff and rock fall from the cut slope(s). A 4-foot tall berm will be constructed on the fill side of the roadway per Mine Safety and Health Administration (MSHA) requirements, and a runaway truck ramp is proposed towards the bottom of the road to prevent haul trucks from having to maneuver the sharp turn at the bottom in the case of failing brakes. The distance from MHW to the blasting will vary between 50 and 600 feet along the roadway. The distance from non-anadromous streams to blasting areas will be approximately 500 feet.

Quarry & Main Work Pad

The quarry will consist of two sections, the East Quarry and the West Quarry. These sites will be operated and expanded over an estimated timespan of 20 years with the full 20-year extents shown in the drawings. The quarries' amounts and locations will be developed based on production needs in order to minimize impacts to the existing site. Both quarry sections will eventually be mined down to the elevation of the proposed work pad (approximately 100 feet MLLW). Materials recovered from quarry operations will be sold or used onsite for construction purposes. Any overburden will be stored on site for later use and reclamation. Locations for overburden storage will vary. A designated spot is located directly to the southeast of the main settling pond above the Camp Access Road. Other locations will be within the quarry footprint once the area is mined, and to the south of the pad. As work progresses, the overburden may have to be relocated within the project footprint as the quarry is expanded. Additionally, overburden will be placed on benches for reclamation once quarrying in a specific area is complete. This will decrease the overall quantity of overburden storage required during the life of the project.

The Main Work Pad is divided by an unnamed stream that runs from south to north adjacent to the East Quarry. Its close proximity to the eastern quarry operations would make operations difficult, and potentially create issues while blasting and maneuvering around the site. To counter this issue, the stream would be permanently diverted to the west, equidistant between the two quarries, allowing more room to maneuver and creating a greater distance from the operations. The diverted stream would be a constructed channel with habitat features, consisting of large boulders and material replicating the contents of the natural channel, a few pools, and some riffles. This reconstruction would introduce more habitat than the existing channel in this area, as the existing channel is extremely shallow and wide with no undercut banks. The new channel banks will consist of vegetation, root wads and riprap in some areas that may be prone to erosion. A bridge will be constructed over the full width of the stream to allow traffic between the East Quarry and West Quarry sites and either side of the Main Work Pad. Diversion of this unnamed stream will be postponed until absolutely necessary, and will be completed during a period of low flow and following all Alaska Department of Fish & Game’s Fish Habitat Permit stipulations.

Sediment settling ponds will be constructed adjacent to the quarry sites. The ponds will be designed to collect stormwater runoff from the quarry area and from the quarry work pad. The Main Work Pad will be graded in such a way to direct surface runoff into drainage ditches or towards the main settling pond at the north end of the site. The East Quarry and associated work pad will be graded/benched to drain to the northeast (away from the unnamed stream) into another settling pond. The ponds will be sized to accommodate a maximum water depth of 4 feet and maximum impoundment meeting all ADEC
requirements. The distance from the bottom of the pond to the top of the berm will be no higher than 8 feet.

Quarry operations will be performed by a qualified contractor who will be responsible for obtaining the applicable local, state, and federal permits. Operations and timelines will be market driven and begin following receipt of applicable infrastructure permits.

**Quarry Operations**

The quarry buildings will staff fewer than 20 people during normal mining operations. An adjacent camp will be constructed of ATCO trailers or conex boxes laid out onto a pad of crushed rock. Surface water will be pumped for use from an undiscovered surface water source or a drilled well to the camp and then run through an Alaska Department of Environmental Conservation (ADEC) approved water filtration and/or disinfection system prior to consumption. All domestic wastewater will either be collected in a holding tank and removed off site via barge to an approved Alaska Department of Environmental Conservation (ADEC) disposal site or will be discharged into an onsite secondary treatment system. Permits will be submitted to ADEC as the final design is generated and quarry operations begin.

Quarry operations will include drilling and blasting. The operator will draft a Mine Plan after a sufficient amount of exploration has been completed. The Mine Plan will show areas to be mined, taking into account the material size and yield of the desired product. The area to be mined will be surveyed and self-propelled, diesel over hydraulic rock drills will be used to drill the desired amount of holes in the configuration that will best produce the product desired. This will be driven by the material order contracts being filled. Explosives will be loaded and, using Mine Safety and Health Administration (MSHA) guidelines, the blast will be initiated. Approximately 200 shots are expected per operating season. Operations are likely to occur at both quarry sites during the same time, but this is based on the contractors using the site, and the material order contracts being filled. Explosives will be stored in compliance with MSHA guideline on top of the quarry site to restrict access from unauthorized individuals.

Quarry operations will be performed by a qualified contractor who will be responsible for obtaining the applicable local, state, and federal permits, and following appropriate safety protocol, such as the development of a bear safety program. Operations and timelines will be market driven and begin following receipt of applicable infrastructure permits. The operating season will vary as each year due to changes in snow cover and levels of light, which could significantly increase operating costs. Operations will be avoided as much as possible during times of the year when there is snow cover or low levels of light. Operations at the site should be possible approximately 6-7 months each year. Depending on the contractors and orders, operations at the site will likely occur 12 hours a day, 7 days a week. The added cost and impact of auxiliary lighting will be avoided as much as possible. All motorized equipment will have operational factory supplied lighting as mandated by MSHA. Additionally, all regular vehicle maintenance will occur on CAC land. During non-operational months, winterization will occur. Vehicles, explosives, and fuel will either be barged offsite or will be stored on CAC land during this time.

**Hazardous Materials and Sedimentation Concerns**

Fuel will be brought to the site via a fuel truck on a barge or landing craft. The fuel will be offloaded into another fuel truck that will be parked on containment, except when in use. This satisfies both US Coast Guard (USCG) and ADEC requirements and is a very safe method of transportation and storage. The weekly safety meetings will address the proper way to fuel in order to prevent spills. The fuel truck will be checked for leaks and spills on a weekly basis. CAC will make spill kits available for use at the dock and the quarry in the event of any spills. Industry standard BMPs along with those recommended by the ADEC will be used to ensure that there is little to no sediment released into nearby waters or wetlands.
Fill slopes will be kept at 2:1 for erosion control, and cut slopes will be in rock which has very small erosion potential. Roads will have ditches, and the main work pad and quarries are designed so that they will drain towards the settling ponds shown in the attached drawings.

**Proposed Project Timeline**

The planned construction date for the proposed project is summer 2016. Construction of the main work pad and quarry will be phased over a 20-year period. In order to meet the proposed construction start date, permitting agencies were contacted informally in February of 2015 in an effort to identify any activities that might hold up permitting the project.

**Noise**

During construction of the roads from the beach to the quarry area, it is likely that some of the blasts may be audible in close proximity such as to Port Gravina recreational users. During regular quarry operations, which will be mainly market driven, blasting noise will be limited and likely not an issue for nearby recreational users. Weather, topography, direction of blasting, and many other factors affect audible range, which makes it difficult to give definitive distances and decibel levels at this point in the permitting process.

**Dust**

The nature of the land (mostly solid granite and generally moist) doesn't lend itself to significant potential for dust pollution. Mine Safety and Health Administration (MSHA) and the Occupational Safety and Health Administration (OSHA) both have guidelines for dust control to protect employees and the public. The Environmental Protection Agency (EPA) and the Alaska Department of Environmental Conservation (ADEC) have clean air and water regulations aimed at protecting the environment, which CAC and all subcontractors will be following. Best Management Practices will be followed to limit dust or any potential negative effects on the community, lands, or environment generated by the quarry project.

**Reclamation**

Following completion of the project, current BMPs for quarry closeout will be followed. Due to the long-term nature of the project, it is difficult at this time to determine the exact procedures that will be taken.

At a minimum for safety, a fence and signage will be installed to prevent inadvertent entry from the rock face, the face will have steps to limit rockfall hazards, and signs will be posted to prevent entry without knowledge of the terrain. The area, including all road and pad footprints, will be restored to a look similar to the local surroundings following natural contours using re-vegetation (with native seed mixes and plant stocks if available), addition of topsoil, and will occur in such a way, to the best extent feasible, that the area will return to a natural look within a reasonable amount of time. All structures will all be removed, the fuel barged off-site, and hazardous materials containment areas given a thorough final inspection. Roads will be restored to their original condition with organic materials set aside at the beginning of the project and/or reseeded with seed recommended through the Alaska Department of Fish and Game and the ADEC.

**Construction Sequence**

A possible construction sequence for this project is as follows:

1. Survey and stake clearing limits.
2. Clear and grub quarry sites.
3. Clear vegetation and overburden at Lay Down Pad site adjacent to the shoreline and along the shoreline roadways.
5. Construct Dock Access Road.
7. Construct Temporary Dock.
8. Construct drainage swales and sediment/settling pond to collect stormwater runoff from quarry and quarry work pad.
10. Construct Permanent Dock (dependent on tidelands lease).

Permitting and contractor preferences may dictate a different development plan from that described above.

**Additional Permitting Concerns**

PND Engineers, Inc. will act as the agent during the permitting process of the Port Gravina Quarry project on behalf of Chugach Alaska Corporation. Copies of all permits required from other agencies will be provided to the USFS to be treated as appendices to this Operating Plan. Final design drawings for infrastructures, such as bridges, docks, and roads will be stamped by a professional engineer certifying the design and criteria. CAC is applying for the following permits concurrently:

- US Army Corps of Engineers (USACE) Section 404 Clean Water Act & Section 10 Rivers and Harbors Act permit
- Alaska Department of Fish and Game fish habitat permit
- Alaska Department of Natural Resources
- Land use permit (temporary dock)
- Tidelands lease (permanent dock)

Copies of permits from these agencies will be provided to the USFS and will be treated as appendices to the operating plan.

Additional agency coordination will take place as part of the USACE public notice and the NEPA process that will be carried out by the USFS. It is anticipated that the following agencies will have some involvement, either via comments or further permitting, as the project progresses:

- Alaska State Historical Preservation Office
- National Marine Fisheries Service
- US Fish and Wildlife Service
- US Coast Guard
- Alaska Department of Environmental Conservation

Comments from these agencies may be provided to the USFS to use as appendices to the operating plan.
### Port Gravina Quarry

#### Quantities

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#### Quantities in Chugach National Forest

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Appendix B—Stipulations, Recommendations and Monitoring Requirements

Stipulations

General
Chugach must obtain and comply with the following permits and plans and provide a copy of these approved permits to the Forest Service:

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
- Alaska Pollutant Discharge Elimination System (APDES) (AS 0.10, AS 09.25, AS 11.81, AS 12.55, AS 22.10, AS 31.05, AS 38.05, AS 39.52, AS 40.25, AS 44.46, AS 44.62, AS 44.64, AS 45.50, AS 46.03, 18 AAC 75, 18 AAC 72, 18 AAC 83, 2 AAC 96, 11 AAC 110, 18 AAC 50, 18 AAC 60, 18 AAC 70, 20 AAC 25) (this results in adoption of a Storm Water Pollution Prevention Plan (SWPPP))
- Solid waste disposal permit. (AS 46.03.020, AS 46.03.100, AS 46.03.110, AS 46.03.120, 18 AAC 15, 18 AAC 60)
- Approval to construct engineered wastewater disposal system. (18 AAC 72)
- Waste disposal permit (wastewater discharge). (AS 46.03.020, AS 46.03.100 & 110, AS 46.03.120 & 710, 18 AAC 15, 18 AAC 70, 18 AAC 72)
- 401 Water Quality Certification-Certificate of Reasonable Assurance Section 401. (AS 46.03.020, 18 AAC 15, 18 AAC 70, 18 AAC 72)

DEPARTMENT OF FISH AND GAME
- Title 16 Fish Habitat Permit
- Stream crossing permit
- Fish Resource Permit – Removing fish/diverting water (5 AAC 41)

DEPARTMENT OF NATURAL RESOURCES
Division of Mining, Land and Water
- Lease of Tidelands. (AS 38.05.070-075, 11 AAC 62).
- Water Use Permit. (AS 46.15, 11 AAC 93)
- Water Rights (AS 46.15, 11 AAC 93)
- Mining reclamation plan approval. (AS 27.19, 11 AAC 97).
- Temporary water use permits for water withdrawals, except for withdrawals from sources classified as categorically consistent or generally consistent approvals. (AS 46.15.155, 11 AAC 93)
- Tideland use permit. (AS 38.05.850, 11 AAC 96)

U.S. FOREST SERVICE
(Code of Federal Regulations: Title 36 - PARKS, FORESTS, AND PUBLIC PROPERTY)
- Notice to Proceed (FSM 2832), which accepts the operating plan and associated stipulations.
- Approval of Mining Reclamation Plan, in collaboration with ADNR.
- Temporary access road special use permit, if required. (36 CFR 251.110).
DEPARTMENT OF ARMY – CORPS OF ENGINEERS
- Compliance with section 10 of the Rivers and Harbors Act of 1899. (33 U.S.C. 403)
- Compliance with section 404 of the Clean Water Act. (33 U.S.C. 1344)

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

U.S. FISH AND WILDLIFE SERVICE
- Compliance with the Endangered Species Act, as needed, for Threatened or Endangered Species through consultation with the U.S. Fish and Wildlife Service (Endangered Species Act, 87 Stat. 844)

US Environmental Protection Agency/State Fire Marshal

**Heritage Resources**

1. **Discovery and Education Stipulation:** Any cultural and/or paleontological resources (historic or prehistoric site or object) discovered by the Chugach Alaska Corporation or any person working on the Chugach Alaska Corporation’s behalf, on public or Federal land shall be immediately reported to the Chugach National Forest Authorized Officer in Cordova, Alaska. The Chugach Alaska Corporation or its contractors shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be required and presented to the Authorized Officer to determine the appropriate actions to follow to prevent the loss of significant cultural or scientific values. Any decision as to proper mitigation measures to be taken will be made by the Authorized Officer after consultation with the Alaska State Historical Preservation Office. Collection or disturbance of artifacts and other archaeological, historical, and paleontological materials by the Chugach Alaska Corporation employees, its representatives, or contractors, shall not be allowed. Offenders shall be subject to prosecution under the appropriate State and Federal laws.

2. **The proposed project will comply with Section 106 of the National Historic Preservation Act and FSM 2361.03, if the heritage resource recommendations above are followed. If the undertaking would likely alter the characteristics of these sites as defined in 36 CFR parts 800.2(0) and 800.9 or if additional prehistoric or historic materials are found during the course of this project, work in that area should cease until the District Ranger has been notified. Work in the area of the cultural resource may not resume until the cultural materials and the potential effects have been evaluated by a professional archaeologist. Final notification to proceed will be given by the District Ranger.**

3. **The areas that include COR-00579 and COR-00580 are outside of the project area and therefore these sites should not be affected by project implementation. Any actions in these areas would be outside of the project area and is therefore not authorized.**
Visuals

4. Retain a no-disturbance strip of beach fringe timber on the west-side of the dock/lay down area to minimize visual impacts of the laydown area from Port Gravina.

Soils

5. Vehicular traffic and other surface impacts to adjacent, non-project areas are prohibited.

6. Design the Quarry Plan to ensure the retention of soils upon hillslopes at quarry sites until areas are planned for active blasting/quarrying.

7. Minimize traffic and other surface disturbance to soils until they are to be removed for development.

8. Armor outlets as necessary to avoid scour and erosion of adjacent slopes.

Fish/Hydrology

9. Service and refuel equipment a minimum of 100 feet away from streams or waterbodies and wetlands. Equipment operators will carry absorbent pads and spill response kits, provide containment and cleanup for portable fuel tanks (including hose and nozzle), follow approved disposal methods for waste products and repair leaky equipment promptly (FSH 2509.22).

10. Complete an Oil and Hazardous Substances Pollution Contingency Plan to prevent the contamination of waters from accidental spills of oil and hazardous substances at sites where a Spill Prevention Control and Countermeasure (SPCC) plan or hazardous substances contingency plan is required (FSH 2509.22).

11. Re-establish and maintain a vegetated buffer strip a minimum of 20-foot wide above the ordinary high water level on each bank of the constructed channel.

12. In the deep pool(s) proposed for the constructed channel, placement of spawning gravel will replace the spawning area lost in the dewatered section of the creek. A 1-foot layer of 1/2 to 1.5-inch gravel should be placed in the tailout of the pool centered on the thalweg. The gravel mixture should have less than 15% sand or smaller material. The gravel area should be a minimum of 9 square meters per pool to allow multiple pairs of fish to spawn.

Invasive Species

13. All heavy equipment used in project area should be cleaned prior to entry on Forest Service lands to prevent the introduction or spread of invasive species. The DOI Technical Memorandum (No. 86-68220-07-05: Inspection and Cleaning Manual for Equipment and Vehicles to prevent the Spread of Invasive Species) is a good reference for equipment cleaning.

Wildlife

14. The sport harvest of mountain goats, black bears, and brown bears on Chugach National Forest lands in Port Gravina by employees of the project operation is prohibited.

15. Food and garbage should be secured or stored in bear-proof containers or by other acceptable methods that makes it unavailable to bears or other wildlife. Garbage should be disposed on a routine schedule to prevent creating a wildlife attractant.

16. Bald eagle nest protection standards to be followed are outlined in a Memorandum of Understanding with the U.S. Fish and Wildlife Service for active nest sites, if applicable.
**Special Uses**

17. The occupancy and use of National Forest System surface lands may not directly impact a larger area than is as described and accepted in the Operating Plan, without advanced notification to the Forest Service.

18. The use of roads and associated infrastructure on National Forest System surface lands is limited to purposes directly associated with accessing and developing the subsurface estate.

**Reclamation** These stipulations apply to different phases of reclamation including: post construction (following development in a particular area), interim reclamation (following completion of a portion of the project area or as an aspect of continued operations) and final reclamation (at the conclusion of the project).

19. The presence of infrastructure associated with site access and other surface occupancies is limited to the term of the project. During reclamation all roads and pad footprints will be reclaimed through contouring, top soiling, and revegetation.

20. The reclamation shall provide for all roads and pad footprints to be restored to natural conditions upon project completion.

21. In reclaimed areas: soil should be at least 6 inches deep, as the minimum soil depth observed naturally pre-activity.

22. During reclamation, heavily trafficked areas (i.e. roads, work/lay down pads, stockpile areas, etc.) shall be rock-ripped or subsoiled.

23. After reclamation (soil spreading), further equipment traffic and/or other surface impacts will be avoided.

24. The reclamation plan shall specify that removed soil must be retained and stockpiled in USFS approved designated areas, located away from waterbodies, for future reclamation. Soil stockpiles will be located outside of quarry sites to avoid relocation/material loss and ensure that soils remain relatively clean. Soil stockpiles should be stabilized to prevent soil loss. Trees cut for project area clearing may be used to stabilize soil stockpiles and for mulching in future reclamation efforts.

25. Any soil and organic material dredged from settling ponds should be stored in soil stockpiles for reclamation.

26. The quarry development plan shall specify that soil removal and recovery will be maximized utilizing equipment most suitable for this goal. An excavator should be utilized in areas where there is uneven/variable subsurface rock contact.

27. Post Construction, utilize excavated soil and other organics on cut and fill slopes (i.e. road and pad fill slopes), after initial construction, to mask the white color of the rock and provide a seedbed for revegetation.

28. Natural revegetation should be utilized where seed source and site conditions are favorable or use native plant species in revegetation/restoration projects when natural revegetation conditions are not favorable. Preference should be given to plant materials from the local project area to maximize adaptation to that environment and maintain local genetic composition. Under no circumstance may nonindigenous plant material be used for revegetation. Application of any seeded plant materials must be coordinated in advance with the Forest Service.

29. Interim reclamation shall be implemented in quarry areas that are no longer being utilized as per the approved quarry and reclamation plans.
**Safety**

30. Post any Forest Closure order at the project site as specified by and in cooperation with the Forest Service to provide for public safety during and following project implementation.

**Recommendations**

**Heritage Resources:** There is an opportunity to remove the significant portion of the culturally modified tree (CMT) at COR-00581 for use as an interpretive medium (i.e. Ilanka Cultural Center, Cordova Forest Service Office) and also to core and date the scar. It is also recommended that a “cookie” be cut from the base of the CMT to include a portion of the scar and can also be used for dating and mobile interpretation on dendrochronology and cultural practices. This could be a valuable tool in sharing information regarding this cultural practice historically done by many of the Tribes in the area. Additionally, cores of the live CMTs and wedges from a sample of the dead CMTs in the Secret Cove Grove (COR-00581), just outside of the project area, could be taken to procure additional scar dates that could better inform the chronology of the cultural practice in the general area and assist in the interpretation of the COR-00581.

**Visual Resources:** If the area between the cut and fill from the main work pad and the access road has adequate room, Chugach should consider transplanting alder in the development of the quarry plan in order to reduce visual impacts.

**Noise:** Limit the hours of operations. Noise impacts are less significant during the daytime. To the extent possible, limit and consolidate blasting to minimize the extent and duration of the effects during quarrying operations. To the extent possible, take advantage of topography and dense vegetation to create noise barriers for both blasting and establishing locations to place noise producing quarrying equipment. Enclose high noise sources with acoustic barriers to dampen the sound.

**Monitoring**

Forest Service shall monitor operations as needed to ensure compliance with the operating plan, required stipulations and reclamation plans.

**Invasive Plant Species:** The project site should be surveyed for invasive plant species once every two years by the proponent and any invasive plant species within the project area must be controlled with appropriate treatment methods to eliminate introduced invasive species and control potential for spread onto areas outside of the project area.

**Heritage Resources:** Monitoring will occur in the lay-down area in the location of the single CMT (COR-00581) during construction by a cultural resource specialist. The area was tested for subsurface cultural deposition with negative results. However, because of the potential for this area to be a prehistoric basecamp from which people peeled trees at sites COR-00579 and COR-00580, site monitoring is required during construction at this location.