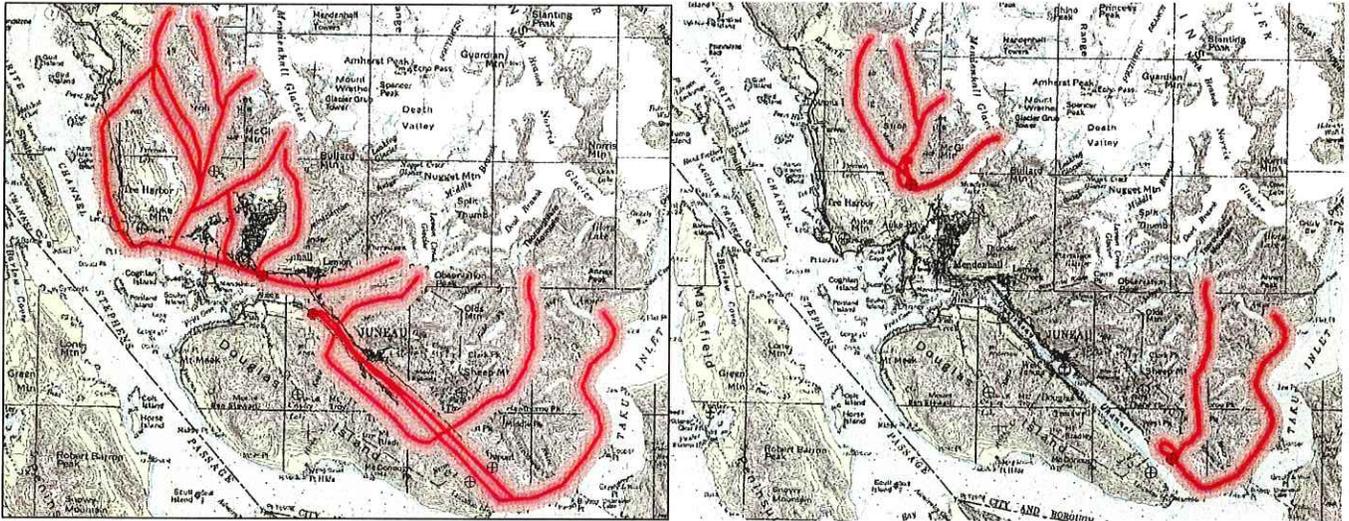


ALTERNATIVE HELIPORT SITE ANALYSIS

September 24, 2001 Final Report



for the
City and Borough of Juneau



by

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Alternative Heliport Assessment for the City and Borough of Juneau

Summary

For a number of years, the concept of using alternate heliport sites as a means of reducing the impact of flightseeing noise in Juneau has been discussed. Following last year's analysis of flightseeing noise in Juneau by Michael Baker Jr. Inc., Baker was again hired by the City and Borough of Juneau (CBJ) to evaluate and recommend alternate heliport sites.

From the start of this study we have believed that unless alternate heliports could offer dramatic reductions in flightseeing noise, they were not worth pursuing. A proposed solution that reduces noise for 1,000 people, but does so by inflicting an increased noise level on 600 others, would not be a solution at all. The recommendations in this study have the potential to reduce or eliminate flightseeing noise impacts for most residents of the borough.

Working with the CBJ, we developed a set of screening criteria that focused on safety, noise, and impact on neighborhoods for the evaluation of potential alternative heliport sites. The criteria are included in Section 1.1.

Representatives of Baker and BridgeNet International, a Baker subcontractor that specializes in sound evaluation, presented these criteria at a public meeting at Centennial Hall on May 24th, 2001. We explained the criteria and the public asked questions and made suggestions. Following the meeting, the criteria were revised to incorporate suggestions made by the public and CBJ staff. The revised criteria were posted on the CBJ web site.

The U.S. Forest Service regulates both the number and location of helicopter landings on Juneau Icefield glaciers. We worked with the Forest Service to use this information as part of its destination-based analysis of potential sites. The vast majority of flightseeing customers are from the cruise ships in the Juneau harbor. Their flightseeing destinations are primarily on the Mendenhall Glacier to the north and on the Norris Glacier to the south.

Because the glacier helicopter landing sites and flightseeing routes tend to divide into north and south groupings, it was apparent early in the study that the goal of relieving the maximum number of homes from flightseeing noise was best served by two sites, one to the north and the other to the south (See Figure 1.1 – USFS Map – Proposed Action Flight Routes and Icefield Landing Sites). Analysis

throughout the study reinforced this conclusion.

We used the screening criteria to winnow the sites through a series of screening levels. Part of the evaluation of each site that made it past the Level 1 Exclusion Criteria (they all did) and the Level 2 screening, was to compare the number of households that would be affected by noise from flightseeing helicopters going to and from their permitted landing sites from each of the potential sites. A table showing the summary site evaluations of all sites is found in Section 1.1.3.

To quantify this comparison, three thousand foot and six thousand foot corridors were drawn along the potential flight routes (as a point of reference, 5,280 feet equal 1 mile). The number of residences within each of these corridors was then counted and compared. These corridors do not contain all the residences that would hear helicopter noise from the flight routes and are not noise contours.

The flightseeing noise level along any given route is affected by a host of factors. Sound travels farther across water, rock, or ice; it is affected by the humidity, wind, the height and density of cloud layers and topography to name just a few. With an understanding of this variability, the noise levels at the edges of the 3,000-foot corridor (1,500 feet from the flight route) are roughly estimated to average about 65 dBA (the level which starts to interfere with conversation). Noise levels at the edge of the 6,000-foot corridor, are roughly estimated to average approximately 55 dBA (the level where aircraft are clearly audible).

Last summer's noise study found that most residential areas of Juneau, away from major roads, have daytime L90 noise levels (the noise level that is exceeded 90% of the time) in the low 40s dBA. In a very quiet environment, distant helicopter noise down into the 30 dBA level is audible, but quieter than the ticking of a bedroom clock. The purpose of the noise corridors was to provide a reliable, apples to apples, comparison between the sites.

In evaluating the impact of flight routes, we also considered on a case-by-case basis, the frequency the route would be used. Noise from five helicopters a day has a far different impact on residents than noise from fifty helicopters a day even if there is no difference in the maximum noise. If residences are impacted by floatplane flightseeing noise as well as helicopter flightseeing noise the impact on residences is greater than the sum of the two parts.

Some sites offer the potential of good weather routes that would be heard by few if any residences. If, however, helicopters flying low ceiling routes from these sites would impact an unacceptable number of homes, the sites were not advanced

through the screening process. The analysis of all of the noise corridors is based on the presumption that while charter helicopter flights would continue to originate from the airport, all helicopter flightseeing would move to the alternate heliports. A scenario that simply added flights at the alternate heliports without an equivalent reduction from the existing bases would not result in an overall reduction of flightseeing noise.

Please look at the maps with this summary. They show existing flightseeing routes and the proposed routes for the two recommended sites. The four candidates to make it through the Level 4 screening are: 1 -Montana Creek, 2 -Mendenhall Glacier Visitor's Area, 3 -Sheep Creek (Upper and lower being considered jointly as one candidate), and 4 -Dupont. For each site, we looked at noise (including impacts on trails), air safety, physical description (including environmental issues), infrastructure, ownership, and access.

Computer sound modeling, further in-depth analysis, and actual sound monitoring of helicopters making test runs at these sites were then used to evaluate each of the potential sites and result in the recommendation of two final sites. **The two recommended sites are Montana Creek (north) and Dupont (south).**

Currently there are 11,804 icefield landings permitted to the companies (Temsco, Coastal, and North Star Trekking) that fly out of the Juneau Airport and 7,235 icefield landings permitted for ERA Helicopters, flying out of their North Douglas base. There are 2,260 homes in the 6,000-foot noise corridors of the various flightseeing routes out of the airport and 3,777 homes in the 6,000-foot noise corridors for flightseeing tours out of the ERA base (Please see summary maps).

Moving northbound helicopter flightseeing operations to Montana Creek and southbound flights to Dupont would reduce the number of homes within the 6,000-foot noise corridors of associated flight routes from 6,037 to 0.

As indicated on the previous page, this does not mean that helicopter noise would not be audible at residences outside the noise corridors. All of those homes where helicopter noise would be audible, however, are currently within the noise corridors of existing flight lines and it is expected that noise levels for these residences would be reduced.

For the Montana Creek site, it is expected that flights would be audible for the three residences on Montana Creek Road and for some of the homes in the subdivisions near the Mendenhall Campground. The frequency of flights would increase for these homes, but the loudness of flightseeing noise would decrease.

For the Dupont site, there are 10 cabins (at Lucky Me and Marmion) which are currently in the noise footprint of the ERA flights and where the noise would still be clearly audible. For these cabins, the loudness would decrease, but the frequency of flights would increase. The Dupont site offers the potential added advantage of basing floatplane flightseeing flights there as well.

This study focuses on reducing the noise impacts of flightseeing. During the course of the study, and our discussions with the FAA, it became apparent that moving flightseeing operations to the Dupont and Montana Creek sites could also “clean up” Juneau air space by gaining greater separation between flightseeing traffic and jet and general aviation traffic.

In horrible hindsight, after September 11th, it appears that moving the flightseeing bases could also benefit air safety in another way. We probably all agree that “. . . it could never happen here.” The potential consequences, however, of a simple mechanical failure, a pilot having a stroke or heart attack, or a deranged passenger wrestling for the controls of a flightseeing aircraft would be significantly less if the aircraft is not flying over populated areas or taxiing in between cruise ships. The same separation of Dupont or Montana Creek flight paths from populated areas that cause the reduction in noise would also provide additional protection in the unlikely event of an air disaster.

Appendices

In addition to the body of this report, there is additional information in five appendices:

Appendix A is a compilation of the noise contours for the Dupont and Montana Creek sites.

Appendix B is a brief analysis of noise reduction that would result if the helicopter flightseeing companies switched their fleets to Eurocopter 130 or similar helicopters, and flightseeing floatplane operators retrofitted their planes with turbine engines. In both cases, some reduction in noise impacts could be achieved, but not as much as would be realized by moving base operations.

Appendix C presents additional material on vessels that that could be used to transport passengers to the Dupont site.

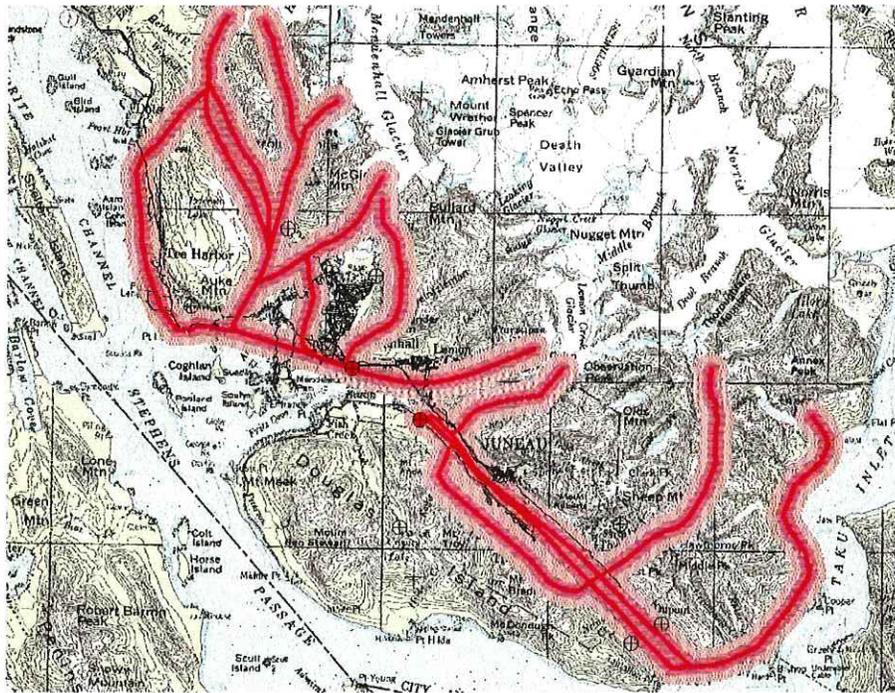
Appendix D is a brief analysis of the impacts of moving the base of operations for

flightseeing floatplanes from the Juneau Harbor to the Juneau Airport Floatplane Pond or to the Dupont site. Moving all floatplane operations to the Juneau Airport pond would cause a substantial net increase in the number of homes affected by floatplane noise, but moving flightseeing floatplanes to the Dupont site could offer economies of scale in developing the site and transporting passengers and could virtually eliminate floatplane flightseeing noise from the developed portions of Juneau.

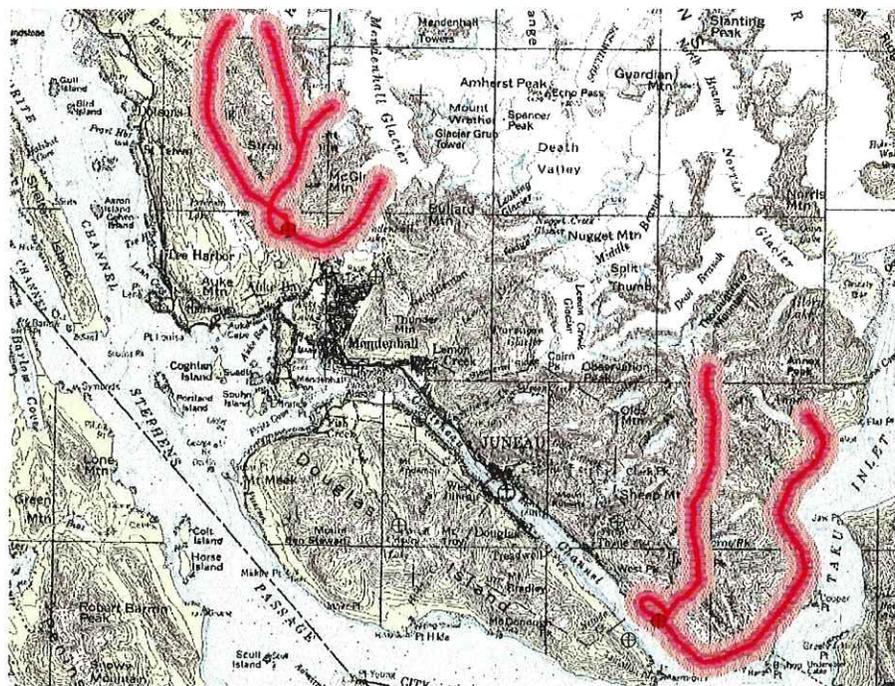
Appendix E is a glossary.



SUMMARY MAPS – Existing Helicopter Flightseeing Routes



Proposed Helicopter Flightseeing Routes from Montana Creek and Dupont



1.0 Methodology

1.1 Criteria

Listed below are the screening criteria for the evaluation of potential alternative heliports. The criteria focus on safety, noise, and impact on neighborhoods. A number of comments were received after the May 24th public meeting on criteria and were incorporated into the revised criteria listed below. At the end of this section is a summary table that shows how each site ranks against the main criteria categories. Not all criteria were weighed equally, but if a site received an unacceptable rating in any category, that precluded it from advancing to Level 4.

1.1.1 Exclusion Criteria

The first evaluation of all sites was against the exclusion criteria. If a proposed site would not be safe, was not large enough, or the landowner was unwilling to have the site considered, it would have been discarded and not be rated in comparison to other sites. All sites considered passed the evaluation against the following exclusion criteria.

- Safety
 - Airspace and Air Traffic
 - Clear approach and takeoff surfaces free of obstructions (trees, power lines, terrain) during approaches and departures.
 - No air traffic conflicts with existing flight routes that cannot be managed through company dispatch or FAA Air Traffic Control.
- Landside Access
 - Allows timely access by equipment for aircraft rescue and fire fighting, or has sufficient area for on-site firefighting and rescue facilities.
- Land Size and Availability
 - Area Size
 - Level area is large enough to support aircraft landings and parking, terminal/office, bus/auto parking, hangars, fuel storage and fire/rescue equipment if provided on site.
 - Land Availability
- The landowner (CBJ, USFS, private owner, etc.) is willing to consider sale, lease, or trade to the CBJ for use as a heliport.

1.1.2 – Rating Criteria

After the sites had passed the Exclusion Criteria, the next step was to rate each site against the following criteria:

- Noise -
 - Number of overflights above different noise levels
 - Time Above noise levels
 - Daily DNL and modified DNL
 - Use three levels of analysis
 - Overall number of homes exposed to the various criteria
 - Number of homes that would experience increased or decreased noise levels
 - Representative receptor analysis in various neighborhoods and areas to show how the noise may change.
 - Analyze increases and decreases of noise impacts on trails and recreation areas from flights or ground transportation
- Work with CBJ Community Development Department to analyze land ownership and future residential growth patterns.
- Traffic and Ground Impacts
 - Changes in traffic impacts caused by changes in the pattern of ground transportation
 - Increases and decreases in the number of homes exposed to noise from ground transportation (buses, employee vehicles, fuel trucks, etc.)
 - Increases or decreases in the number of homes exposed to noises from ground operations (amplified announcements, maintenance work, etc.)
 - Impacts on sewer, water, or other CBJ infrastructure
- Flight criteria (*once an site has passed the safety exclusion criteria, these criteria rate functionality of the site*)
 - Rate sites for potential weather constraints.
 - Based on available meteorological information, rate sites and associated flightseeing routes for potential weather problems (fog, low ceilings, turbulence) and amount of time the sites would be usable compared to existing sites and each other.
 - Evaluate sites for local wind conditions that may affect flight safety and operations.
 - Evaluate sites according to the criteria in FAA 150/5390-2A “Helicopter Design,” to ensure that the sites recommended are consistent with the standards. These standards include but are not limited to:
 - Do the sites contain sufficient area to function (parking, terminal area, apron area, maintenance hangars, fuel storage, etc.)?
 - How much site preparation is required to obtain a level site (remove surface irregularities)?
 - Do the sites have sufficient space and number of approach/takeoff paths?

- Do the sites have sufficient space for protection zones?
- Do sites have space for optional lighting and visual approach aids?
- Analyze the issues in preparing FAA Form 7480-1 Notice of Landing Area Proposal and potential impacts to Navigable Airspace at appropriate sites.
- Coordinate with FAA to ensure that the sites do not conflict with navigable airspace, this means:
 - Do the sites have potential hazards to navigation?
 - Are marking and lighting recommendations needed as a result of potential hazards?
 - Assess sites for obstructions (FAR Part 77 compliance).
 - FAR Part 77 “Objects Affecting Navigable Airspace” describes the imaginary safety surfaces over and approaching the facility. These surfaces extend from the ground into the approach/departure paths for the safety of the helicopter operators and individuals on the ground. The purpose of FAR Part 77 is to prevent siting a heliport near any building, tower, power lines, or natural terrain or vegetation that may interfere with the safe operation of helicopters.
- Economics
 - Evaluate sites in comparison to existing sites and each other in the following areas:
 - Ground transportation time and expense
 - Increase or decrease of flight times
- Site acquisition and development costs
- Environmental considerations
 - Each site was also given a quick screening and evaluated for relative potential of physical impacts of site development to cause environmental problems. Sites that emerged from the Level 3 screening were further analyzed to avoid potential NEPA fatal flaws.

1.1.3 Summary Site Rating Table

This table lists each of the potential sites and rates them as Very Good, Good, Fair, Poor, or Unacceptable in different categories. Each rating is a summary of a number of component factors in that area. In evaluating the sites, noise was the most important factor considered, but a number of sites that rated “Very Good” in the noise category were screened out because they were unacceptable in other areas.

Summary Heliport Site Ratings

Sites	Noise	Conflicts with future growth patterns	Traffic and Ground Impacts	Flight criteria	Economics	Site acquisition and development
Level 4 Sites						
Dupont	○	○	⊖	○	⊖	○
Montana Creek	○	○	⊖	⊖	○	⊖
Sheep Creek	⊖	○	⊖	○	○	○
Mendenhall Glacier	○	⊖	○	○	○	○
Level 3 Sites						
Auk Rec	⊘	○	⊖	⊖	⊖	⊖
Auk Rec Bypass	⊘	○	⊖	⊖	⊖	⊖
Eaglecrest Parking Lot	⊘	○	⊖	●	⊖	○
West Gastineau	○	○	○	○	○	●
Level 2 Sites						
Bridget Cove	○	⊖	○	⊖	●	○
Eaglecrest Rock Quarry	⊘	⊖	⊖	●	○	○
Herbert River	○	⊖	○	⊖	●	○
Hidden Valley	●	⊘	○	●	⊖	⊖
Little Rock Dump	●	○	⊖	⊖	○	⊖
Rifle Range Flats	⊖	○	⊖	⊖	⊖	⊖
Peterson Creek	○	⊖	○	⊖	●	○
West Douglas	○	⊘	○	⊖	●	●
Yankee Cove	○	⊖	○	⊖	●	○

Very Good



Good



Fair



Poor



Unacceptable



NOTE: The rating in each category is the sum of a number of subcriteria.

1.2 Companies and Flight Lines

The U.S. Forest Service regulates both the number and location of helicopter landings on Juneau Icefield glaciers. Baker worked with the Forest Service to use this information as part of our destination-based analysis of potential sites. The vast majority of flightseeing customers are from the cruise ships in the Juneau harbor. Their flightseeing destinations are primarily on the Mendenhall Glacier to the north and on the Norris Glacier to the south.

The Forest Service Land Use Designation of these two glaciers is Semi-remote Recreation. In its Draft Environmental Impact Statement on Helicopter Landing Tours of the Juneau Icefields 2002 –2006 (DEIS), the Forest Service identifies the Mendenhall and Norris glaciers as “high volume” zones, with use capped at 20,000 service days each, where a service day is defined as a day or part of a day on NFS lands for which an outfitter or guide provides goods or services, including transportation, to a client. The remaining zones, Herbert, Gilkey, Lemon and Taku, were “low volume” zones at 3,000 service days each.

Existing operators Temsco, North Star Trekking, and Coastal Helicopters currently operate from bases on Juneau Airport leased from the airport. ERA currently operates from the Douglas Heliport, a base it owns between North Douglas Highway and the Gastineau Channel, just northeast of the Bonnie Brae subdivision, and roughly across the channel from DIPAC, the *Juneau Empire*, and Bartlett Memorial Hospital.

The Forest Service’s DEIS describes the routes of the helicopter flightseeing companies that use the glaciers as follows:

TEMSCO Helicopters, Inc.

TEMSCO is currently permitted to operate on the Mendenhall, Herbert, Taku, Norris, Lemon, and Gilkey glaciers, as well as various locations in the backcountry zone, and is authorized a maximum of 8,800 landings. TEMSCO also has two assigned sites on Mendenhall Glacier for a temporary, portable shelter with a port-a-potty. Most of TEMSCO’s landing tours and associated activities occur on the Mendenhall Glacier.

In 1999 and 2000, TEMSCO, in partnership with Alaska Icefield Expeditions, offered the Icefield Flightseeing and Mushing Tour which included one landing on the Mendenhall/ Herbert glacier saddle.

Passengers departed the aircraft for a 1-hour, guided, dogsled mushing experience. The tour consisted of one to three helicopters flying together with approximately 1 hour between tours. Helicopters use a west departure to Auke Mountain to the Mendenhall Glacier or up the west side of the Mendenhall Valley over the Back Loop Road. The Heintzleman Ridge and Lemon Creek routes may be used when and if there are no opposing traffic conflicts.

TEMSCO currently offers icefield flightseeing tours combined with one or two glacier landings, as well as guided hiking and dogsled mushing tours. Glacier guides commute daily to the assigned sites to guide

tour passengers dropped off for their glacier activity.

TEMSCO also offers a Pilot's Choice Tour that, weather permitting, flies from TEMSCO's heliport west



to the ferry terminal then north to the icefield. After landing on two different glaciers, helicopters return along the same route or return through the Lemon Creek area or Taku Inlet, and up Gastineau Channel (see Figure 1-2). The Pilot's Choice Tour consists of one or two helicopters flying together with approximately 1.5 hours between tours for up to eight tours per day. Some of these tours also depart to the east, flying along Douglas Island, and following the same routes as ERA up Sheep Creek or around Point Bishop. The return route for TEMSCO is via Lemon Creek Glacier or from the west.

TEMSCO also offers the Mendenhall Glacier Tour, which flies from its heliport to the Mendenhall Glacier. This tour generally consists of five helicopters in a group flying every 25 minutes. The preferred route, weather permitting, is up Heintzleman Ridge and back. Other

flight routes used during low cloud ceiling conditions are either up the west side of the Mendenhall Valley, over the Back Loop Road, or over Auke Bay and up the eastern edge of Auke Mountain to Mendenhall Glacier. Of these two latter routes, the route up the eastern edge of Auke Mountain is TEMSCO's preferred route because they believe it creates less noise and visual impact to the residents of Mendenhall Valley. If weather permits, this route is flown first, with the Mendenhall Valley route as the last choice.

TEMSCO's Guide's Choice Extended Glacier Tour includes one glacier landing on the Juneau Icefield. Passengers are outfitted with hiking equipment and spend 2 hours exploring glacial features. This tour consists of one or two helicopters flying together, with approximately 2 hours between each tour. Helicopters use a west departure to Auke Mountain to the Mendenhall Glacier, or up the west side of the Mendenhall Valley, over the Back Loop Road. The Heintzleman Ridge and Lemon Creek routes may be used when and if there are no opposing traffic conflicts. All tour flights generally follow routes identified in the LOA, as discussed in Chapter 1 under the heading Laws, Statutes, and Ordinances.

Coastal Helicopters, Inc.

Coastal is currently permitted to operate on the Gilkey, Herbert, Lemon Creek, Norris, and Taku glaciers, as well as various locations in the backcountry zone. Coastal is authorized a maximum of 1,217 landings. Most of Coastal's landing tours and associated activities occur on Herbert Glacier, and involve walking on and experiencing the glacier environment, photography, and weddings.

Coastal's standard tour is the Icefield Excursion Tour, usually consisting of a single helicopter, but occasionally it flies a group of two helicopters. The tour is about 1 hour long, with one-fourth of the time spent on a glacier. Coastal also offers an Adventure Tour, which departs the airport to the west or north toward Gilkey Glacier and backcountry areas. This tour is approximately 1.5 hours long with one glacier landing. All tour flights generally follow routes as identified in the LOA with the FAA.

ERA Helicopters, Inc.

ERA is currently permitted to operate on the Norris, Taku, Lemon Creek, and Gilkey glaciers, as well as various locations in the backcountry zone. ERA is authorized a maximum of 7,235 landings. Most of ERA's landing tours and associated activities occur on the Norris Glacier.

ERA has one site assigned on Norris Glacier where it is authorized to occupy up to 3 acres and place temporary facilities for dogsled mushing activities.



These facilities consist of eight

to ten temporary housing facilities for the guides, as well as approximately 180 sled dog houses and other structures designed to blend in with the glacier environment. The dogs and guides live at the assigned site for the duration of the tourist season.

Many of ERA's tours leave its heliport on the west side of Gastineau Channel, fly up Sheep Creek to Norris Glacier, and return via Salmon Creek. Flights generally follow routes identified in the LOA with the FAA. ERA typically leaves every 30 minutes with two tours consisting of four helicopters in each tour. Other tours, predominantly the dogsled tours, leave in groups of three from a heliport site at the Juneau International Airport near the Wings of Alaska cargo area. All tour flights generally follow routes identified in the LOA with the FAA.

North Star Trekking, LLC

North Star is currently permitted to operate on the Mendenhall, Lemon Creek, Taku, Norris, and Gilkey glaciers, as well as various locations

in the backcountry zone. North Star is authorized a maximum of 1,787 landings. Most of North Star's landing tours and associated activities occur on the Mendenhall Glacier, but the other sites are regularly used when weather, snow, and ice conditions allow.

North Star offers four different flightseeing and glacier landing tour packages. The Glacier Discovery Tour involves one glacier landing and is approximately 2 hours long. The Glacier Trek Tour involves one glacier landing combined with a glacier trek that is 2, 4, or 6 hours long. North Star sets up a floorless expedition tent on the glacier surface for gearing up clients with glacier trekking gear. This tent is set up and taken down on a daily basis. The Icefield Explorer Tour involves two glacier landings and is approximately 2.5 hours long. The Overnight Glacier Adventure trek includes time to be outfitted with glacier gear and a flight to and from the glacier trek beginning and ending locations. The multi-day trekking activities take place primarily on the west side of the Mendenhall Glacier or on the Nugget Glacier, with a single camp and loop routes in the vicinity of the camp. Other multi-day trekking tours are conducted between the Lemon Glacier and lower South Branch of the Mendenhall Glacier. Participants set up and occupy temporary camps that they move with them as part of the trekking experience.

The primary flight routes originate from the Juneau International Airport. Arrivals and departures from the Juneau International Airport are conducted under an LOA with the FAA, but may deviate from this at the direction of the air traffic controller because of weather or conflicting traffic. Likewise, routes to, from, and over the glaciers/icefield vary due to weather and traffic conditions.

Flights to the Mendenhall Glacier, west end of the Juneau Icefield, and the Gilkey, Battle, and Thiel glaciers generally depart to the west on a Mendenhall departure, or a west departure, according to the LOA with the FAA. Mendenhall departures fly over the green belt area of the valley to the Rifle Range and either onto the Mendenhall Glacier or up Montana Creek to reach the Herbert Glacier and icefield. West departures fly over Auke Bay to the ferry terminal, then turn north along Spaulding Meadows for either Mendenhall Glacier or Montana Creek, proceeding to the Herbert Glacier and the icefield. Occasionally routes to the west continue further up the coastal area, as

far as Berners Bay, to access or return from the west end due to weather.

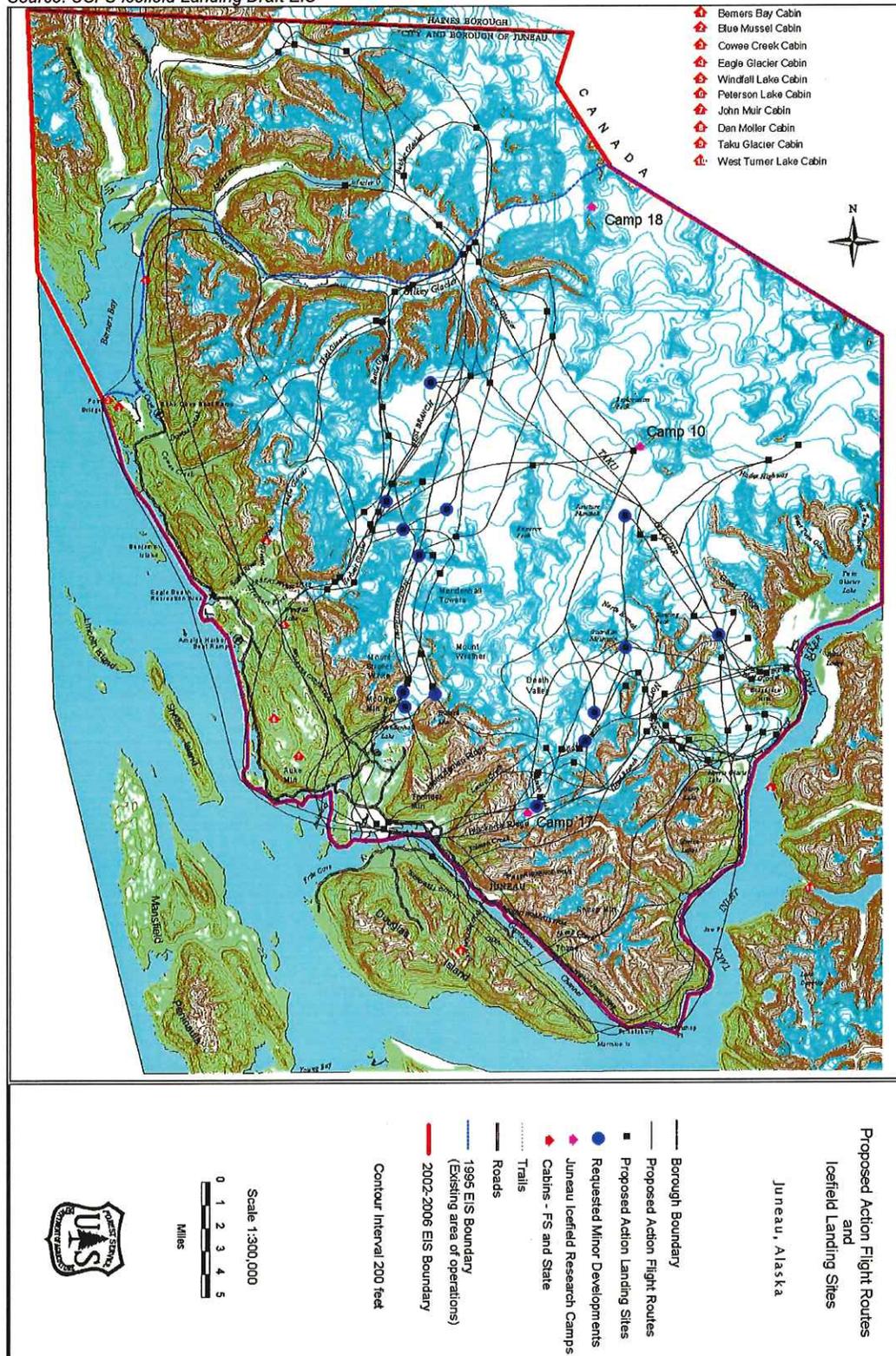
Flights to the Lemon, Norris, and Taku glaciers generally depart to the east, climb up the Blackerby Ridge side of Lemon Creek, and proceed to the sites at the east end of the Juneau Icefield. When weather conditions do not allow use of this route, the flight path proceeds east along the Douglas side of Gastineau Channel and either through Sheep Creek or around Point Bishop and up Taku Inlet. When weather allows, flights to the east end may depart or return via the Mendenhall Glacier or Spaulding Meadows route. Likewise, the west end trips may use the east route for either the departure or arrival.

Because the glacier helicopter landing sites and flightseeing routes tend to divide into north and south groupings, it seemed apparent very early in the study that the goal of relieving the maximum number of homes from flightseeing noise was best served by two sites (Please see Figure 1.1 – USFS Map – Proposed Action Flight Routes and Icefield Landing Sites). Analysis throughout the study reinforced this conclusion.

Northern flightseeing sites are reached primarily by flying routes that connect up the Mendenhall glacier or the Herbert glacier. Southern flightseeing sites are primarily reached by flying down the ridgeline of Douglas Island and over the mountains in back of Sheep Creek Valley in good weather, or down the channel and up Taku Inlet when the ceiling is lower.

Figure 1.1 – Proposed Action Flight Routes and Icefield Landing Sites

Source: USFS Icefield Landing Draft EIS



Analysis throughout the study reinforced this conclusion. Some commenters felt the Forest Service should be persuaded to change the locations of Icefield landing sites. The Forest Service's ability to do this however is limited by the Land Use Designations (LUD) of the Icefield and the accompanying restrictions. (Please see Table 1.1 – Maximum Recreation and Tourism Development Generally Allowed by LUD and Figure 1.2 – USFS Map of Land Use Designations (LUDS) and Requested Icefield Landing Sites)

Table 1-1
Maximum Recreation and Tourism Development Generally Allowed by LUD

Source: USFS Icefield Landing Draft EIS

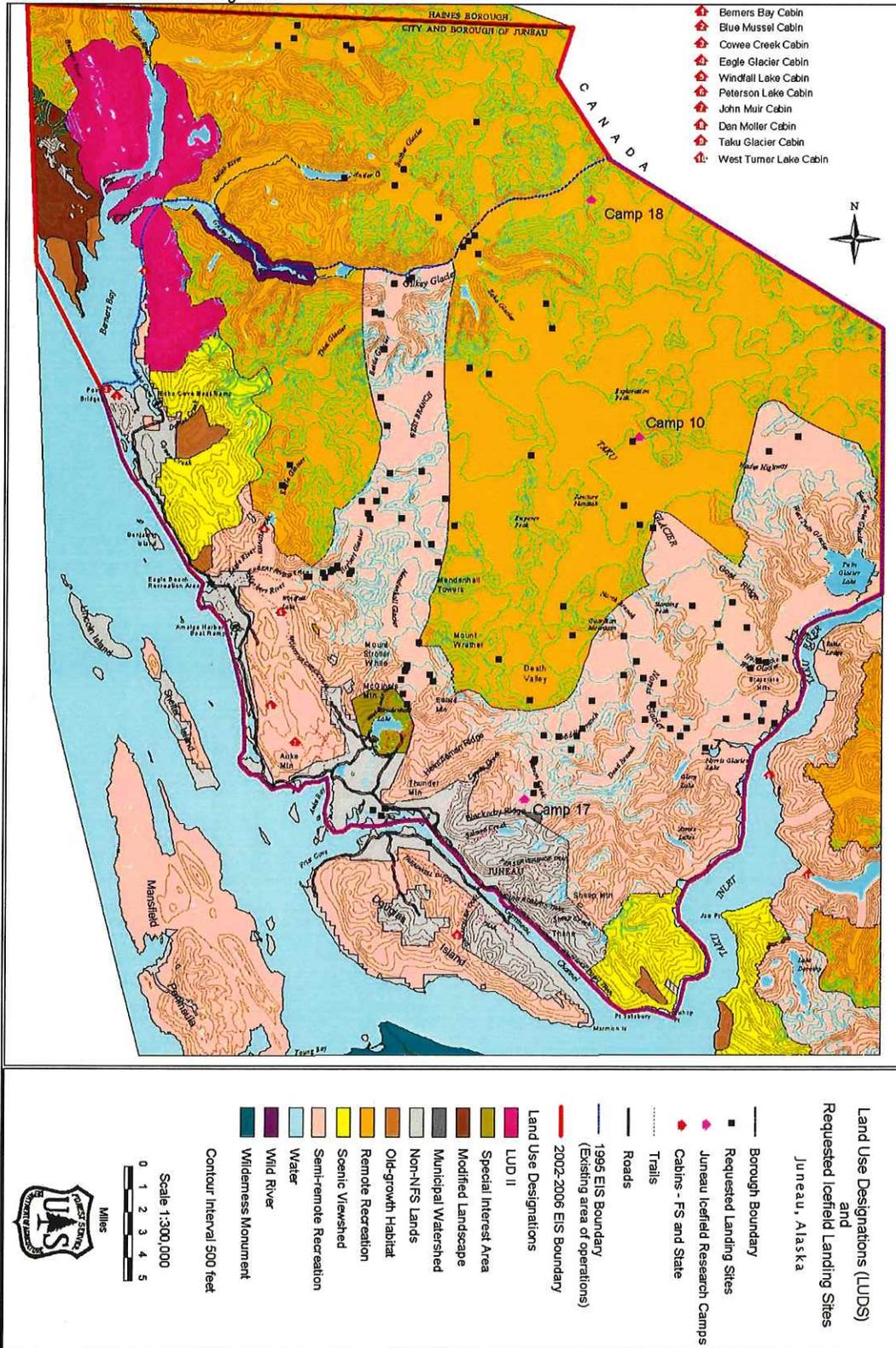
LUD	Number of overnight guests	Number of users per day	Number of landings per site per day
Remote Recreation	10	24	10
Semi-Remote Recreation	24/150 ²	50/300 ²	10/100 ²
LUD II	24	50	10

¹ The actual numbers authorized could be larger or smaller depending on site-specific analysis.

² The first number is for most areas within the LUD and the second is for enclaves of recreation and tourism developments. Source: Forest Plan, 1995 (page 4-40). See also Appendix B of this document.

Figure 1.2 – Land Use Designations (LUDS) and Requested Icefield Landing Sites

Source: USFS Icefield Landing Draft EIS



1.3 Noise Corridors

The essence of this alternate helicopter study is to determine whether there are sites that could dramatically reduce the number of households impacted by noise from helicopter flightseeing operations. Part of the evaluation of each site that made it past the first screening level was to compare the number of households that would be affected by noise from flightseeing helicopters going to and from their permitted landing sites from each of the potential sites.

To quantify this comparison, three thousand foot and six thousand foot corridors were drawn along the potential flight routes to the point where they were well past all human habitation (as a point of reference, 5,280 feet equal 1 mile). The number of residences within each of these corridors was then counted and compared. A single-family residence was counted as one, a duplex as two; a condo development equaled the number of individual units in the development.

These corridors do not contain all the residences that would hear helicopter noise from the flight routes. We estimate the noise level at the edges of the 3,000 foot corridor to be about 65 dBA (the level which starts to interfere with conversation) and at the edges of the 6,000 foot corridor, it is estimated that the noise level from the helicopter flights would be about 55 dBA (the level where aircraft are clearly audible). Last summer's noise study found that most residential areas of Juneau, away from major roads, have daytime L90 noise levels (the noise level that is exceeded 90% of the time) in the low 40s dBA. In a very quiet environment, distant helicopter noise down into the 30 dBA level is audible, but quieter than the ticking of a bedroom clock. The purpose of the noise corridors was to simply provide comparable data for all sites.

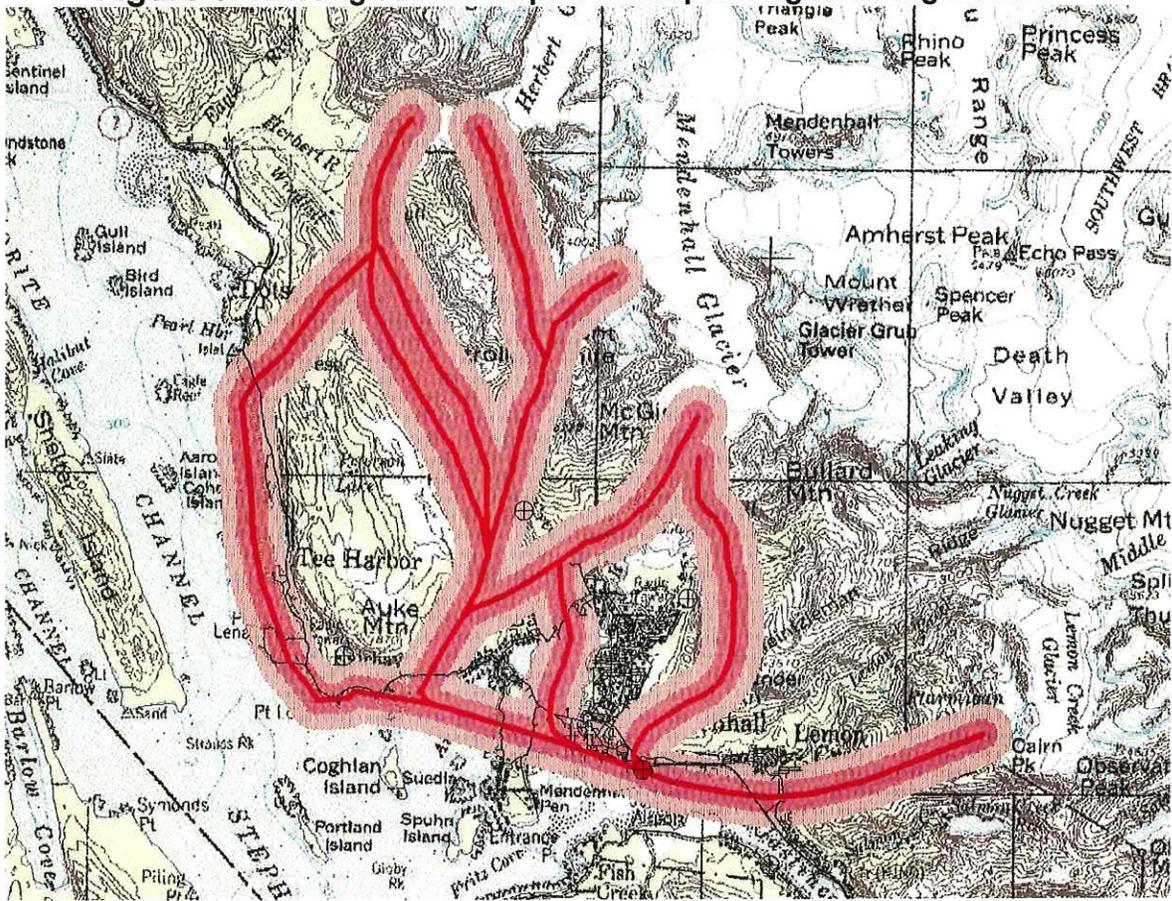
Many factors influence how sound travels. The altitude of the helicopter and whether it is climbing, flying at a steady altitude, or descending, affects helicopter sound. Wind, humidity, the existence and height of a cloud ceiling, topography, and ground cover also affect the distance at which noise can be heard. These factors are too variable to accurately factor, but again, for the purposes of this study, they are irrelevant. As mentioned earlier, unless alternate heliports offer dramatic reductions in flightseeing noise, they are not worth pursuing. A proposed solution that reduces noise for 1,000 people, but does so by inflicting an increased noise level on 600 others, would not be a solution at all.

In evaluating the impact of flight routes, we also considered on a case-by-case basis, the frequency the route would be used. Noise from five helicopters a day has a far different impact on residents than noise from fifty helicopters a day even if there is no difference in the maximum noise. If residences are impacted by floatplane flightseeing noise as well as helicopter flightseeing noise, the impact on residences is greater than the sum of the two parts.

Some sites offered good weather routes that would be heard by few if any residences. If these sites' bad weather routes would fly over an unacceptable number of homes, however, they were not advanced through the screening process. The analysis of all of the noise corridors is based on the presumption that while charter helicopter flights would continue to originate from the airport, all helicopter flightseeing would move to the alternate heliports. A scenario that simply added flights at the alternate heliports without an equivalent reduction from the existing bases would not result in an overall reduction of flightseeing noise.

The figures and table on the following pages show the existing heliports, flight lines, and corridor residence counts. Maps showing flight corridors for proposed sites are presented with the analysis of each site.

Figure 3 Existing Juneau Airport Helicopter Flight Seeing Routes

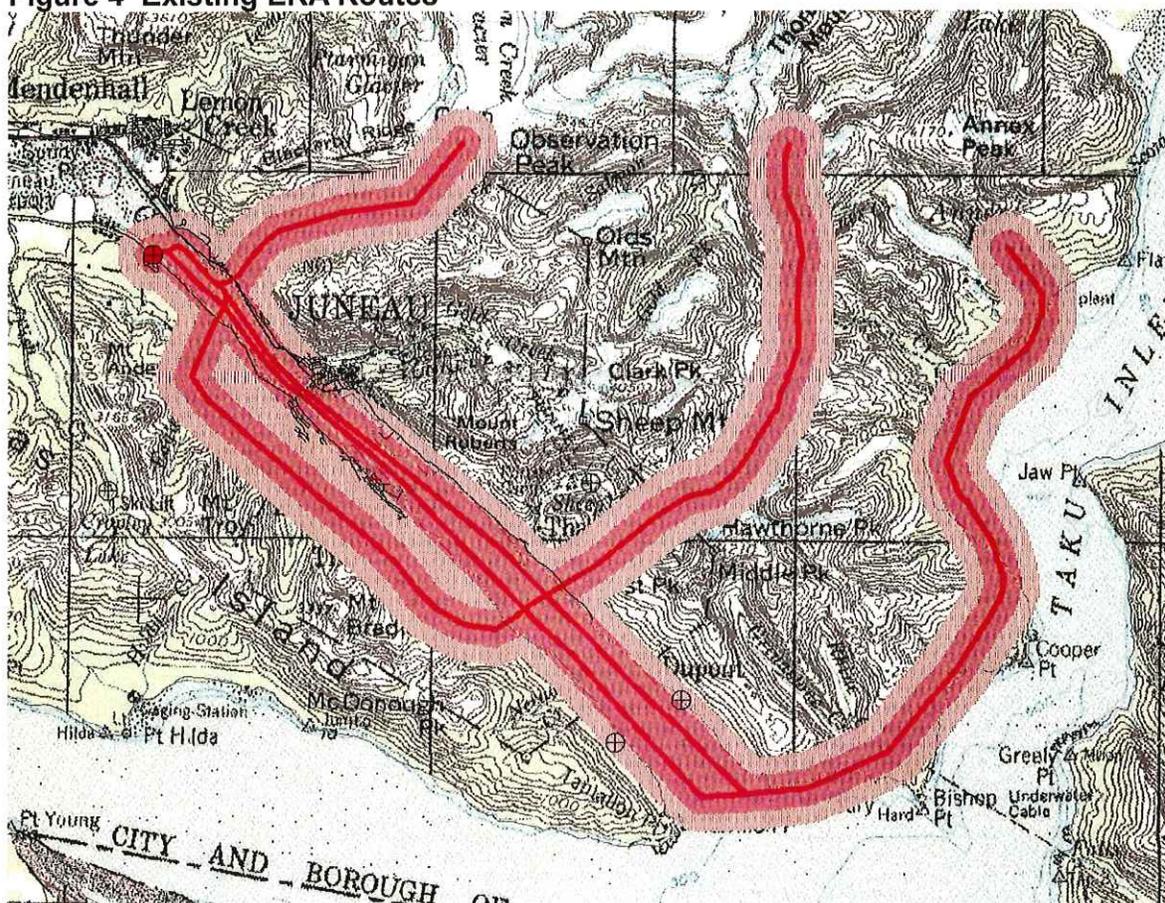


3000' Noise Corridors 6000' Noise Corridors

Affected Land Parcels	1098	2422
Affected Housing Units	841	2260

The parcel and housing unit totals are for all helicopter flightseeing routes out of the airport. The number of homes affected depends on the particular flight path.

Figure 4 Existing ERA Routes



3000' Noise Corridors

6000' Noise Corridors

Affected Land Parcels	1205	2783
Affected Housing Units	1779	3777

The parcel and housing unit totals are for all helicopter flightseeing routes out of ERA's heliport. The number of homes affected depends on the particular flight path.

1.4 Sound Modeling and Monitoring

1.4.1 Background

This Alternate Heliport Study used a noise measurement survey and computer modeling assessment to assess the suitability of various alternate heliport sites. The survey and assessment were based upon the methodology of our 2000 Flightseeing Noise Assessment and the results from that study were used to validate noise model conditions specific to Juneau. The following section details the methodology used in the measurement survey and the computer modeling of results into noise contours.

1.4.2 Noise Measurement Survey Methodology

The noise measurement survey was designed to provide actual noise data of helicopters operating along the flight lines that will be used if a heliport is established at one of the Level 4 heliport sites (Dupont, Montana Creek, Sheep Creek, Mendenhall Glacier). ERA and Temsco provided helicopters to fly along the new routes and a recording GPS was placed onboard to record the exact routes. This data was then compared to current noise levels from the existing heliport sites.

Four locations were used for measurement of the two southern heliport locations and four locations were also used for measurement of the two northern heliport locations. The monitoring locations were selected to measure the noise levels in the neighborhoods that might be affected by the alternative heliport sites. The locations were selected on the basis of: (1) proximity to proposed heliport flightseeing routes, (2) the proximity to noise sensitive land use areas, and (3) ambient noise levels.

Each of the sites is listed in **Table 4-1** on the next page. **Figure 4-1** shows the noise measurement sites in the south Gastineau Channel area. **Figure 4-2** is a map of the sites located in the Mendenhall Valley. The numbers of sites referenced in these figures correspond to the ones listed in **Table 4-1**.

Table 4-1 NOISE MEASUREMENT LOCATIONS

Site Name	Address	Neighborhood
South Gastineau Channel		
101	S101 Sandy Beach Parking Lot	Douglas
102	S102 Sheep Creek Delta	Thane/Sheep Creek
103	S103 End of Thane Road	Thane
104	S104 Lucky Me	Lucky Me
North Mendenhall Valley		
111	N111 Mendenhall Campground	Skaters' Cabin Area
112	N112 Gladstone St.	Upper Mendenhall
113	N113 Mendenhall Visitor Center	Mendenhall Glacier
114	N114 Community Garden	Montana Creek

Figure 4.1 Noise Measurement Location Map (Southeast Measurement Sites)

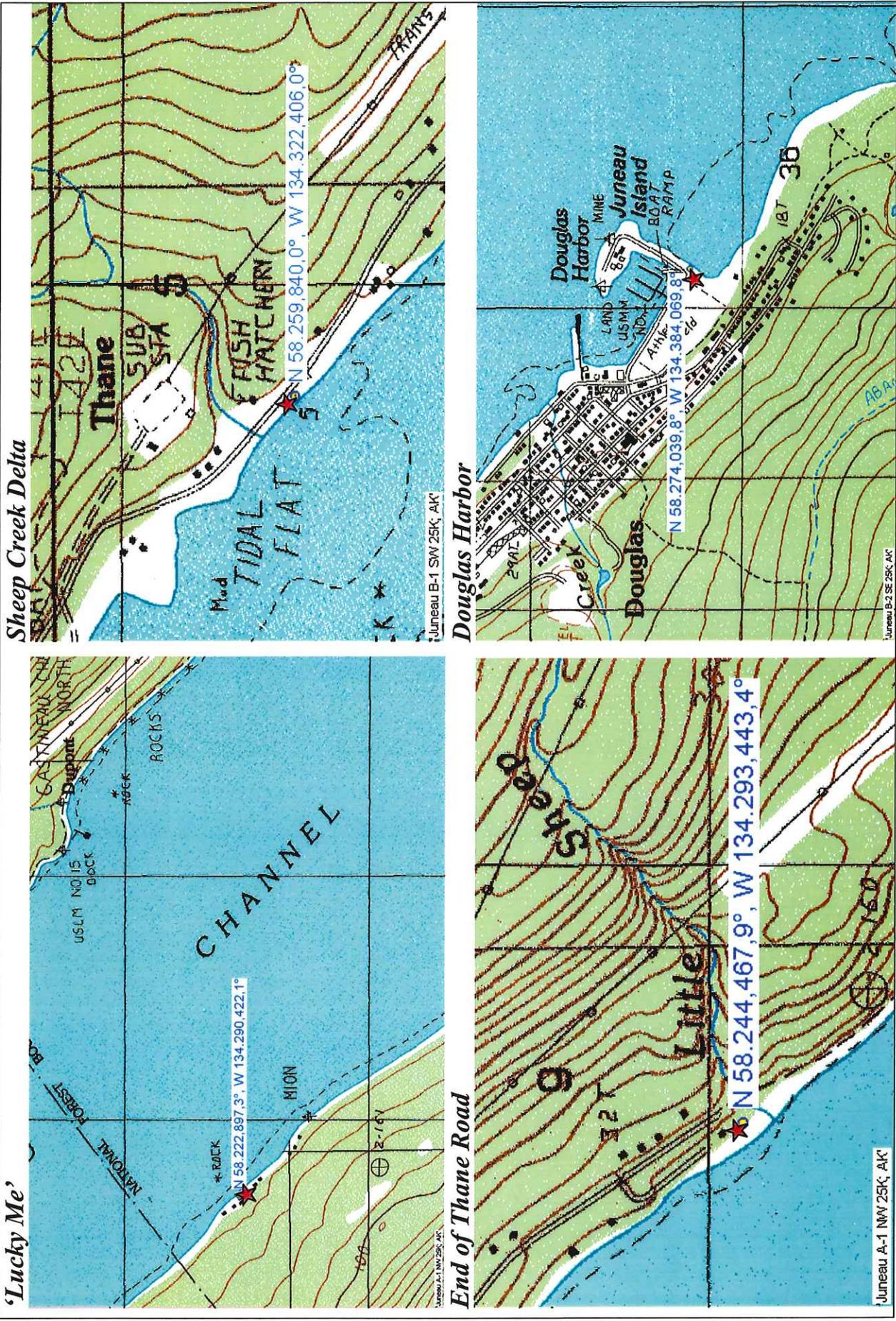
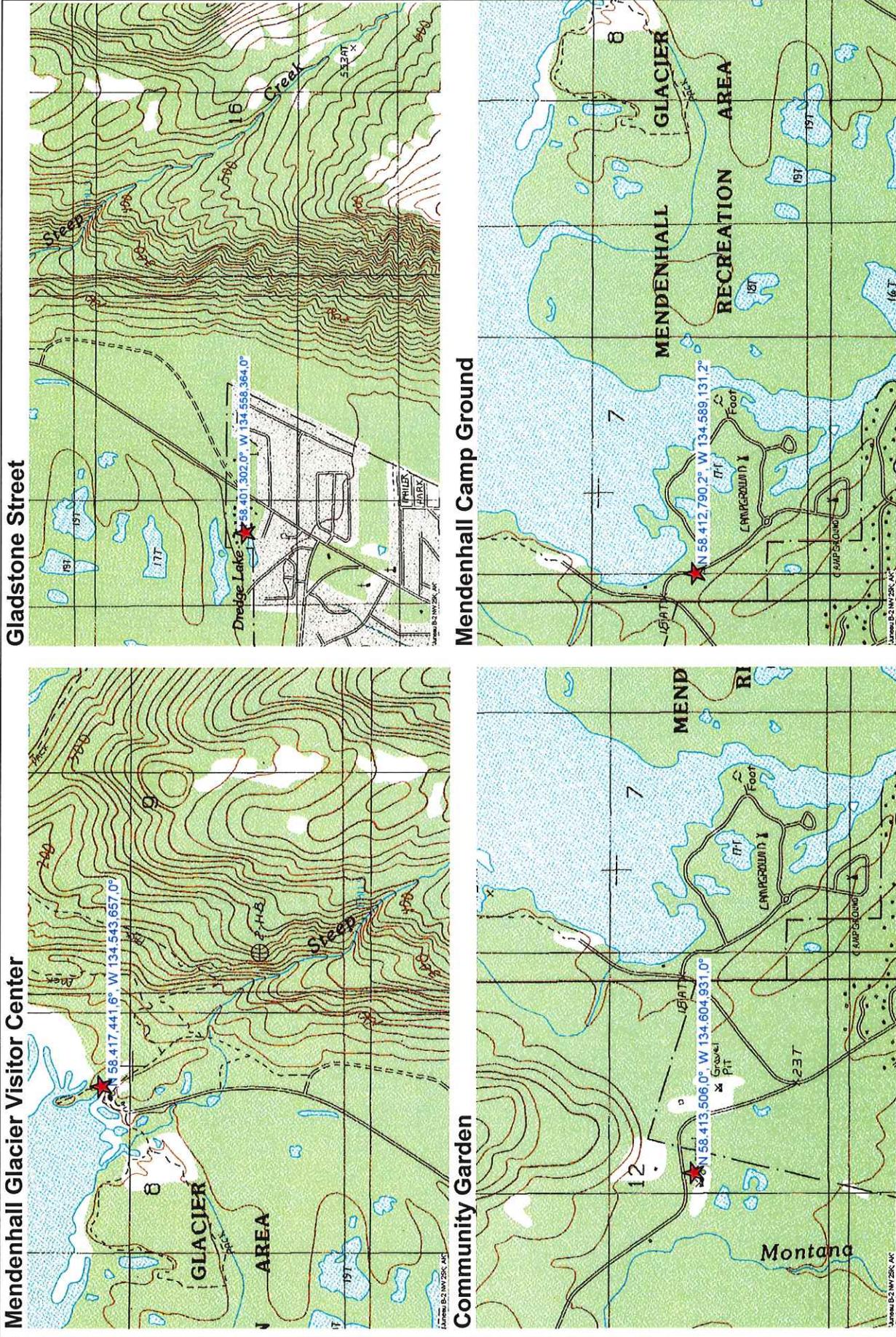


Figure 4.2 Noise Monitoring Locations for Montana Creek and Mendenhall Visitor Center Sites



Measurement Procedures.

Noise measurements were conducted on August 23rd, 2001 at each of the measurement locations. Monitors collected continuous 1-second LEQ noise levels, aircraft single event data, and ambient noise levels. The equipment was checked and calibrated at the beginning and end of the measurement survey.

At each noise measurement site, we collected the following data:

- continuous one-second noise levels
- single event data (SEL, Lmax and Time Above Duration) for individual aircraft
- hourly noise data (LEQ, Level Percent, Time Above)
- correlation of noise data with aircraft identification
- non-aircraft ambient sound level (Level Percent)

Instrumentation

The monitoring program was conducted with state-of-the-art noise measurement equipment and procedures. Each site utilized Brüel & Kjaer 2236 Sound Level Meters which automatically calculate the various single event data. The Brüel & Kjaer system also includes software that provides data storage for later retrieval and analysis. The measurements consisted of monitoring the A-weighted decibel in accordance with procedures and with equipment that comply with specific International Standards (IEC), and measurement standards established by the American National Standards Institute (ANSI) for Type 1 instrumentation.

Measurement and Analysis Procedures

The noise measurement methodology employed in this study uses a program designed to continuously measure noise at each location. From this data, different noise metrics, including aircraft single event noise event level, time above levels and the ambient levels, can be calculated.

Each noise monitor was staffed during the course of the noise measurements. Observers logged the time of different noise events that occurred during the measurement program. Aircraft operations during measurement periods were determined by software correlation between the recording GPS from the helicopter and the noise and time measurements from the sound monitors. This gave precise information as to the time and location of the helicopter in connection with noise

levels. This correlation was then double checked against the field notes of the observers conducting the measurements.

Once the collection and correlation of the noise and flight data was complete, the various noise metrics were calculated using proprietary software developed by BridgeNet. The results of the single event and cumulative noise metrics are presented for each of the alternative heliport sites.

1.4.3 Computer Modeling

Computer models are often used to predict changes to the noise environment that would result from development alternatives under consideration. The FAA's Integrated Noise Model (INM) Version 6.0b was used in this study to illustrate single event noise contour information. Inputs to the model were collected and validated so that they could be used to predict future changes in noise that would occur with potential alternatives. The INM includes an extensive database of civilian aircraft noise characteristics and the most recent version incorporates the advanced plotting features included in the Air Force's noise map computer model.

Noise contours were generated in this study using the INM Version 6.0b. The original INM was released in 1977. The latest version, INM Version 6.0b, was released for use in 2001 and is the state-of-the-art in airport noise modeling. The INM is a large computer program developed to plot noise contours for airports. The program is provided with standard aircraft noise and performance data for over 100 aircraft types that can be tailored to the characteristics of the airport in question. Version 6.0b includes an updated database that includes some newer aircraft, the ability to include run-ups and topography in the computations, and a provision to vary aircraft profiles in an automated fashion. It also includes more comprehensive and flexible contour plotting routines.

The results of the 2000 flightseeing noise measurements and the measurements completed in this study were used to validate the noise model to conditions specific to Juneau.

2.0 Heliport Management And Facility Requirements

2.1 Heliport Management

Flightseeing operators are reluctant to leave the Juneau Airport because of issues connected with funding and the operation of any proposed heliport. The grant agreements under which the airport receives federal assistance contain assurances that require a very “even-handed” approach to tenants and operators on the airport. The terms of FAA funding limit the ability of the City and Borough of Juneau to impose undue operational restrictions upon helicopter flightseeing operators different from those that apply to all users of the airport.

The CBJ has indicated that it wishes to own and control any future heliport sites. It must be pointed out that the City and Borough has no legal means to force operators to move to a new site; the current bases are licensed and functioning satisfactorily from an aviation standpoint. Instead, the operators must be offered the incentives necessary to agree to move their established operations that would ensure their continued long-term success. However, operators are reluctant to leave their current situation and move to a location where, as one operator explained, “Why would I move to a site where some future Assembly could limit me to flights on alternate Thursdays, between ten and two?”

To address these concerns and achieve common goals, we recommend that any new heliport sites be administratively regarded as part of the Juneau Airport system, and placed under the control of the existing Airport Board. The Juneau Airport management and staff have considerable airport management experience, machinery and resources. They are well versed in the requirements for airports of all types, and currently have 31 helicopters and 68 floatplanes on the field at the Juneau Airport. It would be easy to envision a significant management and operating savings under an aviation expertise already available for any new heliport facilities. FAA grant assurances, however, require that moneys generated at Juneau be spent on Juneau expenses; the Airport Board would need to be careful to fiscally separate Juneau Airport from the heliports to avoid potential issues of revenue diversion. The City and Borough would give up none of the controls presently enjoyed if these alternate heliport sites were placed under the umbrella of the Juneau Airport Board.

It would also be feasible to relocate the floatplane flightseeing operations at Juneau Harbor Seaplane base to the Dupont site. Procedures could be developed to incorporate the floatplane traffic for takeoff, landing and course reversal that would complement the helicopter flight operations. This would further reduce air traffic in the Gastineau Channel, and eliminate the potential conflict with paraglider activity. However, air traffic at the combined heliport/seaplane site may reach the level that would require full-time UNICOM advisory staff, or an air traffic control tower.

2.1.1 Capital Funding

Improvements at the Juneau International Airport are partially funded by the Federal Aviation Administration. Each passenger on a helicopter flight from the airport counts as a passenger enplanement, as are all airline and air taxi passengers. The total number of enplanements determines the “entitlements” portion of FAA grant funding for Juneau, and is one of the factors that determine the level of “discretionary” federal funding the airport receives. If flightseeing operations moved from the Juneau airport, federal grant funding to the airport would be reduced by about \$2.00-2.50 per passenger (about \$80,000-\$100,000) per year.

According to FAA Airports Division personnel in the Planning and Programming Section, airports and heliports must be included in the National Plan of Integrated Airport Systems (NPIAS) to be eligible under the FAA’s Airport Improvements Program (AIP). In order to be included in planning grants, the heliports must be addressing noise exposure that exceeds the national standard of 65 DNL, or be addressing a capacity issue as a part of a system of airports. Heliports must be open to the general public, as opposed to being limited to air taxi operators. The sites must meet standards for distance from other alternative locations, such as the Juneau Airport. These criteria make it unlikely, but not impossible, that the FAA AIP funding could be used for planning or construction of these alternative heliports.

Every site considered has a variety of capital costs associated with its construction. For some sites this is just the facility itself, except for four of the better sites, there would be associated infrastructure costs as well. The airport clearly does not have the funding necessary for such development. Though operators will have substantial costs associated with any move, an attempt to have them bear all the development costs associated with a new site would again cause the operators to be reluctant to move to a new site.

Funding sources are clearly a matter for the Assembly, but it would appear that the capital costs of the sites and related infrastructure would fit the requirements for projects eligible for funds from cruise ship passenger fees (CBJ Ordinance 69.20).

2.2 Facility Requirements

The available sites must provide adequate space for all functional areas of an alternative heliport. Currently, the two largest flightseeing operators each use about 15 American Eurocopter AS-350 "A-Star" helicopters. Other operators utilize the same aircraft for their flightseeing and air taxi operations. The new 7-8 passenger "high density" version of the EC-130, with its greater passenger load and quieter "Fenestron" enclosed tail rotor, is of significant interest to several of the operators; however, its dimensions are not substantially different than the AS-350, and will not change the dimensional requirements for heliport facilities.

It is recommended that any facility be designed to Public Use General Aviation standards under FAA Advisory Circular 150/5390-2A, Heliport Design. These standards are more demanding than the Private Use heliport standards, and are recommended since these are FAR Part 135 Air Taxi operations, and the general public will be the primary passengers. To accommodate the existing operations with some marginal room for expansion or relocation of other operators, the following facility requirements have been established for the alternate heliports:

General:

- Approximately 20 acres available (minimum)
- Relatively level or gently sloping grade
- Open on at least one side for protection zones, approach and departure paths
- No immovable hazards to navigation

Airside:

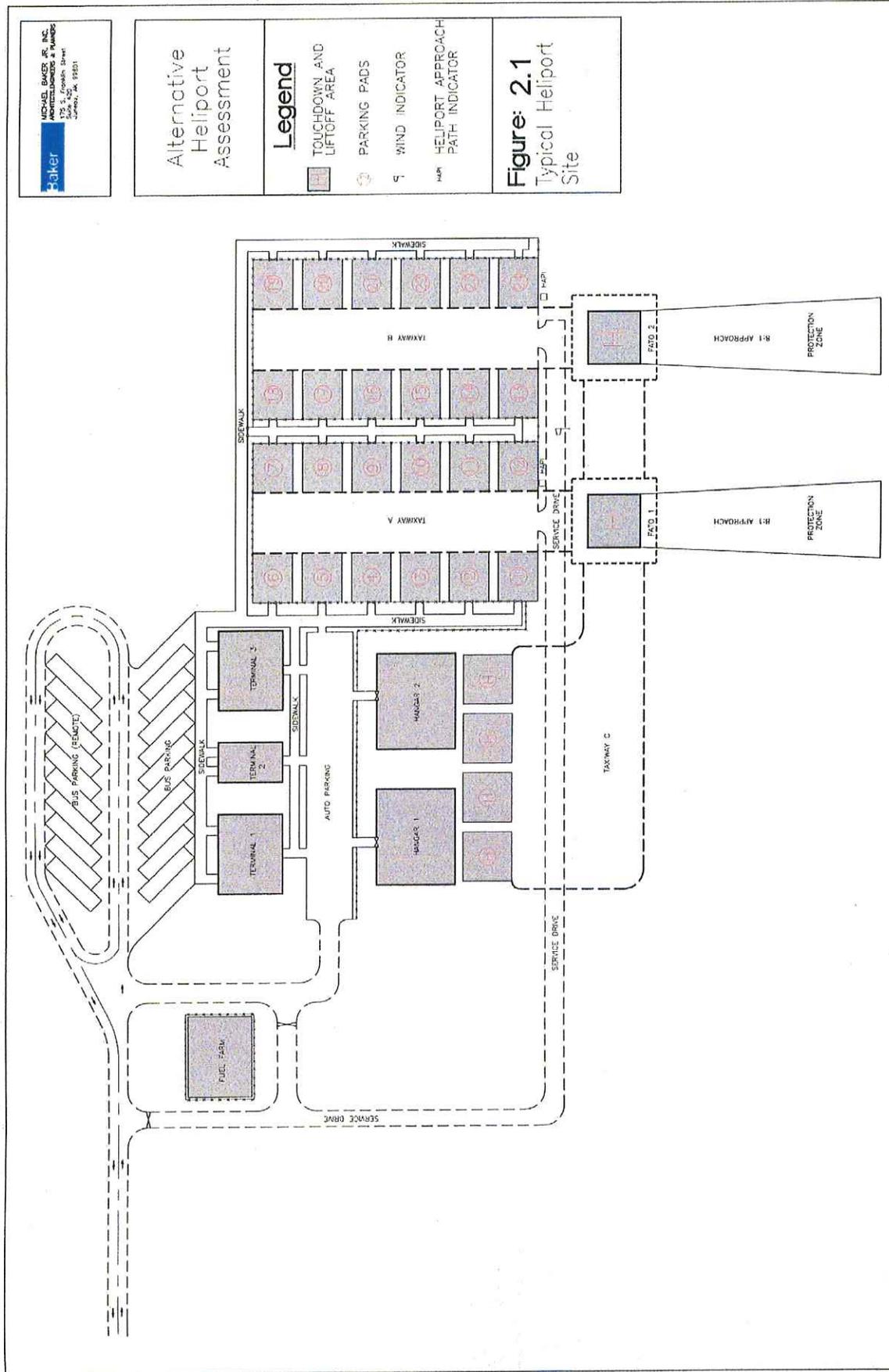
- Design Aircraft: AS-350 “A-Star”:
 - Overall Length: 43 feet
 - Main Rotor Diameter: 36 feet
 - Hub to Aft End: 25 feet
 - Undercarriage: 4.7 feet length, 7.1 feet width, skid-mounted
 - Max Takeoff Weight: 4,960 lbs.
 - Standard Fuel: 143 gallons, Jet A
- 24 helicopter positions: 62’ X 62’ each position
- Two (2) Final Approach and Takeoff Areas: 106’ X 106’ minimum
- Protection Zones: 106’ (min.) X 280’, 8:1 approach slope
- Approach Surface: 106’(W1) X 500’(W2) X 4,000’(L)
- Taxiway Width: 76 feet
- Other: FATO Lighting; Heliport Approach Path Indicators; Wind Direction Indicator; Heliport Beacon; Taxiway Lighting

Landside:

- Three Terminal Buildings: 16,000 SF total
- Bus Parking: 10 spaces at terminal buildings, plus remote staging
- Maintenance Hangars: Two, 30,000 SF total
- Fuel Storage: 32,000 gallons Jet A
5,000 gallons other (gasoline, diesel)
- Automobile Parking: 80 spaces (min.)

Two typical heliport site layouts have been developed for this report. Figure 2.1 shows a typical layout for a relatively “square” site, and Figure 2.2 show a typical layout for a relatively linear or “rectangular” site. Each site shown has the airside, landside and support facilities for a generic heliport to support the flightseeing operations, but would be tailored during the design process for each specific location.

Figure 2.1 - A typical layout for a relatively "square" heliport site



Baker
 MICHAEL BAKER JR., INC.
 175 S. Franklin Street
 Jersey City, NJ 07310

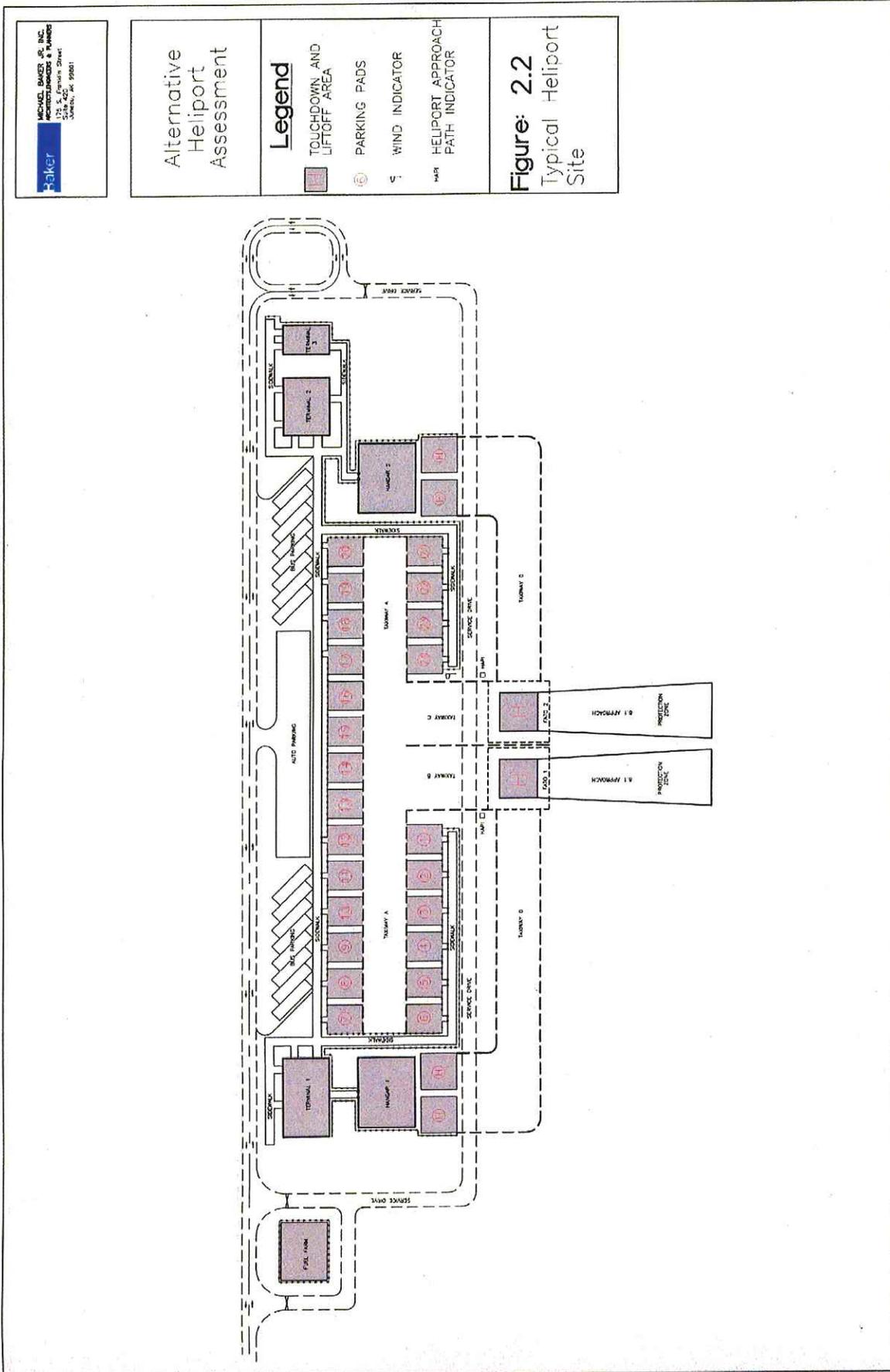
Alternative Heliport Assessment

Legend

- TOUCHDOWN AND LIFTOFF AREA
- PARKING PADS
- WIND INDICATOR
- HELIPORT APPROACH PATH INDICATOR

Figure: 2.1
 Typical Heliport Site

Figure 2.2 – A typical layout for a relatively linear or “rectangular” heliport site



BAKER
 MICHAEL BAKER JR., INC.
 ARCHITECTS, ENGINEERS & PLANNERS
 215 North 3rd Street
 Suite 240
 Jersey, NJ 07081

Alternative Heliport Assessment

- Legend**
- TOUCHDOWN AND LIFTOFF AREA
 - PARKING PADS
 - WIND INDICATOR
 - HELIPORT APPROACH PATH INDICATOR

Figure: 2.2
 Typical Heliport Site

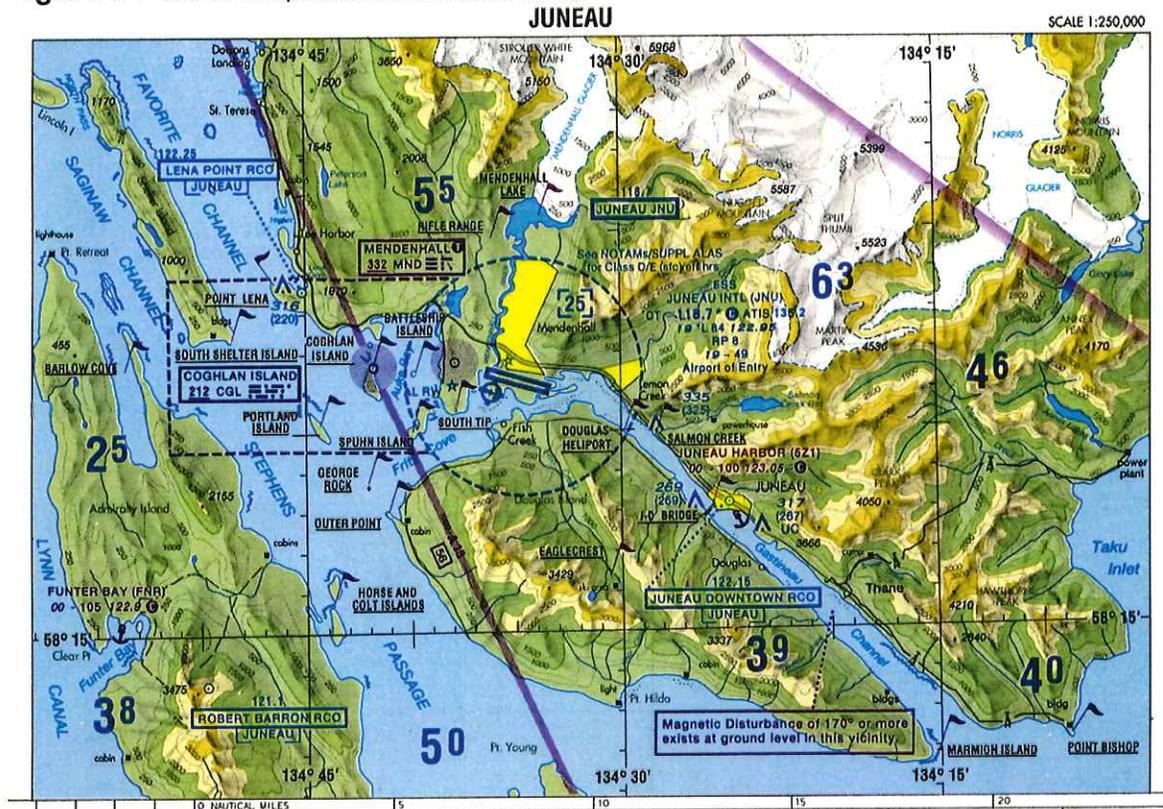
3.0 Flight Safety

3.1 Airspace And Air Traffic Control

The Federal Aviation Administration (FAA) has established several types of controlled airspace in the vicinity of Juneau International Airport (JNU), as shown in Figure 3-1. Immediately surrounding the airport is Class D airspace, from ground level to 2,500 feet MSL (mean sea level) and extending outward three (3) miles, which requires a clearance from the Air Traffic Control Tower (ATCT) to enter. Class E airspace extends westward across Stephens Passage, to south Shelter Island and northeast Admiralty Island, for control of the standard instrument approach procedures to Runway 8 during inclement weather. These approaches place the aircraft at 3,400 feet MSL passing Barlow Cove, to as low as 2,120 feet MSL at Coghlan Island, on the way to landing at the Juneau Airport. All standard departure procedures are directed westerly to the Coghlan Island non-directional beacon and Barlow Cove.

FAA's services are primarily limited to control of the airport and its immediate vicinity; en route and approach control for aircraft flying under Instrument Flight Rules (IFR) is provided by the Anchorage Air Route Traffic Control Center (ARTCC). Essentially all airline flights are flown under IFR, where the FAA is responsible for sequencing and separation during inclement weather. As for most of Alaska, there is no radar control in the Juneau area due to limitations of surrounding terrain; all instrument approaches to Juneau are handled in a non-radar environment.

Figure 3-1 Source: Excerpt of aeronautical chart for Juneau



Alaska Airlines has established a special GPS-based RNP (Required Navigational Performance) instrument approach procedure to Runway 26, where the final approach course is flown up the Gastineau Channel. This procedure requires special on-board equipment and crew training, and is flown by the aircraft autopilot, rather than by hand. This approach utilizes a 3.5 degree glide path to Runway 26; approximate glide path altitudes for this approach are:

- 5,500 feet MSL entering Gastineau Channel
- 3,700 feet MSL at Treadwell/Sheep Creek
- 2,500 feet MSL at the Juneau-Douglas Bridge
- 1,500 feet MSL at the Douglas Heliport

It should be noted that the FAA requires a minimum of 1,000 feet vertical separation (altitude) for IFR flights. Other aircraft must be cautious to avoid the

substantial wake turbulence trailing these large aircraft, which sinks below the aircraft's flight path. The airline also has developed a special departure procedure routed down the Gastineau Channel, which can operate simultaneously with an aircraft approaching in the opposite direction.

3.1.1 Weather Considerations

The weather is an important consideration in the suitability of various heliport sites and associated flight routes. In drawing conclusions about the weather and various sites, we reviewed weather records in the Juneau International Airport Master Plan and at Juneau's NOAA weather facility. These records reflect weather conditions at the Juneau Airport only. Cloud conditions are often significantly different and low ceilings more prevalent closer to the mountains and glaciers, but there are no records for these ceiling conditions. We also talked to operators who estimated how often they can or cannot use currently designated routes due to weather conditions.

The height of the ceiling is the primary factor that affects helicopter flightseeing operations. Due to their unique flight characteristics, helicopters may operate under ceilings as low as 300 feet. However, flightseeing operators typically cease operations when the ceiling is less than 1,000 feet as the sightseeing experience is severely compromised.



Good weather routes over the Douglas Island ridgeline, the back of Sheep Creek valley, and the ridgeline north of Mount Stroller White all depend on a ceiling in excess of 3,000 feet. These are the routes that would create the smallest noise impact to residents from a number of locations. Lower ceilings also increase the sound reflected to earth from helicopters. The highest ranked sites are not dependent on good weather routes to

achieve all or most of their sound reduction.

We reviewed the hourly weather observations at the NOAA weather facility for the months of May through September, 2000 and May through August 24, 2001 to record the number of days when the cloud conditions at the Juneau airport were either broken (6/10ths of the sky is obscured by clouds) or overcast (10/10ths of the sky is obscured by clouds) at the 3000 foot level, for at least half of the time between 8:00 a.m. and 7:00 p.m.

There were 5 days (17%) that fell within this category in May, 7 days (23%) in June, 12 days (39%) in July, 6 days (20%) in August and 11 days (37%) in September. For the 2001 season we found similar patterns; in May, there were 6 days (20%), 7 days (23%) in June, 6 days in July (20%) and 3 days (10%) through August until the 24th, when this research was concluded.

The Juneau International Airport Master Plan reports that Visual Meteorological Conditions (VMC) prevail 92.6% of the time, with ceilings greater than 1,000 feet above ground level and visibility of 3 miles or greater. It is typical for the area to have scattered and/or broken cloud layers with which to contend, even when VMC conditions exist. All flightseeing operations must remain clear of clouds.

Helicopters are typically more tolerant of gusty winds than fixed wing aircraft. Helicopter pilots prefer no-wind or slight headwind conditions for approach and departure, similar to fixed-wing aircraft. During the warmer months, the stronger winds predominately come from the northeast over the icefield. According to the flightseeing operators, there are typically one or two days per season when flights are cancelled due to high winds and turbulence in the mountains, between the existing bases and glacier destinations. However, winds are normally not an issue for the approach and departure routes during the flightseeing season.

3.1.2 Flight Rules

Most general aviation flights, and all flightseeing helicopter and floatplane operations, are flown under Visual Flight Rules (VFR), where pilots are responsible for their own navigation and separation from other aircraft. The FAA has established airspace sectors with separate En Route Common Traffic Advisory

Frequencies for communication between and among VFR aircraft (see Figure 3-2). These frequencies are provided for flightseeing operators as well as all other general aviation aircraft. The FAA also publishes a set of Visual Check Points as well as operating notes for the Juneau area due to the density of flight operations (see Figure 3-3). In addition, the flightseeing operators have established common conventions for their flight operations so that the pilots can monitor each other's flights.

Gastineau Channel. FAA's Juneau General Guidelines provide for flying on the right side of Gastineau Channel, monitoring the seaplane base frequency, and maintaining at least 1,500 feet MSL in heavy tour areas. Separate low-level altitudes (below 3,000 feet MSL) are recommended for entry and exit of drainages. Altitudes above 3,000 feet above ground level (AGL) are established under different FAA regulations.

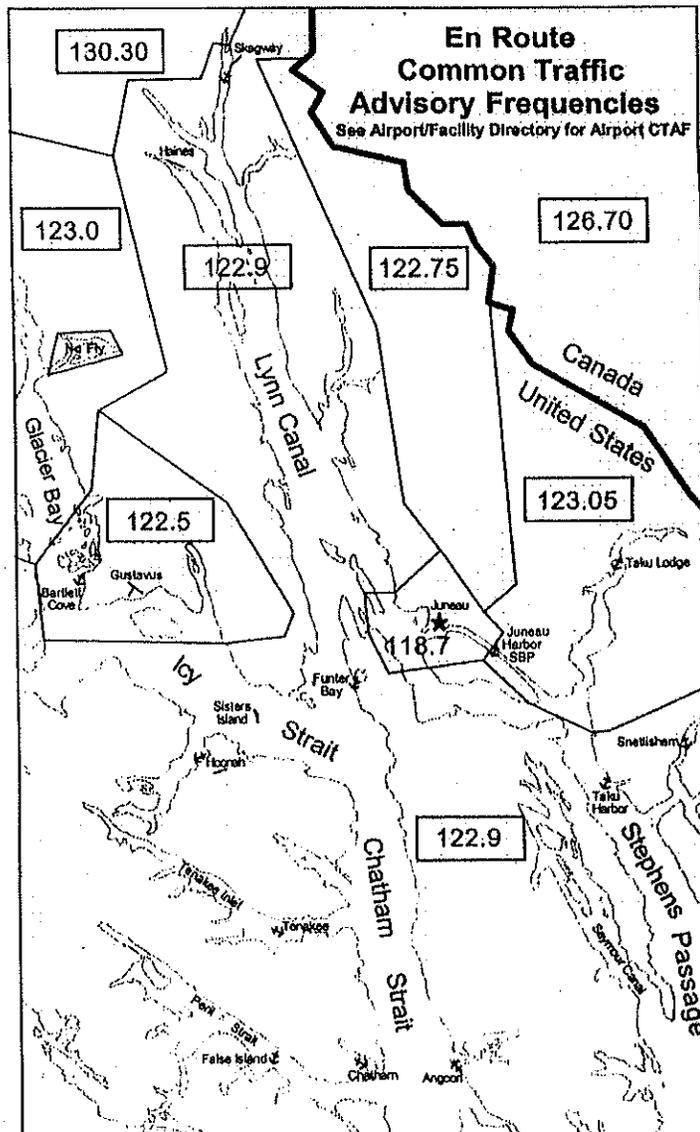
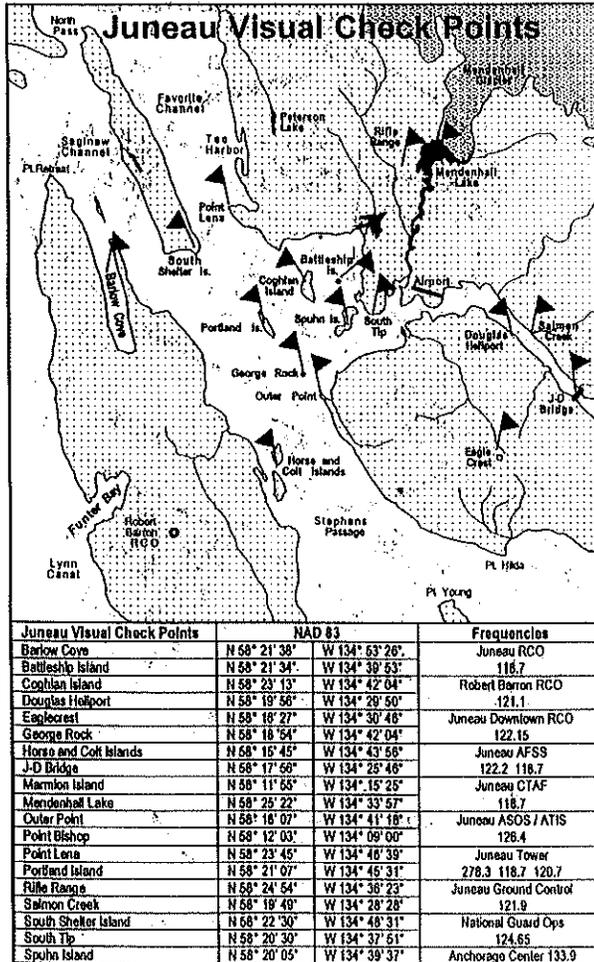


Figure 3-3 Source: Alaska FAA Flight Information Publication



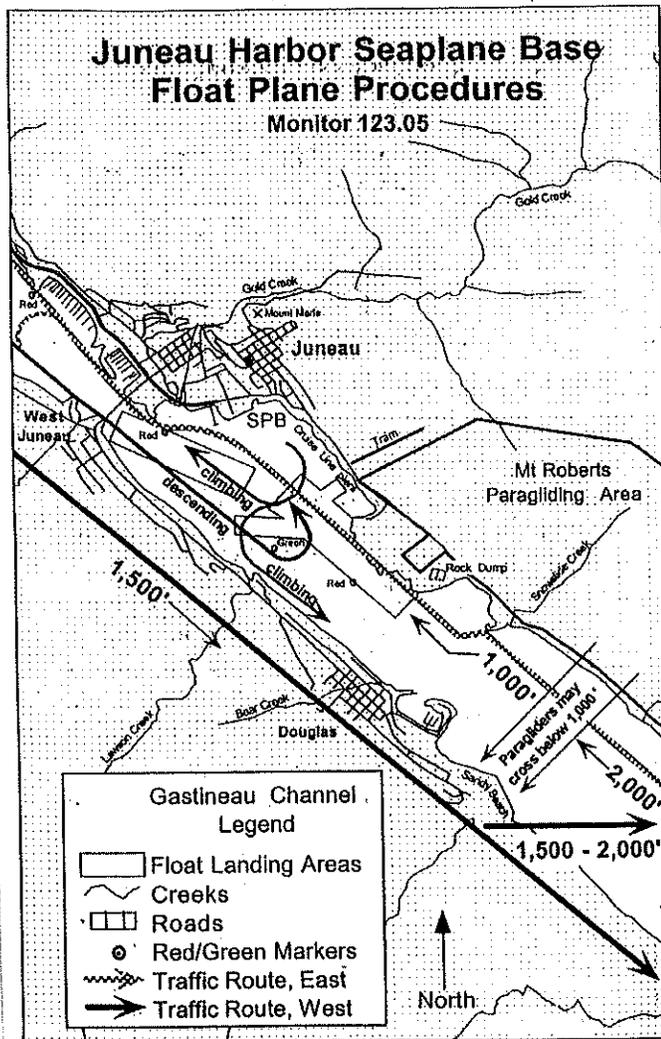
Procedures for the Juneau Harbor Seaplane Base provide guidance for floatplanes operating directly from the harbor. These procedures effectively require floatplane operators to climb to 1,500 to 2,000 feet MSL for separation from paragliders crossing the channel from Mount Roberts below 1,000 MSL (see Figure 3-3).

The Douglas Heliport is home to one of the principal flightseeing operators, ERA Helicopters, which flies routes southeast along the channel toward Sheep Creek and Taku Inlet. The heliport is barely outside of the Juneau Class D airspace.

However, its flight operations are so close that they affect aircraft operations at the Juneau Airport (and vice versa). ERA typically reports their flights to the FAA ATCT because of the proximity of their operation, and its flights are counted as “overflight” operations by the FAA control tower.

Figure 3-3 Source: Alaska FAA Flight Information Publication

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The other flightseeing companies (TEMSCO, Coastal, NorthStar) operate from Juneau Airport, where clearances from the FAA ATCT are required for takeoffs

and landings within Class D airspace. Their routes generally remain north and west of the airport, focusing on the Mendenhall and Herbert Glaciers, and minimizing conflicts with other VFR air traffic. Only one route over Blackerby Ridge is routed into the north end of Gastineau Channel; that route is initiated through controlled Juneau Class D airspace.

The FAA and Alaska Airlines want more control of the airspace within Gastineau Channel using the non-radar reporting system developed under the Capstone project. The FAA's Request for Proposals has been published for Phase II of the project covering Southeast Alaska, with an operational flight demonstration planned for January 2003. The FAA ATCT at the Juneau Airport will acquire an approach control function under this contract, which would primarily control the instrument approach airspace to Juneau Airport. This would leave the lower airspace "as is" for VFR traffic. The FAA Air Traffic Manager expects no problems with operators coordinating both rotary wing (helicopter) and fixed wing (floatplane) traffic in the south Gastineau Channel area; the relatively few operators currently work well together.

North Sites. From an air traffic standpoint, removing the helicopter operations from the Juneau Airport and placing them at either Montana Creek or the Mendenhall Glacier Visitor Center would significantly reduce the number of aircraft operations at Juneau Airport. The Juneau ATCT is currently a Level 5 facility, the lowest activity level for FAA air traffic control towers, with about 160,000 annual operations (takeoffs and landings). The Juneau Airport Master Plan estimates that of this total, about 30,000 airport operations (and 57,750 passengers) are helicopter air taxi operations. These include flightseeing as well as all other helicopter air taxi flights. Regardless of the level of activity, the control tower will likely remain at Juneau to support airline operations. Under a scenario of relocating the flightseeing operations from the Juneau Airport, the FAA may opt to replace the current FAA staff with a contract operation, but with no reduction in the services offered.

South Sites. With air carrier jets, helicopter, floatplane, paraglider and general aviation activity, operations in the Gastineau Channel can become quite dense. Most of the air traffic in the channel is VFR and outside of Juneau Class D/E

airspace. The FAA Air Traffic Manager at Juneau stated that relocating the ERA Helicopters operation to the Sheep Creek or Dupont area would significantly “clean up” the airspace in the channel. The FAA Air Traffic Manager reports that ERA’s flights are typically flown at 1,800 feet MSL when passing Sheep Creek/Dupont, well below the airline’s instrument approach and departure flight paths to Juneau. Relocating the floatplane operations to the Dupont area would further clear the airspace in the channel.

3.2 FAR Part 77

Federal Aviation Regulations Part 77, “Objects Affecting Navigable Airspace” sets the standards for determining obstructions to air navigation. It applies to existing and proposed manmade objects, objects of natural growth, and terrain. For these heliports, the purpose of this regulation is to prevent siting a heliport near any building, tower, power line, trees or terrain that may interfere with its safe operation.

Airport operators are required to meet these standards, which protect navigable airspace for airports, heliports and seaplane bases. Paragraph 77.29 sets the specific standards for the “airport imaginary surfaces for heliports.” These “imaginary surfaces” make up the protected airspace for each heliport approach/takeoff path.

The imaginary surfaces for heliports are:

- Heliport Primary Surface coincides in size and shape with the designated takeoff and landing area of a heliport. This surface is a horizontal plane at the elevation of the heliport.
- Heliport Approach Surface begins at each end of the heliport primary surface with the same width as the primary surface, and extends outward and upward for a horizontal distance of 4,000 feet where its width is 500 feet. The slope of the approach surface is 8 to 1 for civil heliports.
- Heliport Transitional Surfaces extend outward and upward from the lateral boundaries of the heliport primary surface and from the approach surfaces at a slope of 2 to 1 for a distance of 250 feet measured horizontally from the centerline of the primary and approach surfaces.

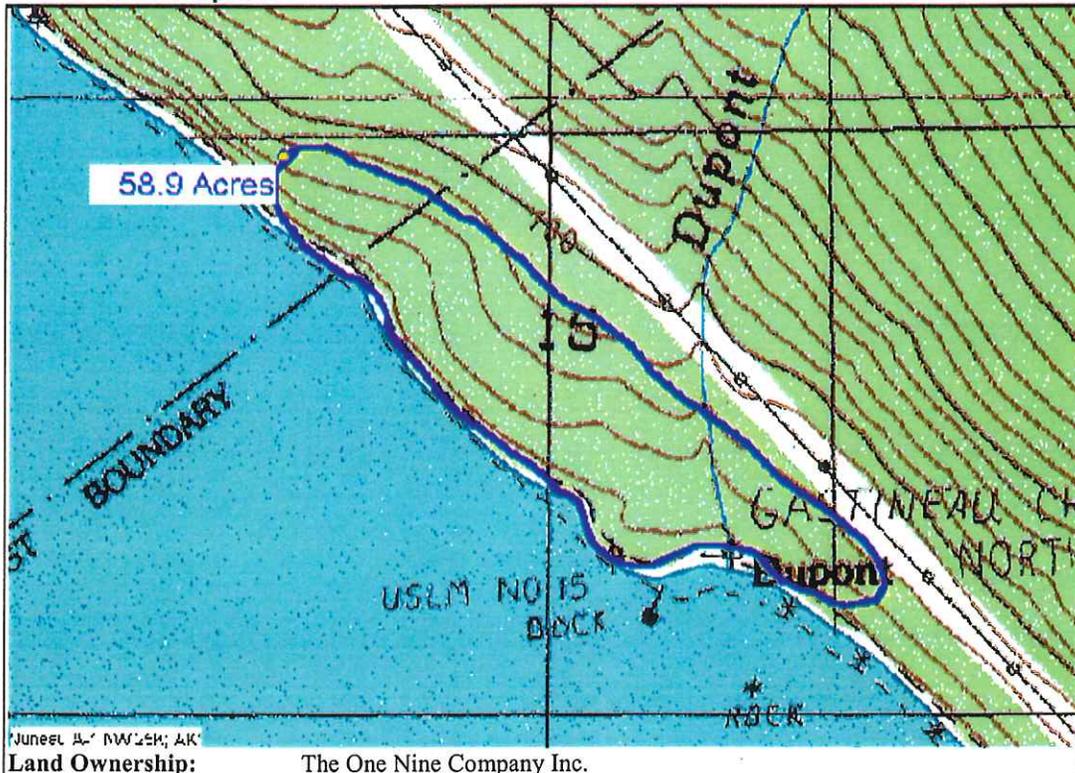
These surfaces are required to clear:

- 17 feet for an Interstate Highway;
- 15 feet for any other public roadway;
- 10 feet or the height of the highest mobile object for a private road;
- 23 feet for a railroad;
- For a waterway, the highest mobile object that would normally traverse it;
- The highest mobile object for any other traverse way not otherwise mentioned.

4.0 Alternate Heliport Sites

4.1 Recommended Sites

4.1.1 Dupont



Juneau, AK NW 25th, AK

The One Nine Company Inc.

Physical: 12 to 20+ acre site available Slope from 20' to 80'

Terrain: Gradually sloping timbered area along the east side of Gastineau Channel.

Features:

Adjacent Terrain: Gastineau Channel to the South and 837' mountain to the Northwest.

Features:

Existing Infrastructure: Electricity On-Site water needed

Access: 7.5 miles Marine Park 13 minute drive from Marine Park New 1.5 mile access road to end of Thane Road needed

Road Description: Thane Road is a winding two-lane road without a paved shoulder. It runs southeast from downtown along Gastineau Channel for approximately 5.4 miles.

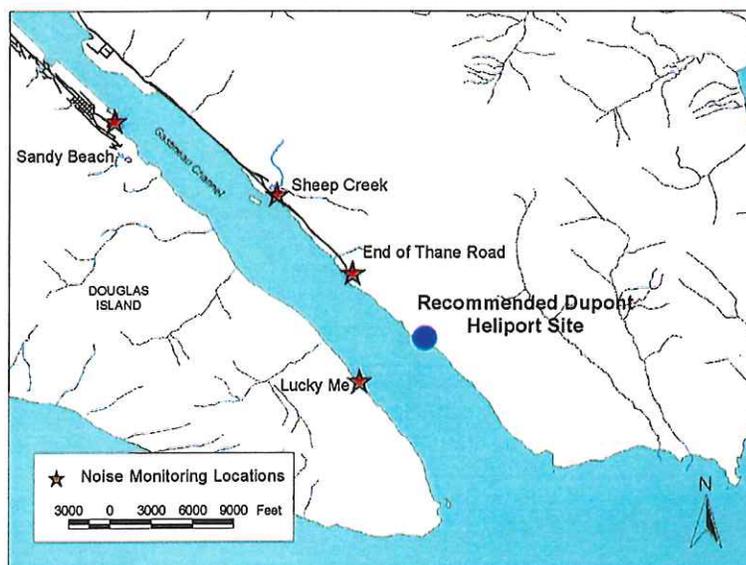
Type of Traffic route: Commercial traffic extends to the Sheep Creek Mine cut off. Residential traffic extends to end of road.

Nearest Fire Station: Downtown Juneau Fire Station, 8 miles

Noise

This is the recommended south site. Currently 3,777 residences are within the 6,000-foot noise (3,000 feet to either side of the flight line) footprint of the flight paths from the current ERA base. No residences are within the 6,000-foot noise footprint of flight paths from a Dupont base, however, seven cabins at Lucky Me are across Gastineau Channel, approximately 7,000 feet from the proposed site, and two are at Marmion across from the flight route. (see Figure 4.1.2 – Dupont flight routes)

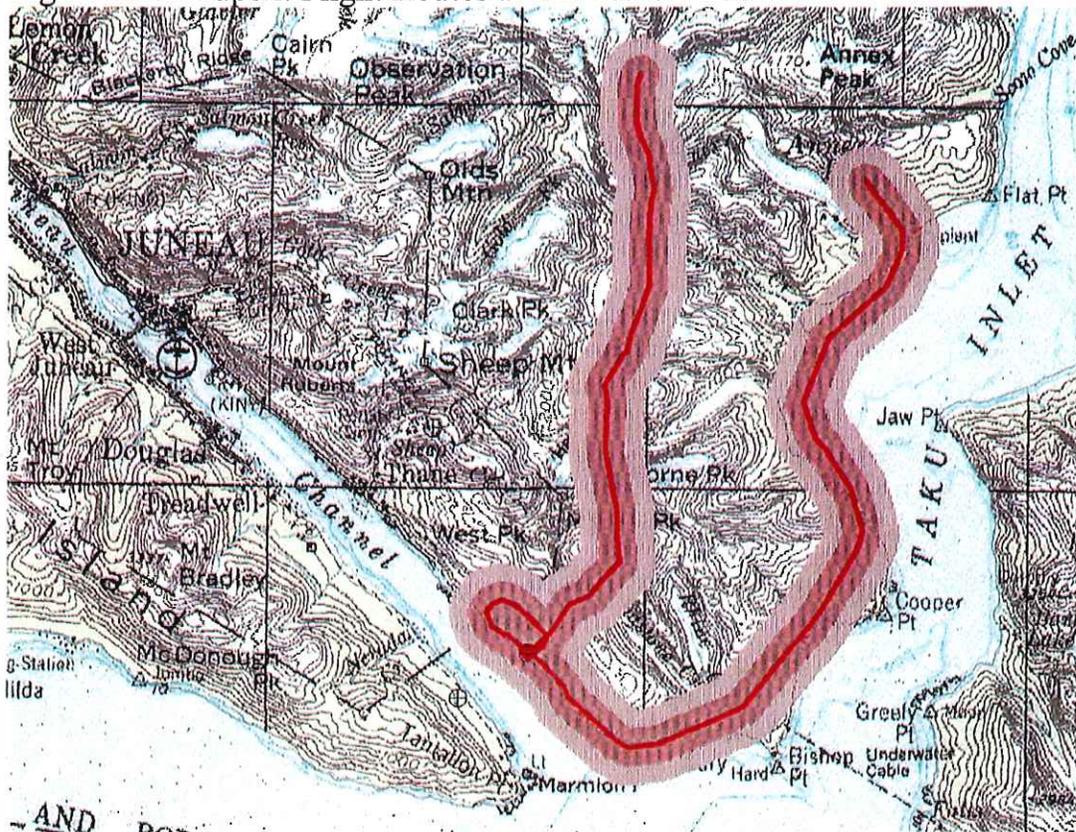
Because sound travels across water better than across land, sound levels reaching these cabins would be higher than if the cabins were a similar distance across land. Noise levels at Lucky Me were monitored at 59 dBA during helicopter takeoff and landing and 50 dBA while the



helicopter approached the Dupont site on the flight path that would be used. As a point of reference, floatplanes flying their standard route down the channel registered between 64 and 71 dBA at Lucky Me. (see Noise Measurement Results Table 4-1-1)

The sound of the helicopter approaching Dupont registered at 45 dBA on the beach immediately below the end of Thane Road. As points of reference, last year's noise study found the ambient level of noise in Juneau neighborhoods, away from traffic, ranged from 37 to 48 dBA. The recommended level for desired sound levels for bedrooms at night is 25 to 45 dBA. The ambient sound level at this monitoring site ranged from 41 to 51 dBA. Floatplanes flying their standard route down the channel registered from the mid 60's to mid 70's dBA at the end of Thane.

Figure 4.1.2 Dupont Flight Routes and Noise Corridors



	3000' Noise Corridors	6000' Noise Corridors
Affected Land Parcels	12	13
Affected Housing Units	0	0

The sound of the helicopter landing and taking off at Dupont was not audible (N-A) from the end of Thane monitoring site and no helicopter noise connected to the Dupont site or flight path was audible at the Sandy Beach parking lot, immediately above the launch ramp.

The Point Bishop trail is already heavily impacted by flightseeing noise. If the heliport were moved to Dupont, the portion of the trail between the end of Thane and Dupont would see some decrease in aircraft noise. This is the portion of the trail that currently receives the heaviest use, but is also the portion that would probably disappear if a road were built to Dupont. Noise impacts to the portion of the trail from Dupont to its end would likely increase by 25 to 50 per cent. The current flightseeing noise impacts to the

Sheep Creek trail and valley would no longer exist.

Table 4-1-1

Noise Measurement Results (Maximum dBA)

Dupont Heliport Site N-A is Not Audible

Time	Procedure	Sandy Beach	Sheep Creek	End of Thane	Lucky Me
		S101	S102	S103	S104
13:04	Approaching Dupont along flight path	N-A	N-A	45	50
13:05	Landing at Dupont	N-A	N-A	N-A	59
13:06	Takeoff from Dupont	N-A	N-A	N-A	59

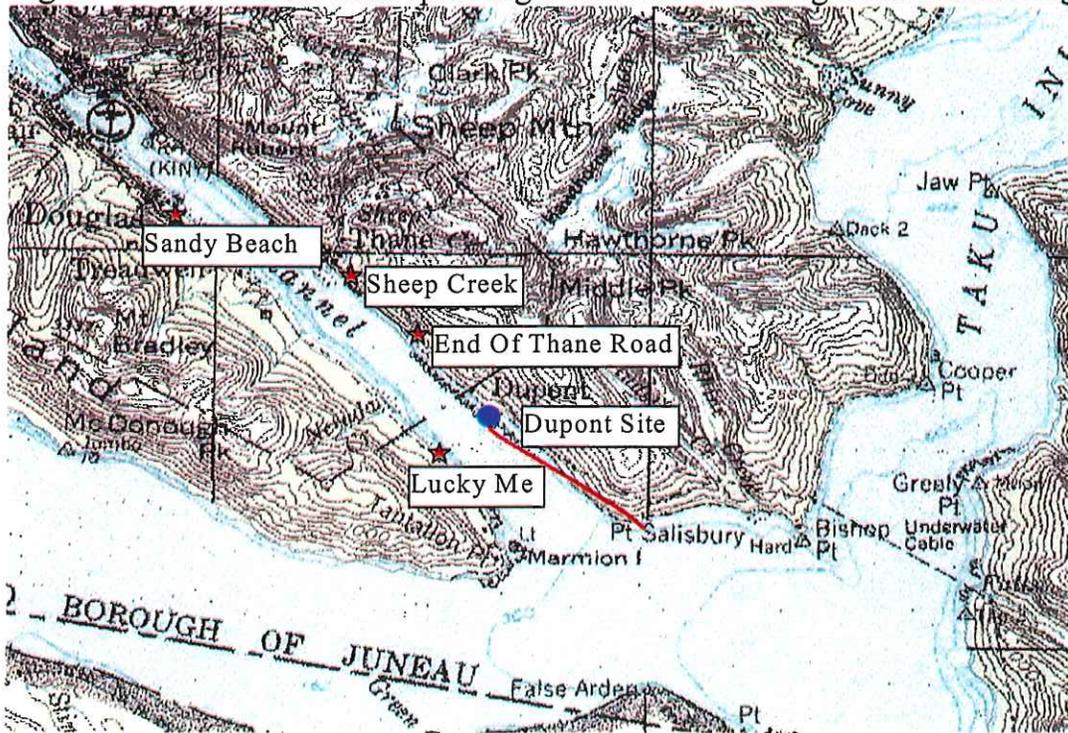
Air Safety

In evaluating this section, it is helpful to have read the Gastineau Channel and Southern sites subsections of the Air Safety Section of this report. Since it is located along the Gastineau Channel, the Dupont site's airspace is relatively clear along the channel side (northwest and southeast), as well as for approximately one mile across the channel to the southwest, except for maritime traffic. The normal large ship route down the middle of the channel is approximately 2,500 feet from the east bank at that location; the 8:1 approach surface would clear about 300+ feet over the ship route, which would clear the channel for cruise and cargo ships. The FAR 77 heliport approach surfaces could also be placed in south-southeasterly and west-northwesterly directions, angling into the channel to avoid ship traffic.

Being at a relatively low elevation, the site would remain below most of the low scattered or broken ceilings that tend to make up the inclement weather in the area. With the ridgeline behind the site, the stronger northeast winds would be a relatively small factor for the site.

It is approximately 14 miles from the Juneau Airport along the final approach course to Runway 26 (or departure course from Runway 8). At 2.0 miles from the entrance to Gastineau Channel, approaching airline jet aircraft would be at approximately 5,000 feet MSL; departing flights would be higher. Therefore, there would be no airspace conflicts with Juneau airspace or IFR approach/departure procedures.

Figure 4.1.3 shows the helicopter flight route flown during noise monitoring.



The Dupont site would be able to meet the requirements in FAA AC 150/5390-2A Heliport Design given that:

1. the site has sufficient area for the functional elements of an alternative heliport;
2. the site has a relatively gradual grade for site preparation; and
3. there are sufficient areas for approach, departure and protection zones.

Physical Description

The Dupont site is located approximately 7.5 miles southeast of downtown Juneau, and 1.5 miles past the end of Thane road, on the northeast side of the Gastineau Channel at the mouth of Dupont Creek. The site is gradually sloping and linear along the edge of the channel at an elevation of 20-80 feet MSL, with 2:1 slopes to the northeast toward a ridgeline at 2,000 to 3,000 feet MSL. The site has about 59 acres where the slope is moderate enough for heliport use and is open to water toward the southeast.

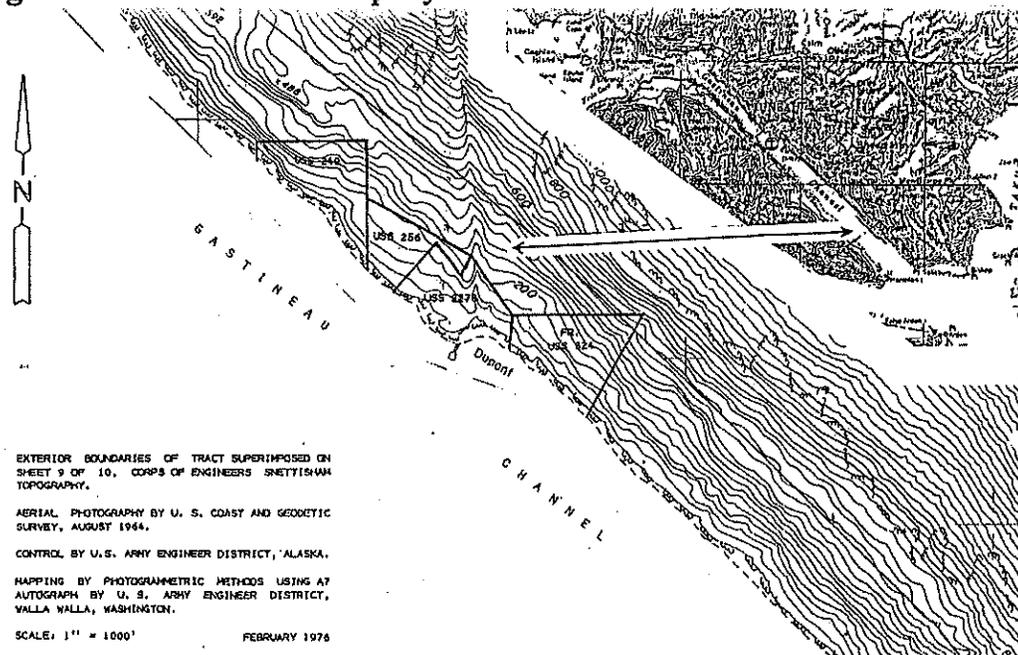
Dupont Creek runs through the area but the heliport could be located away from it. There are no environmental considerations with this site that would

seem to pose a bar to the use of this site for a heliport.

Ownership

The Dupont site is on approximately 100 acres of land owned by the One Nine Company, a group of Juneau citizens who have owned the land since 1975. Representatives of the company have indicated they would be willing to talk to the CBJ regarding sale of all or a portion of their land. (See Figure 4.1.4)

Figure 4.1.4 One Nine Company Land



Infrastructure

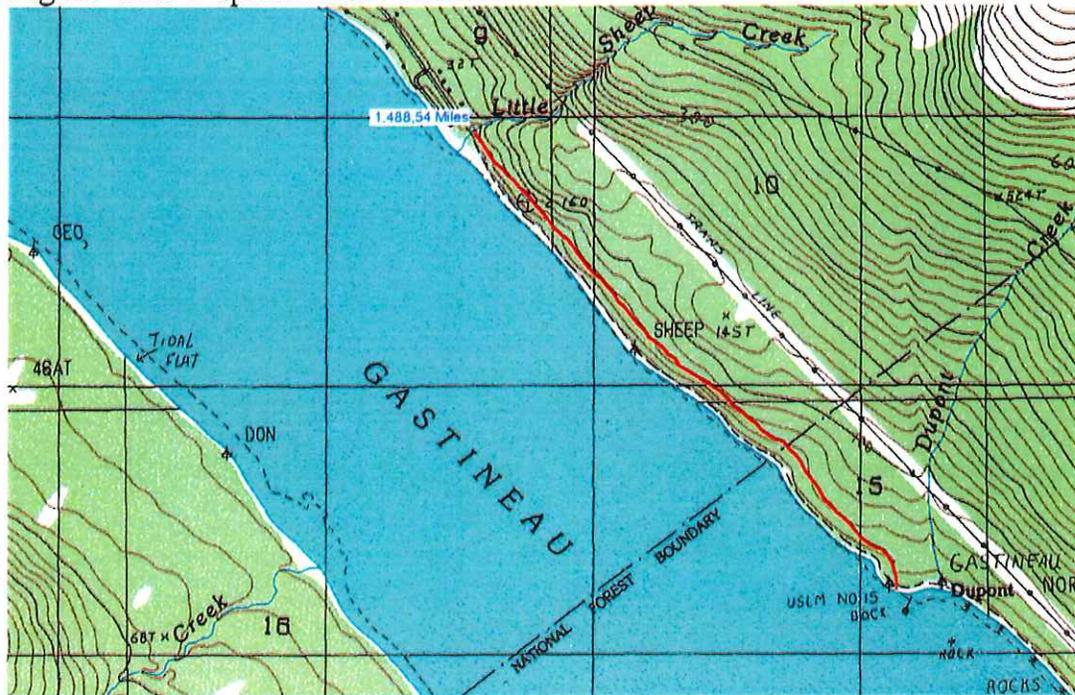
The main electric line to Juneau passes directly behind the Dupont site. A facility water and septic system would be needed.

Access

There are two alternatives to access for the Dupont site. The first is by land, the second by sea. Thane road is a two-lane winding road without a paved shoulder that leads down Gastineau Channel to end approximate 5.4 miles southeast of downtown. To reach the site by land would require approximately a mile and a half extension beyond the end of Thane Road.

The route of the extension would be along a moderate slope with one significant V-notch to bridge.

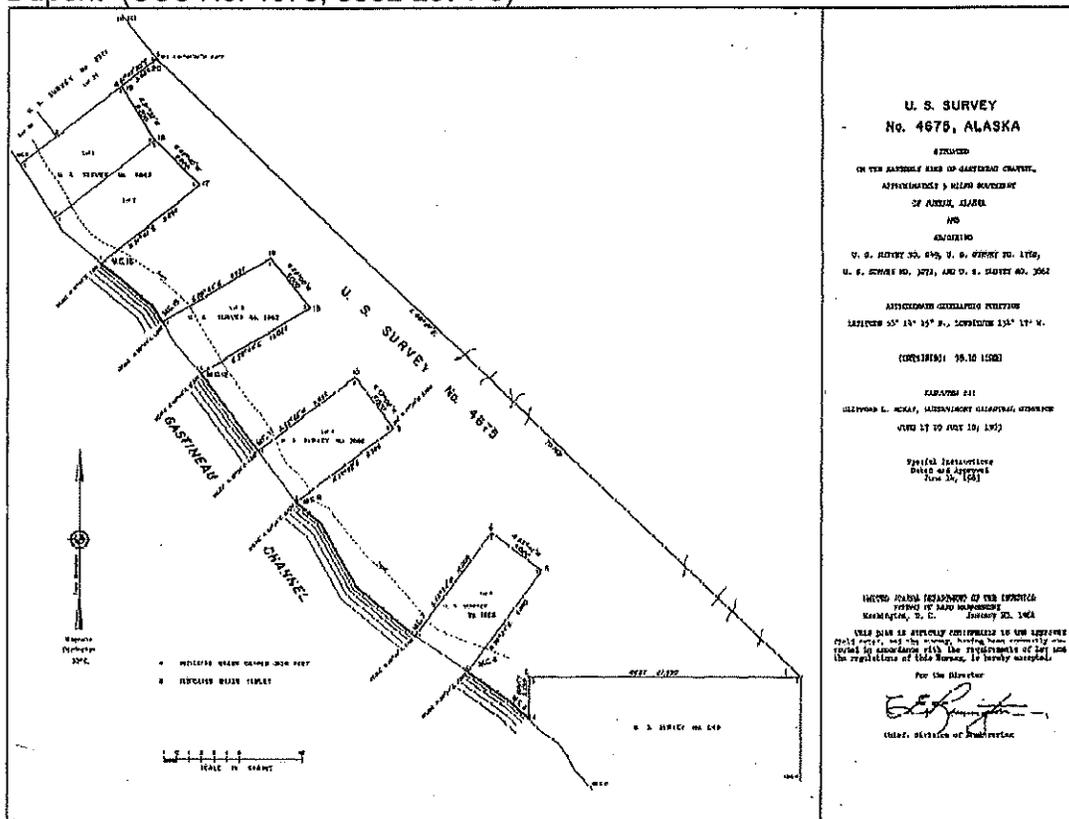
Figure 4.1.5 Dupont Road Extension



The land between the end of Thane Road and the One Nine Company's land is owned by the State of Alaska and is part of the Mental Health Land Trust (see Figure 1.4.6). Indications are that all parties would be open to negotiations regarding the construction of a road. R&M Engineering's rough rule of thumb for the cost of construction of a two-lane gravel road in Juneau is between \$1.3 and \$1.8 million per mile plus administrative overhead of 40%.

Currently, on their busiest days, traffic to the ERA site consists of approximately one bus per half hour plus 10 to 15 employee vehicle roundtrips a day, several trips per day by ERA vans for errands or to pick up passengers, and two trips per week by a fuel truck. Buses leaving the tour ship docks and heading south out of town would cause some diminishment in traffic in downtown, the bridge, and on North Douglas, with a corresponding increase on Thane Road.

Figure 1.4.6 State Mental Health Lands between the end of Thane Road and Dupont (USS No. 4675, 3862 Lot 1-5)



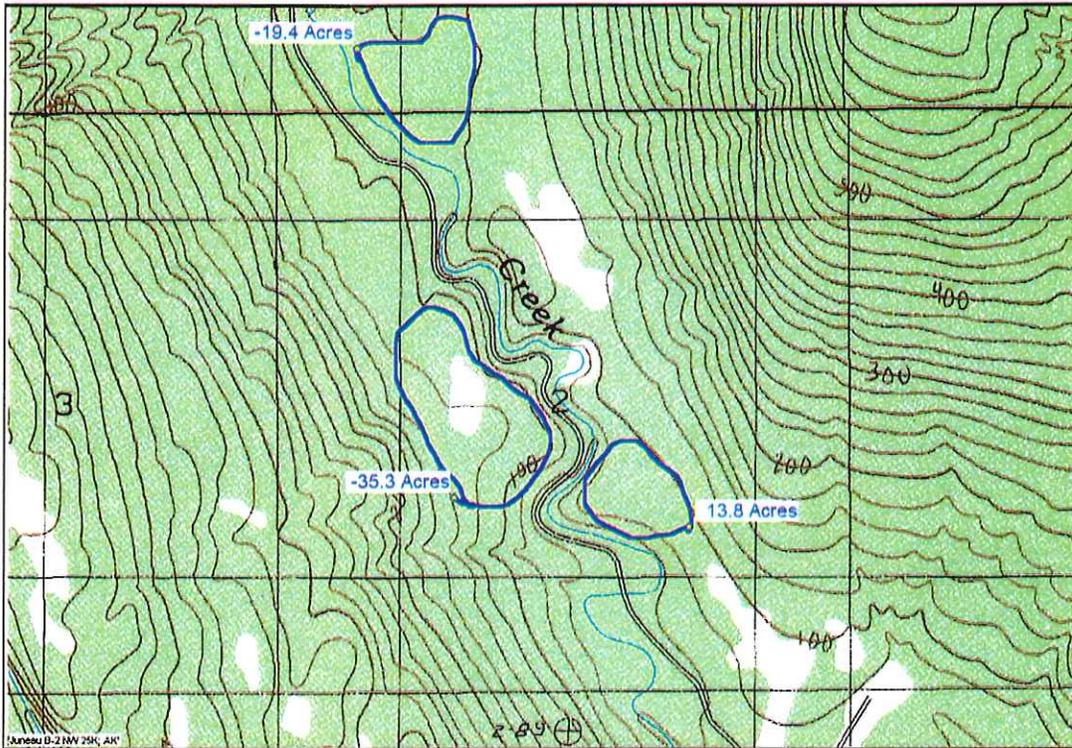
The second way to access the Dupont site is down Gastineau Channel by boat. Subchapter T vessels, which are licensed to carry up to 150 passengers, are manufactured by Allen Marine in Sitka and several other shipyards in the Northwest. Standard buses serving the heliports have capacities of approximately 50 passengers. Allen currently manufactures 50 passenger, 100 passenger, and 150 passenger fast vessels that might be suitable. (See Appendix A for additional information on boats). The operating costs of these craft can be very competitive if they run with close to full loads.

It is probable that Flightseeing operators would strongly prefer a road to the site for construction, fuel trucks, etc., but even with a road, passengers might best be transported by boat. It is probably a safe assumption that no one ever chose a flightseeing tour because of the bus ride, but it seems that a boat ride down the channel with a narrative about the sites (On your right is

the Treadwell Mine cave-in site, where in April of 1917 . . .) could be a selling point for a tour. Boats could also pick up passengers directly from the docks or cruise ships themselves, decreasing Juneau's traffic problems. Transportation time could be equivalent to buses. These vessels are relatively quiet and would not be expected to be a significant new source of noise. The effect of additional wakes in Gastineau Channel would need to be addressed.

An additional feature of the Dupont site is the possibility of also moving the base for floatplane flightseeing there. Such a co-location could offer economic benefits of scale, and could virtually eliminate both helicopter and floatplane flightseeing noise from Thane road, Douglas, West Juneau, and Downtown while improving air safety. This possibility is discussed in greater detail in Appendix C, Floatplane Relocation.

4.1.2 Montana Creek

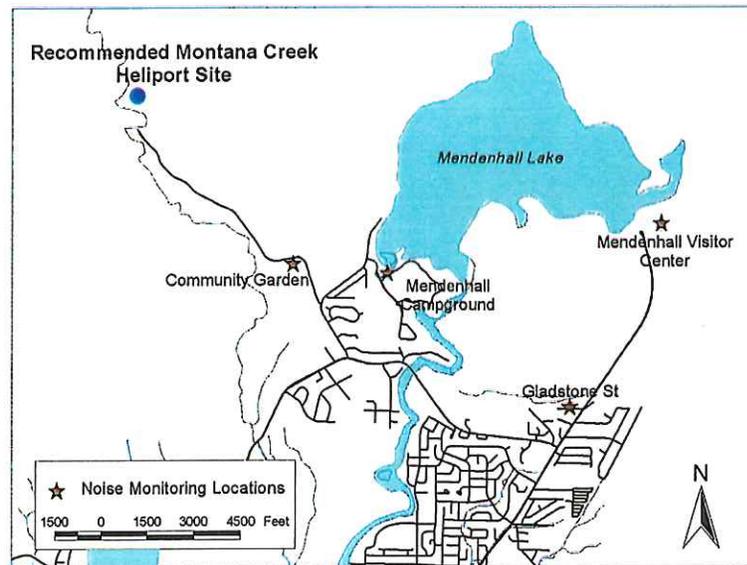


Land Ownership:	State of Alaska A.S.L.S. 98-6 Tract E		
Physical:	Sites ranging from 14 to 35 acres of relatively flat 60' to 120' elevation land exist on either side of Montana Creek to the north of the footbridge.		
Terrain Features:	Montana Creek Drainage is a glacially formed forested valley that opens up into the Mendenhall Valley.		
Adjacent Terrain Features:	Mount McGinnis @ 4228' to the northeast and 2008' mountain to northwest. The Archery range and rifle range lie to the south and the Brigadoon, Brigadoon II, and Montana Creek II subdivisions lie approximately a mile and three quarters to southeast.		
Existing Infrastructure:	Electric Service to Rifle Range.		On site sewer and water required
Access:	15 miles from Marine Park	26 minute drive from Marine Park	Short access road needed
Road Description:	Northwest on Egan Highway, a four-lane freeway, for 9.2 miles. Northeast on Mendenhall Loop Road, a two-lane road, for 2.2 miles. West on Back Loop Road, a two-lane road, for 1.5 miles. North West on Montana Creek Road, a two-lane road for 2.25 miles.		
Type of Traffic:	Commercial and residential traffic.		
Nearest Fire Station:	Glacier Valley Fire Department, 6.9 miles.		

Noise

This is the recommended north site. Currently 2,260 residences are within the 6,000-foot (3,000 feet to either side of the flight line) noise footprint of helicopter flightseeing routes from the Juneau Airport. None of the four flight lines from the Montana Creek site would fly over any residences. (see Figure 4.1.2.2 Montana Creek Flight Routes) The route following the contour of Mount McGinnis and then up the Mendenhall Glacier, however, is likely to be the most heavily used route and, of the four, is the only one where sound will be audible to residences.

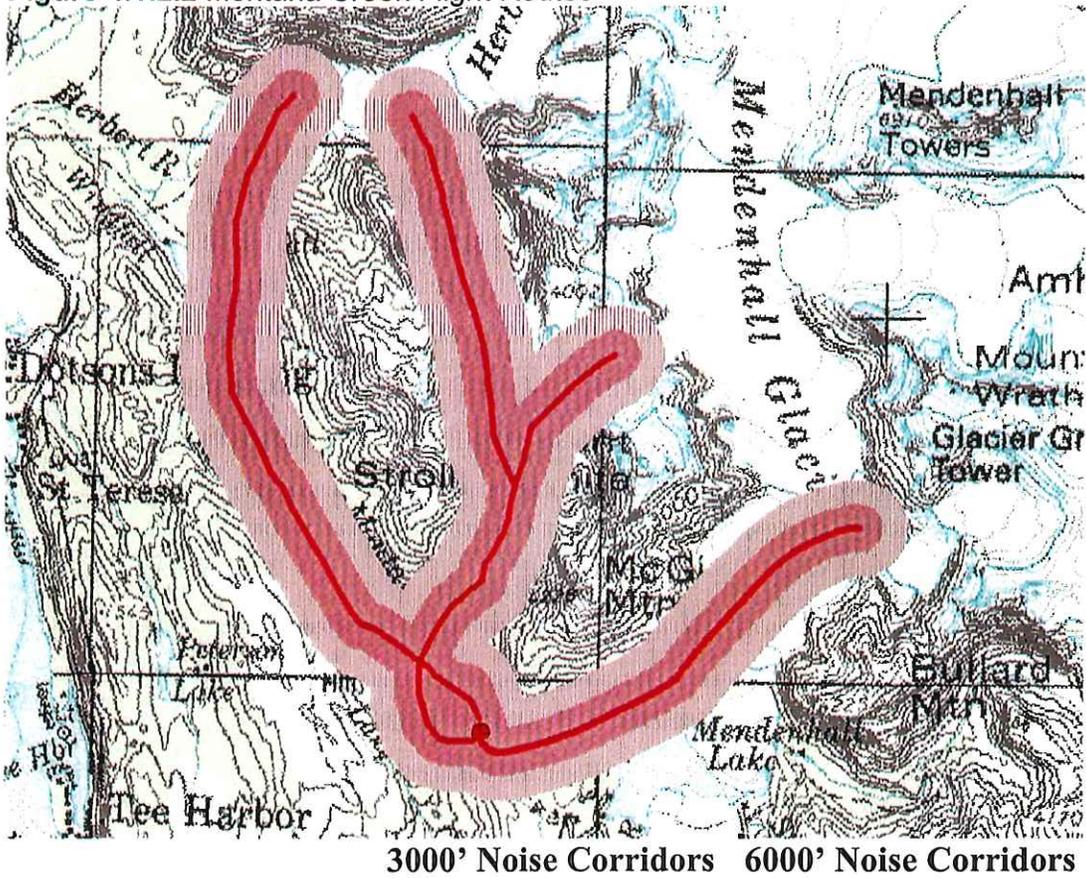
The nearest homes are located on Montana Creek Road itself, or in the northeastern end of the subdivisions near the Mendenhall Campground. These homes are all currently within the noise footprint of flightseeing routes from the Juneau Airport. Maximum sound levels for the proposed route were monitored at 52 to 53 dBA at the Mendenhall Campground, which is slightly closer to the route than the homes in the nearby subdivisions and 56 dBA at the Community Garden, which is the approximately the same distance from the route as the 3 homes on Montana Creek Road. Takeoffs and landings at the Montana Creek site were not audible at the Mendenhall Campground and registered 50 dBA at the Community Gardens.



As a reference, individual cars passing on Montana Creek Road, approximately 100 yards away and the other side of a fringe of trees, averaged approximately 50 dBA at the Community Garden. When the weather or destination allows flight paths to the northwest, helicopter noise would be inaudible at the other measurement locations. Along with the monitoring sites at the Mendenhall Campground and the Community

Garden, monitors were also placed at the west end of Gladstone Street (the last street off Glacier Spur Road before the Glacier), and at the Mendenhall Glacier Visitors Center.

Figure 4.1.2.2 Montana Creek Flight Routes



	3000' Noise Corridors	6000' Noise Corridors
Affected Land Parcels	1	1
Affected Housing Units	0	0

Full results of the noise measurements for the Montana Creek heliport site are presented in Table 4-1-2 below. Figure 4.1.2.3 shows the helicopter flight route flown during noise monitoring.

Table 4-1-2
 Noise Measurement Results (Maximum dBA)
 Montana Creek Heliport Site (N-A is Not Audible)

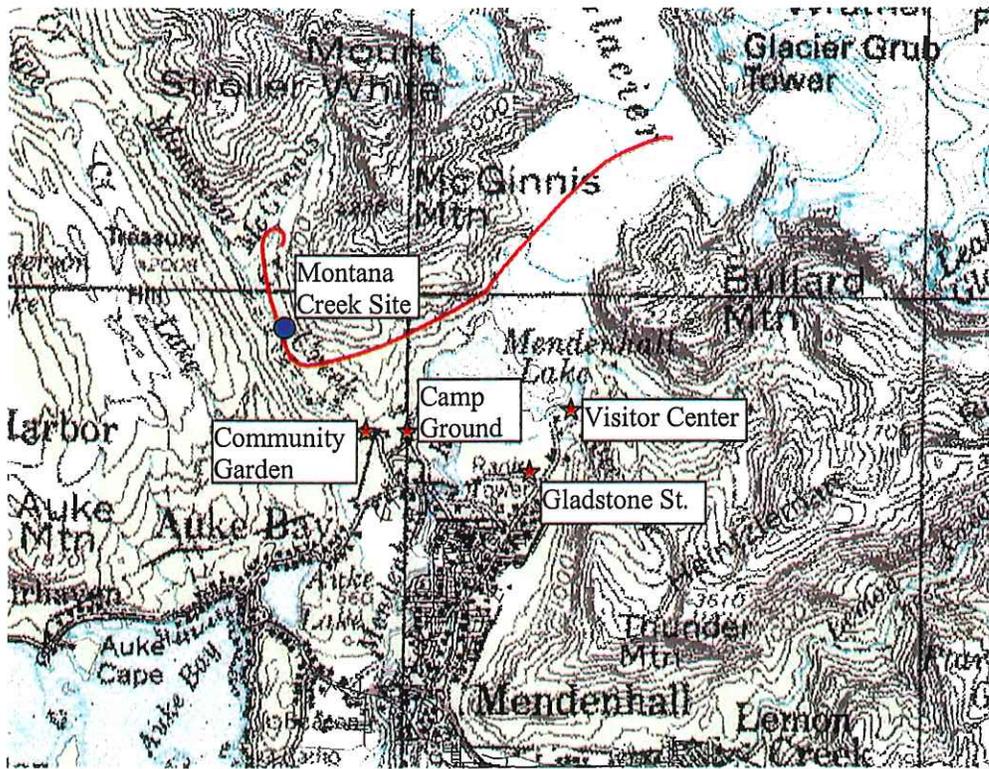
Time	Procedure	Camp Ground	Glad-stone	Visitor Center	Community Garden
		S111	S112	S113	S114
16:55	Approaching Montana Creek from Glacier	52	47	55*	NA
16:58	Landing at Montana Creek	NA	NA	NA	50
16:59	Takeoff from Montana Creek toward Northwest	NA	NA	NA	50
17:00	Enroute from Montana Creek to Upper Glacier	53	38	54*	56

* The higher reading from a greater distance is caused by the sound reflectivity of rock, ice, and water.

In last year's noise study, helicopters flying from the airport up Mendenhall Glacier registered 63 dBA at a temporary monitoring site on Silver Street, approximately three quarters of a mile to the south-southeast. Sound impacts for the houses near the noise footprint of the Mount McGinnis/Mendenhall Glacier route would decrease in intensity, but increase in frequency if a heliport is established at Montana Creek.

The Windfall Lake trail and Herbert Glacier trail already experience flightseeing noise. A Montana Creek heliport would decrease noise impacts along the lower portions of these trails. Noise impacts would remain the same for the upper portions of both trails. The West Glacier trail currently experiences substantial flightseeing noise impacts. Particularly when ceilings are too low to allow helicopters to fly up the McGinnis drainage and over the ridgeline (3,000 feet) north of Mount Stroller White, noise impacts on West Glacier trail would increase with a Montana Creek heliport. In good weather noise impacts to hikers in the McGinnis drainage area would increase.

The map on the next page shows the helicopter flight route flown during noise monitoring. The altitude of the helicopter along the route (after simulated takeoff) was between 400 and 700 feet. Except in minimum conditions, helicopters should be able to fly a higher contour around McGinnis that would further reduce noise impacts. There should be no reason to ever fly a lower route on any day the ceiling is high enough to fly tours.



Air Safety

Being at a relatively low elevation, the Montana Creek site would remain below most of the low scattered or broken ceilings that tend to make up the inclement weather in the area. With the adjacent terrain protecting the site from the northeast and northwest, winds would be a relatively small factor at the Montana Creek valley site.

Approaches and departures would be outside of the existing Class D/E airspace at the Juneau Airport. Typical flight paths for the flightseeing tours would remain to the north of the airport, and would produce no airspace conflicts with Juneau airspace or IFR approach/departure procedures. The Montana Creek site would be able to meet the requirements set forth in FAA AC 150/5390-2A Heliport Design given that:

1. the site has sufficient area for the functional elements of an alternative heliport;
2. the site has a relatively gradual grade for site preparation; and
3. there are sufficient areas for approach, departure and protection zones.

Physical Description

Montana Creek Drainage is a glacially formed forested valley that opens up into the Mendenhall Valley. The drainage is bounded by Mount McGinnis (4228') to the northeast and an unnamed 2008' mountain to northwest. The general area considered has several relatively level sites from 14 to 35 acres and ranging from elevation 60 to 120 feet MSL. The grade slopes up on both sides of the creek to about elevation 1000 feet MSL.

The Montana Creek sites are located approximately 5.3 miles northwest of the Juneau Airport west of Mendenhall Lake. The archery range, rifle range, and shotgun range are south of the site along Montana Creek Road. It appears that flight paths from the heliport could be arranged so there is no conflict with the rifle range. There are three houses between the rifle range and shotgun range and the Brigadoon, Brigadoon II, and Montana Creek II subdivisions lie approximately a mile and three quarters to southeast. The site that seems most promising is just past the end of Montana Creek Road over the footbridge across Montana Creek.

In its draft EIS on helicopter landings, the Forest Service has identified a variety of sensitive wildlife habitats (see Figure 4.1.2.4). The Montana Creek Site does not infringe on any of the identified wildlife sensitive areas and its flight routes allow for the observance of mandated buffer distances. There are a number of muskeg wetlands in the Montana Creek area, but it appears the heliport could be sited to minimize or totally avoid them. There do not appear to be any environmental issues that would be a bar to heliport development

Infrastructure

Electricity would need to be extended from the rifle range along Montana Creek Road to the site. On site sewer and water would be required.

Ownership

The City and Borough of Juneau recently acquired the land (A.S.L.S. 98-6 Tract A) along the Montana Creek road from the state. The state owns the land (A.S.L.S. 98-6 Tract E) starting just north of the footbridge and all three sites are on this land. CBJ could acquire title to this land from the state. (see Figure 4.1.2.5) There is a 50-foot public access and fish and wildlife habitat easement along Montana Creek, but there is no need to infringe on the easement.

Figure 4.1.2.4 Sensitive Wildlife Habitat Source: USFS 2002-2006 Icefield Landing Draft EIS

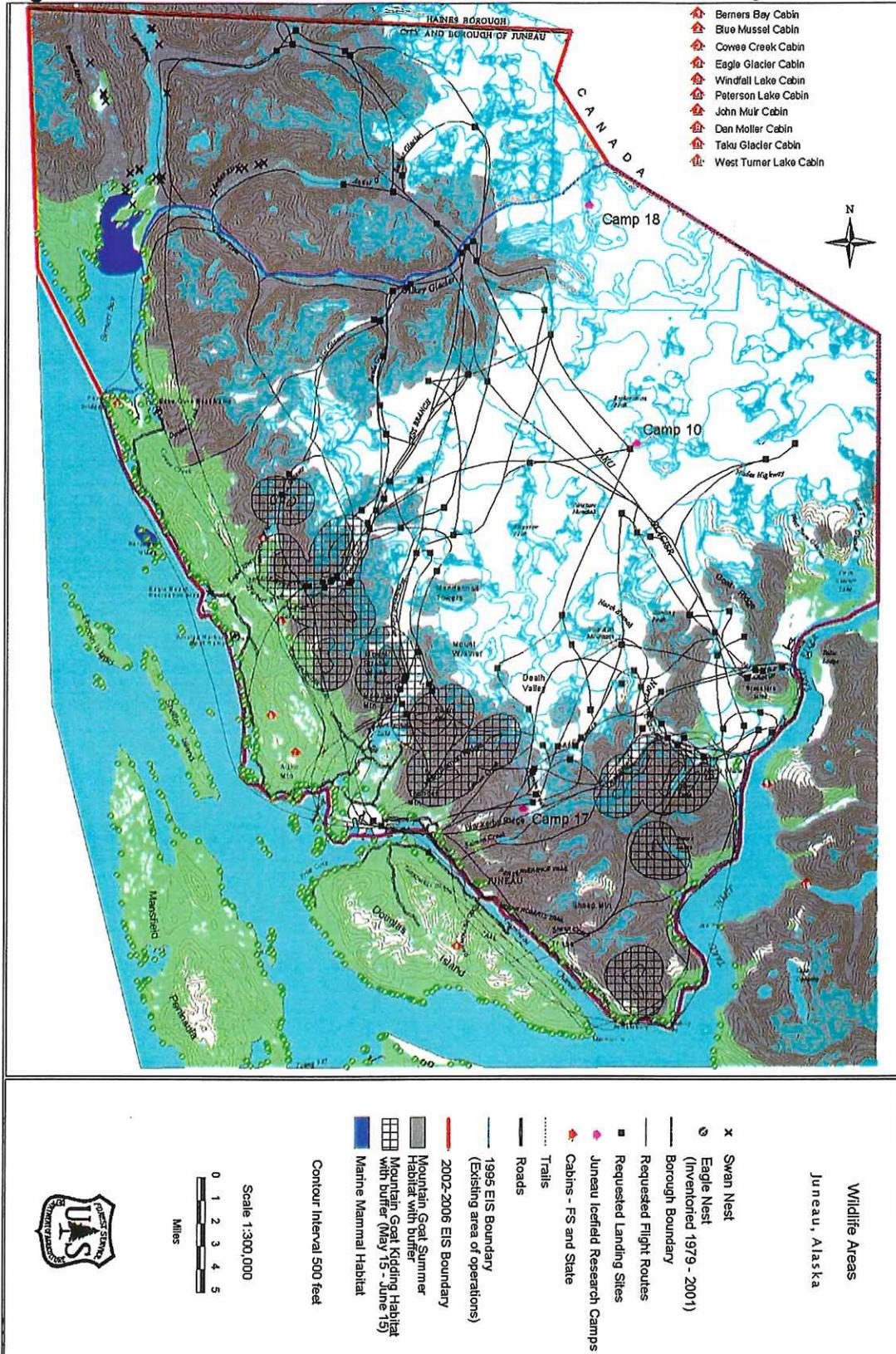
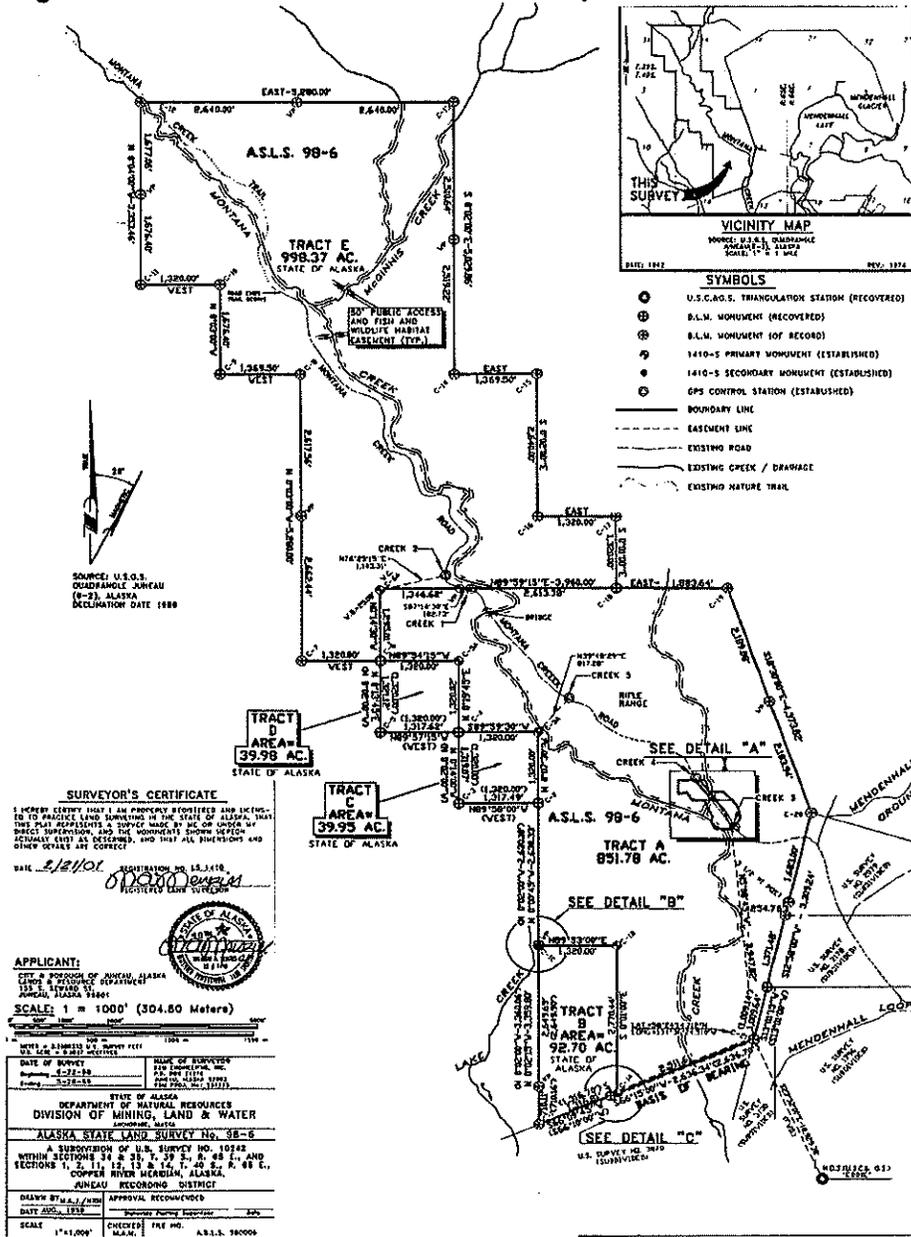


Figure 4.1.2.5 Montana Creek Land Survey



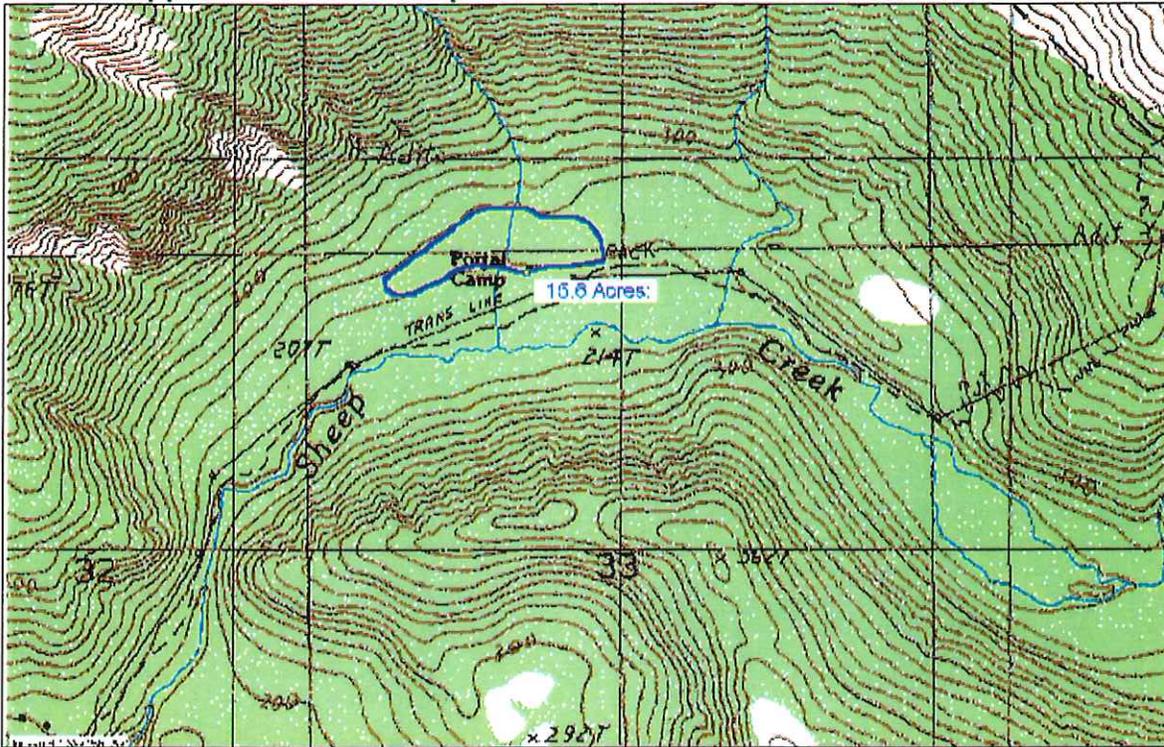
Access

Montana Creek Road runs almost to the site. The road is paved to the Rifle Range, 1/2 mile from the end. At the point where Montana Creek Road crosses Montana Creek, the vehicle bridge has been removed and replaced with a pedestrian bridge. Beyond this point the road has not been maintained since the bridge removal. Replacing the bridge and upgrading

the road would be straightforward and relatively inexpensive, however. The site is 15 miles from Marine Park or a 26-minute bus ride. From downtown, traffic bound to the site would travel northwest on Egan Highway, a four-lane freeway, for 9.2 miles, northeast on Mendenhall Loop Road, a two-lane road, for 2.2 miles, west on Back Loop Road, a two-lane road, for 1.5 miles, and northwest on Montana Creek Road, a two-lane road for 2.25 miles. There would not be any substantial residential neighborhood impacts.

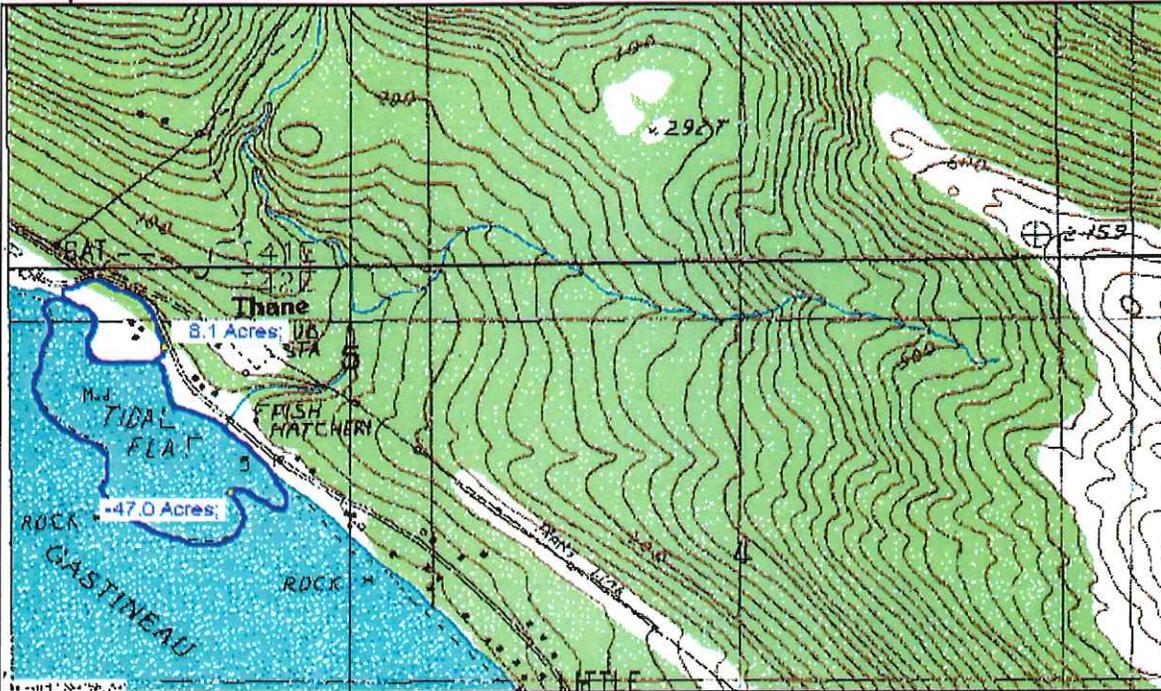
4.2 Alternate Level 4 Sites

4.2.1 Upper and Lower Sheep Creek Combined Sites



Land Ownership:	AEL&P		
Physical:	12 to 20 acre site	700' to 800' elevation	
Terrain Features:	Mine portal is on the valley floor of Sheep Creek Valley. A one-acre gravel pad is adjacent to Mine Portal and structures.		
Adjacent Terrain Features:	Sheep Creek Valley is a glacially formed hanging valley surrounded by mountain peaks ranging from 1826' to 4238'. A narrow gorge forms the mouth of the valley at 700'. The Annex Creek power line runs through Sheep Creek Valley.		
Existing Infrastructure:	Electricity	Well water	Mine warehouse & outbuildings
Access:	5.8 miles from Marine Park		34 minute drive from Marine Park
Road Description:	Thane road, a two lane-winding road without a paved shoulder, for 3.2 miles. The Mine Portal road is a narrow single lane gravel road with a steep grade and two switchbacks as it climbs up to Sheep Creek Valley.		
Type of Traffic:	Commercial traffic extends to the Sheep Creek Mine cut off. Residential traffic extends to end of road. A commercial tour operator is currently running tours utilizing the first mile of the Sheep Creek Road.		
Nearest Fire Station:	Downtown Juneau Fire Station, 6.3 miles.		

Sheep Creek Delta

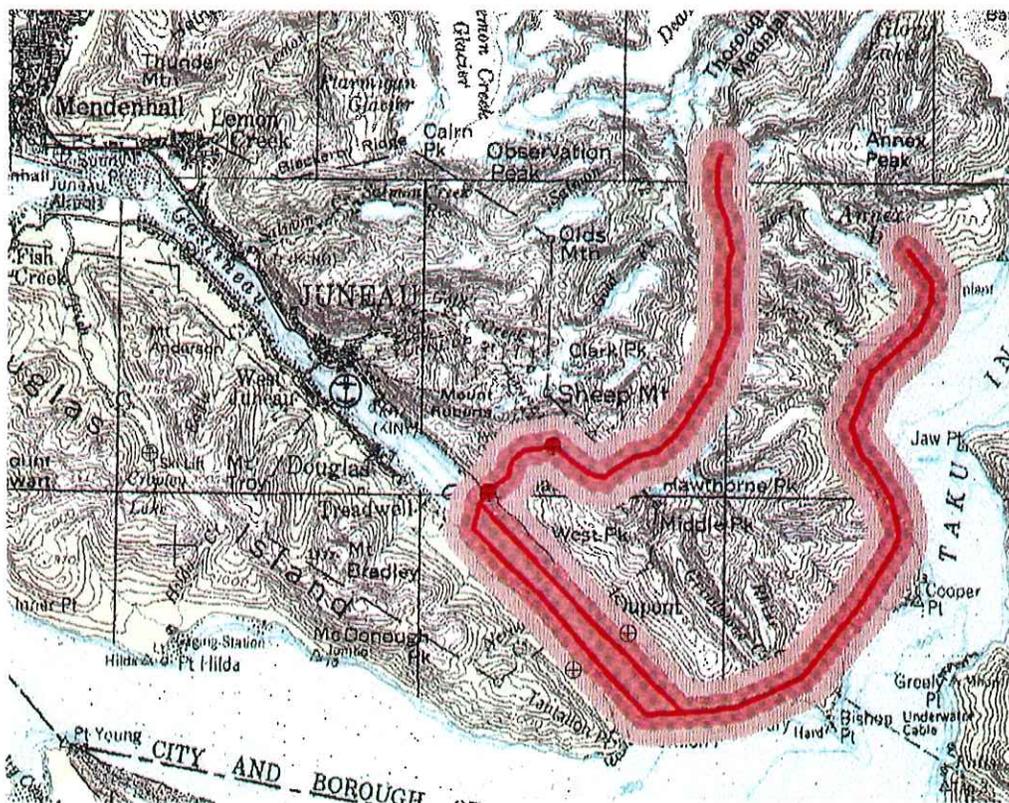


Land Ownership:	AEL&P
Physical:	8.1 acres upland, 47 acres 0' to 50' elevation inter tidal
Terrain Features:	Beach front and inter tidal area. Mud flats along the south and southwest borders extend over a 47-acre area and are exposed at low tide.
Adjacent Terrain Features:	The Thane Ore House, Sheep Creek Fish Hatchery and residential areas border this area.
Existing Infrastructure:	Electricity City water and sewer to Big Rock Dump.
Access:	3.8 miles from Marine Park 9 minute drive from Marine Park
Road Description:	Thane road, a two-lane winding road without a paved shoulder.
Type of Traffic:	Commercial traffic extends to the Sheep Creek Mine cut off. Residential traffic extends to end of road.
Nearest Fire Station:	Downtown Juneau Fire Station, 4.3 miles.

Noise

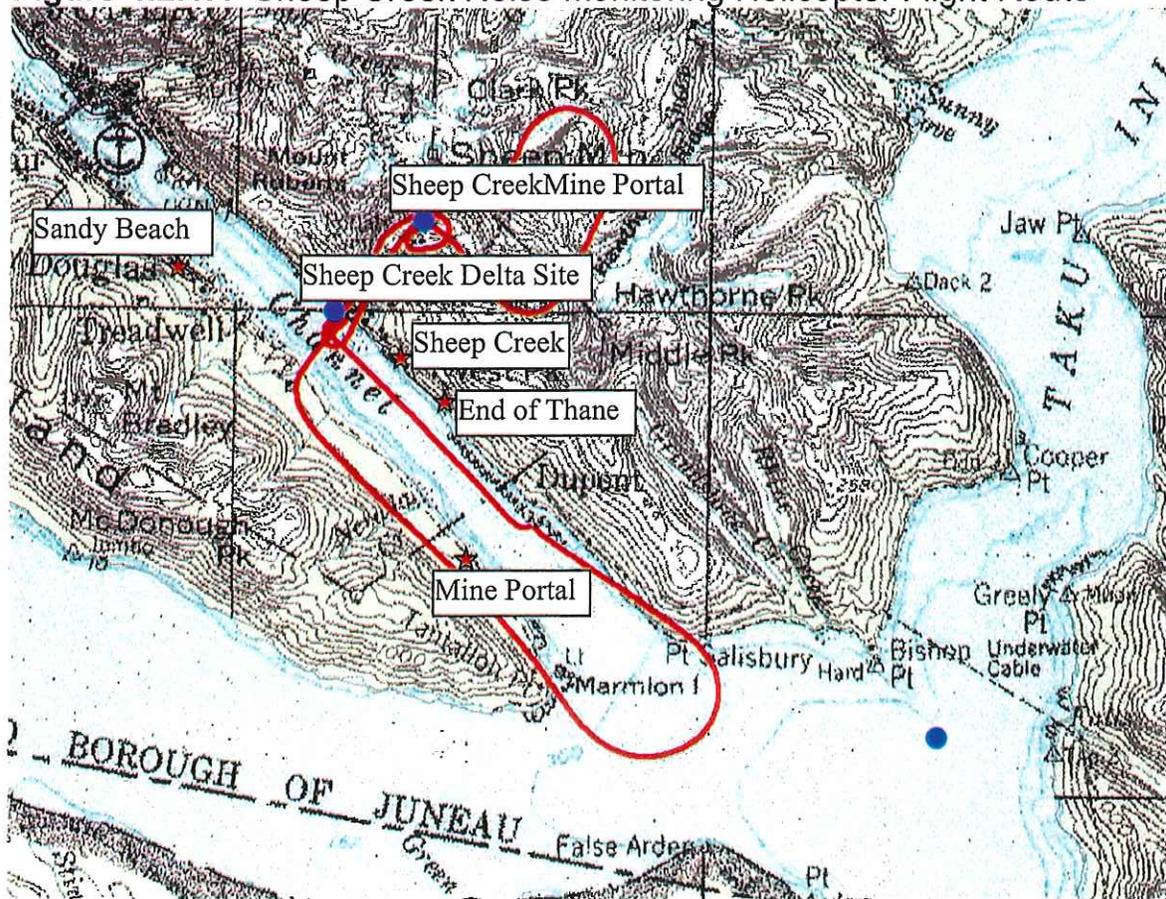
The Sheep Creek site is presented as a combination of two sites. The upper site offers excellent noise reduction benefits, but may only be used on those days when the ceiling is above 3,000 feet to allow helicopters to pass through Powerline Gulch to the northeast of the site. Sound monitoring showed that helicopter takeoffs, landings, and flights through Powerline Gulch are not audible at the Sheep Creek pull-off on Thane Road, the end of Thane Road, Lucky Me, or at Sandy Beach.

**Figure 4.2.1.3
Sheep Creek Mine Portal and Sheep Creek Delta
Flight Routes and Noise Contours**



	3000' Noise Corridors	6000' Noise Corridors
Affected Land Parcels	89	164
Affected Housing Units	49	85

Figure 4.2.1.4 Sheep Creek Noise Monitoring Helicopter Flight Route



**Table 4-2-1 Noise Measurement Results (Maximum dBA)
Sheep Creek Heliport Site**

Time	Procedure	Sandy Beach	Sheep Creek	End of Thane	Lucky Me
		S101	S102	S103	S104
12:46	Existing Procedure (Noise Abatement Down Channel Procedure and up Sheep Creek)	63	58	45	48
12:52	Depart Mine Portal to Glacier	NA	NA	NA	NA
12:55	Fly from Mine Portal to Lower Sheep Creek	50	66	NA	48
12:56	Hover and Land at Lower Sheep Creek	50	58	NA	45
12:58	Depart from Lower Sheep Creek down channel	54	56	45	49
13:00	Flying Down Channel on Douglas Side Using Noise Abatement Path	52	52	51	63

Weather records from the NOAA weather station indicate the ceiling has been above 3,000 feet at the airport about three quarters of the time for the past two summers. Ceiling conditions along ridgelines are often lower and operators have estimated the ridgelines may be crossed roughly 50 % of the time. Despite the excellent noise reduction benefits of the Sheep Creek Portal Site, as well as the existence of a road and other infrastructure, a site that eliminates 25 to 50% of an operator's flights is not feasible from an economic or safety standpoint.

The lower Sheep Creek site is small and would present increased noise for some Thane residents who live close to Sheep Creek. The way the operation of the combined sites is envisioned is that on days when the ceiling is high enough, helicopters would fly up to the upper portal site and operate from there for the remainder of the day, flying through Powerline Gulch to access the Icefield. The helicopters would return to the lower site after the last flight of the day. On days when the ceiling was too low for use of the upper site, helicopters would fly out of the lower site throughout the day and use the same route down Gastineau Channel currently being used on low weather days.

Takeoff and landings at lower Sheep Creek measured 56-58 dBA at the Sheep Creek pull-off. These levels are higher than the current levels because the helicopters are operating at a lower elevation. For all other measurement locations the noise levels are the same or lower. These activities were not audible at the end of Thane and measured 50dBA at Sandy Beach and 45-49 dBA at Luck Me. Please see Table 4.2.1 for full details. At the Sandy Beach monitoring site, the noise from operations at the lower Sheep Creek heliport site is lower than occurs during the existing flyovers. However, the activities on the helipad are audible and represent a change in the character of the noise.

The combination of the two sites could be developed in a manner that would offer substantial noise reductions to most residents of Juneau, including most Thane residents. The current ERA flight paths encompass 3,777 residences in their noise footprint. The Sheep Creek noise footprint would cover 85 homes and (Figure 4.2.1.3) most of these would only be exposed to helicopter noise on days with low ceilings. However, the split operation and redundant facilities would be more expensive for the initial development as well as the operation. The noise reduction benefits are not as great as the Dupont site.

Air Safety

The flight entrance to the upper site is formed by a narrow gorge about 500 feet above the portal site. Careful design would be required for the approach surface to clear this gorge and the access road to the site. Only one approach/departure path would be available on the upper site, although more than one TLOF could be developed. This may require the full-time use of the lower site for passenger operations.

With the approach and departure path routed through the gorge at elevation 1,300 feet MSL, the site would be significantly affected by the low scattered or broken ceilings that tend to make up the inclement weather in the area. Therefore, this site would not be a reliable location for the flightseeing operations, and would need to be supplemented with the lower site. With the adjacent terrain protecting the site from all sides, winds would be a relatively small factor at the Sheep Creek upper site.

Since the lower site is located along the Gastineau Channel, the airspace is relatively clear along the channel side (northwest and southeast), as well as for approximately one mile across the channel to the southwest, except for maritime traffic. The normal large ship route down the middle of the channel is approximately 2,500 feet from the east bank at that location; the 8:1 approach surface would clear about 300+ feet over the ship route, which would clear the channel for cruise and cargo ships. The FAR 77 heliport approach surfaces would be placed in south-southeasterly and west-northwesterly directions, angling into the channel to avoid ship traffic.

Being at a relatively low elevation, the site would remain below most of the low scattered or broken ceilings that tend to make up the inclement weather in the area. With the ridgeline behind the site, the stronger northeast winds would be relatively small factor for the lower site.

Both sites are approximately 11 miles from the Juneau Airport along the final approach course to Runway 26 (or departure course from Runway 8). At that location, approaching airline jet aircraft would be at approximately 3,800 feet MSL; departing flights would be higher. Therefore, there would be no airspace conflicts with Juneau airspace or IFR approach/departure procedures.

The Sheep Creek combined site would be able to meet the requirements in FAA AC

150/5390-2A Heliport Design given that:

1. the sites have sufficient area for the functional elements of an alternative heliport;
2. the sites have a relatively gradual grade for site preparation; and
3. there are sufficient areas for approach, departure and protection zones.

Physical Description

The Sheep Creek combined sites are located approximately 4 miles southeast of downtown Juneau on the northeast side of the Gastineau Channel at the Sheep Creek delta and at the mine portal camp area.

Upper Site: The Sheep Creek mine portal site is located about 1.5 miles from the Gastineau Channel up Sheep Creek. The general site is composed of a relatively level site of about 16 acres and ranging in elevation from 700 to 800 feet MSL. This would be marginally sized for the heliport site. The grade rises steeply on three sides of the site.

Lower Site: The lower delta site is gradually sloping and linear along the edge of the channel at an elevation of 0-50 feet MSL, with 2:1 slopes to the northeast toward a ridgeline at 2,000 to 3,800 feet MSL. The lower site is open to water toward the southeast. Since the site has only about 8 total acres available, it would be adequate for only limited facilities, such as the FATO's, terminal buildings, limited bus parking, and helicopter parking positions. Hangars, fuel farm, and bus staging would have to be placed in the upper site.

Infrastructure

Electricity is available at both sites. City water and sewer extend down Thane Road to the Big Rock Dump. Both upper and lower sites have existing wells and septic systems though these would probably need to be upgraded. At the upper site there are a number of existing mine buildings, some of which could probably be adapted for heliport use.

Ownership

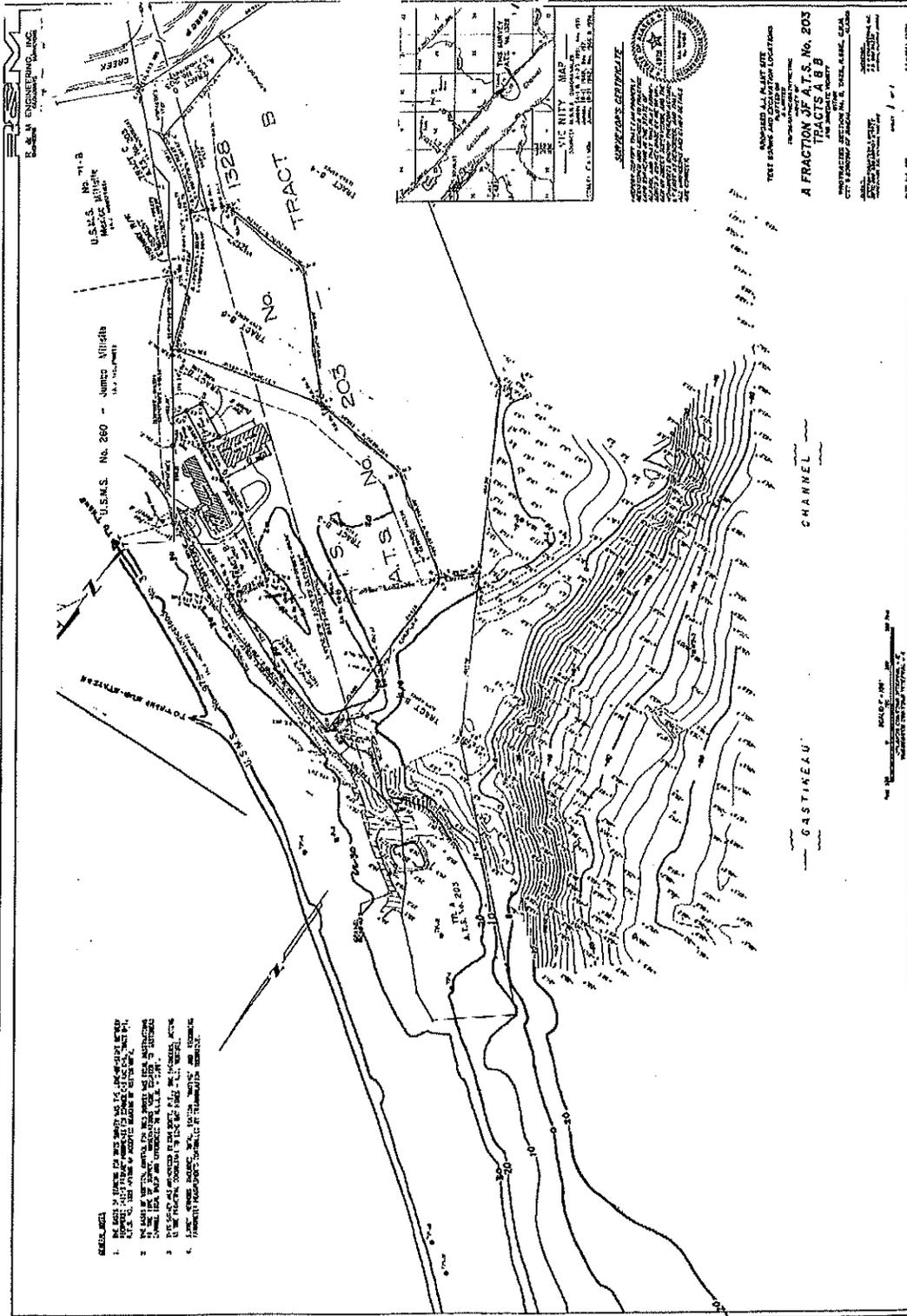
Alaska Electric Light and Power owns both the upper and lower Sheep Creek sites. Representatives of the company have advised they are open to discussing lease or sale of the property with the city and borough. (Figure 4.2.1.4)

Access

These sites lie approximately 3.2 miles down Thane road. Thane Road is a narrow

two-lane winding road without a paved road. Residences begin on Thane Road just past Sheep Creek. The Mine Portal road is a narrow single lane gravel road with a steep grade and two switchbacks as it climbs up to Sheep Creek Valley. It would require some upgrading, but can be used by buses. Commercial traffic extends to the Sheep Creek Mine cut off. A commercial tour operator is currently running tours utilizing the first mile of the Sheep Creek Road. Residential traffic extends to end of road.

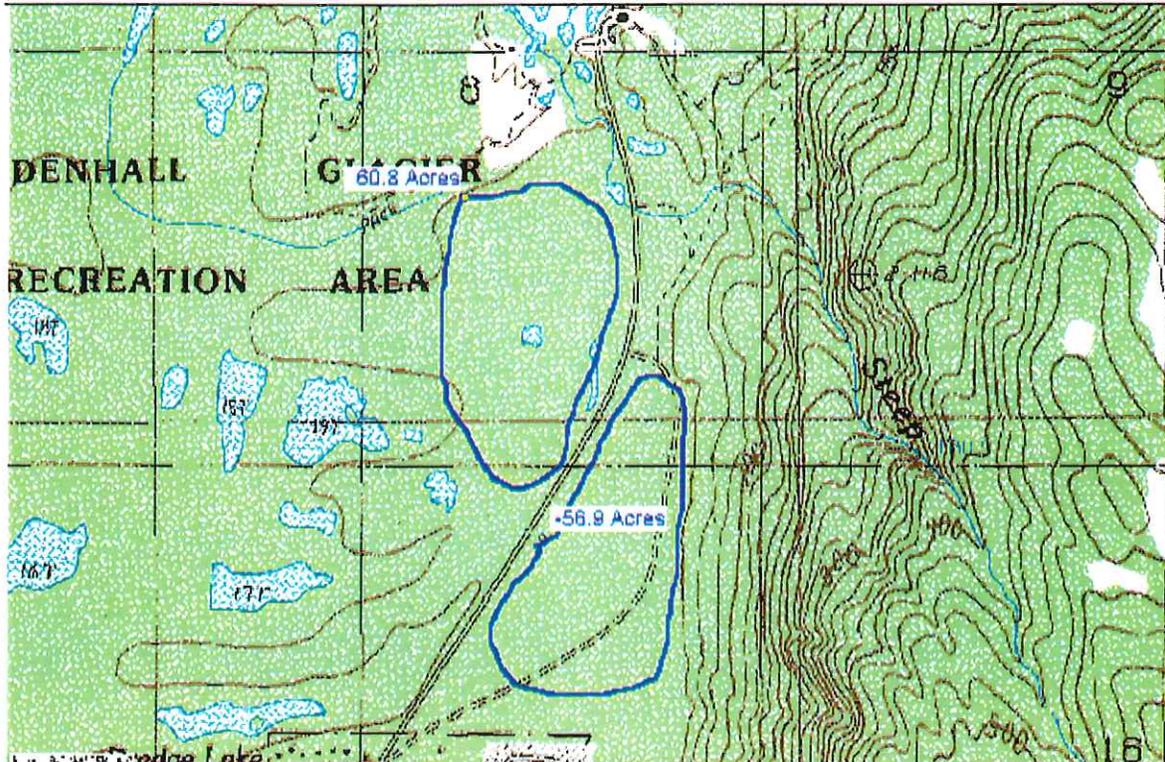
Figure 4.2.1.5 Sheep Creek Delta Land Survey - (Lower Site)



Michael Baker Jr., Inc.
 FINAL REPORT
 September 24, 2001

Alternative Heliport Assessment
 for the
 City and Borough of Juneau

4.2.2 Mendenhall Glacier



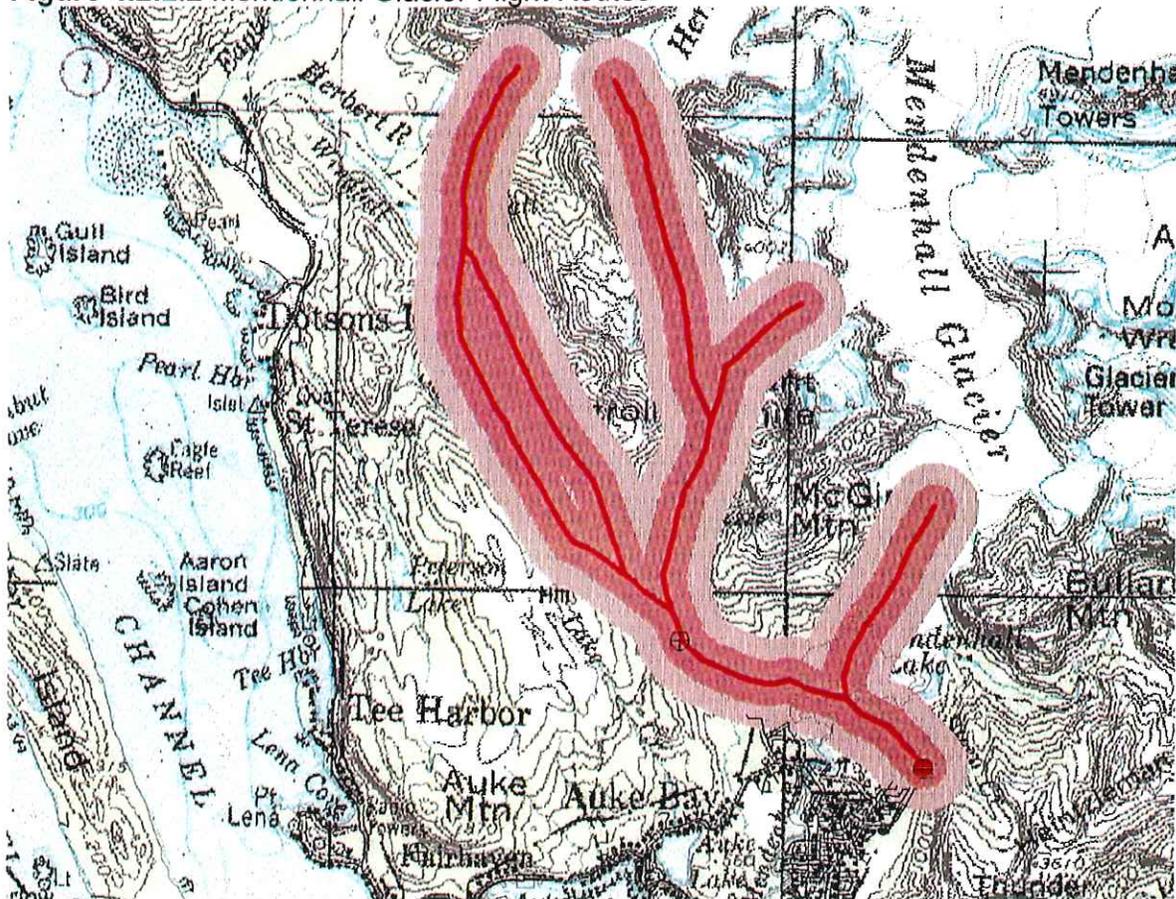
Land Ownership:	National Forest Lands	
Physical:	12 to 20 acres	40' elevation
Terrain Features:	Forested flat area with a variety of streams and ponds in the area.	
Adjacent Terrain Features:	Recreation trails and salmon spawning streams are in this area. Mendenhall Glacier Visitor Center and Lake is .5 miles to north. Residential areas are .5 miles to the south.	
Existing Infrastructure:	Electricity	City Water and Sewer
Access:	12.6 miles from Marine Park	19 minutes drive time from Marine Park
Road Description:	Northwest on Egan Highway, a four-lane freeway, for 9.2 miles. Northeast on Mendenhall Loop Road, a two-lane road, for 3.4 miles.	
Type of Traffic:	Commercial and residential traffic.	
Nearest Fire Station:	Glacier Valley Fire Department, 4.5 miles.	

Noise

In the mid to late 1960's, ERA Helicopters operated from a base at the Mendenhall Glacier. This past year, there have been a number of suggestions that this be the site for a new heliport. Operators also expressed interest in the site, though with

reservations about noise impacts. Because of the interest expressed by varied parties, we believed the Mendenhall Glacier area deserved a serious evaluation.

Figure 4.2.2.2 Mendenhall Glacier Flight Routes



	3000' Noise Corridors	6000' Noise Corridors
Affected Land Parcels	2	139
Affected Housing Units	0	125

As mentioned in the summary of this study, to be a success, an alternate heliport must offer dramatic reductions in flightseeing noise, without inflicting new noise levels on a substantial number of people. While this site would offer a reduction in the number of residences within the helicopter noise footprint, it would shift much of those impacts to a new group of homes.

The results of the noise measurements for the Glacier Heliport site are presented in table on the following page. Figure 4.2.2.3 shows the helicopter flight route flown

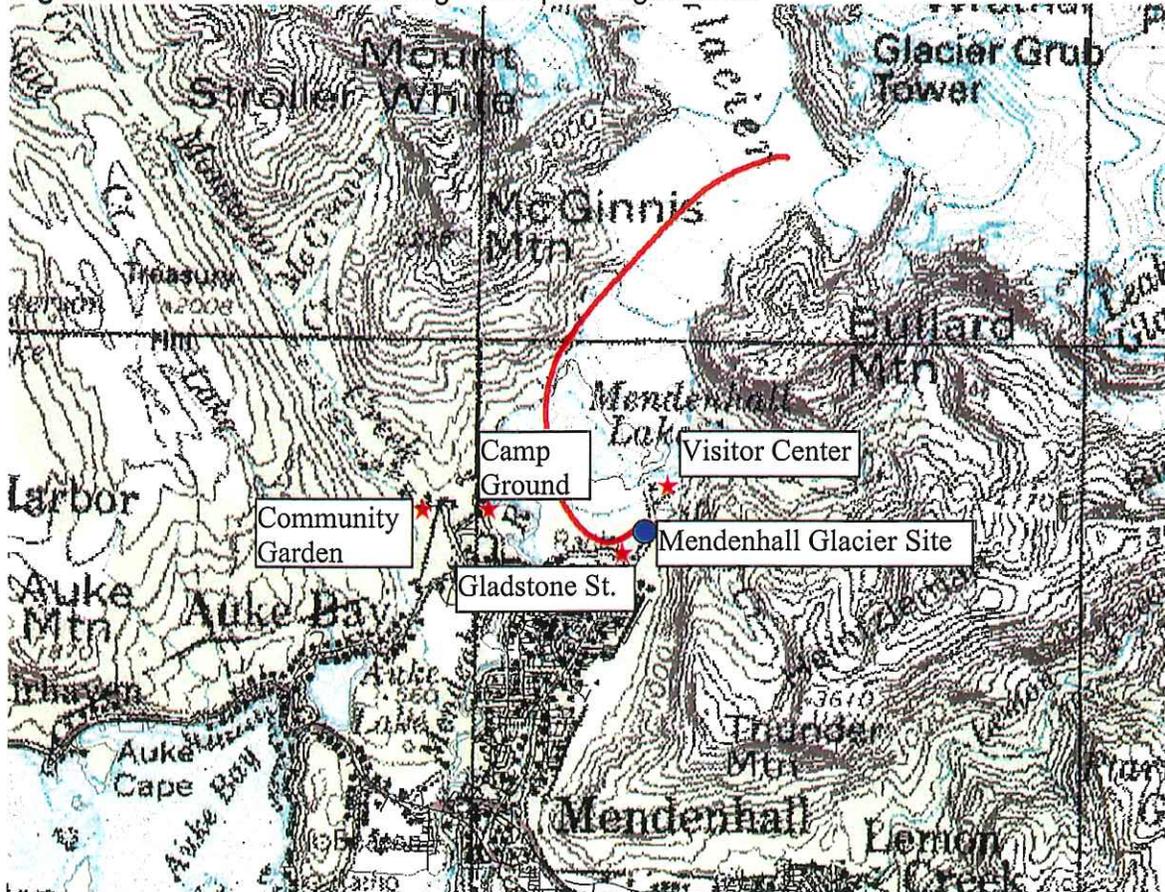
during noise monitoring. The results show that the highest noise levels occur near the Mendenhall Camp Ground measurement site. These levels are higher than what typically occur with current flight paths, or would occur with a Montana Creek heliport. The subdivisions of Brigadoon, Brigadoon II, and Montana Creek II, close to the Skaters Cabin campground would be noticeably impacted. Gladstone Street is the last street off Glacier Spur Road before it crosses into National Forest Land. The noise impacts were not as pronounced as expected at the Gladstone monitoring site, but the noise in the Glacier Park and Glacier Valley subdivisions (bordering the Dredge Lake area) and the Pleasant Gardens Subdivision (east of the spur road, accessed by Gladstone, Garnet, and Threadneedle Streets) would be a new and very noticeable impact.

This study has centered on residential impacts, but it should also be pointed out that a Mendenhall Glacier heliport would increase the noise impacts at the Mendenhall Glacier Visitor's Center and diminish the viewing experience. This might make the Forest Service more reluctant to enter into a land trade to make this possible. Noise on the West Glacier trail would be about the same under this alternative as the Montana Creek heliport, but noise on the East Glacier trail would be greater.

Noise Measurement Results (Maximum dBA)
Mendenhall Glacier Heliport Site (N-A is Not Audible)

Time	Procedure	Camp Ground	Glad Stone St	Visitor Center	Montana Creek
		S111	S112	S113	S114
17:07	Approaching Glacier Heliport Site from South	56	52	54	N-A
17:08	Landing at Glacier Heliport Site	41	52	51	N-A
17:11	Takeoff from Glacier Heliport Site	52	54	51	N-A
17:12	Departing to North Toward Montana Creek	66	51	51	N-A

Figure 4.2.2.3 Noise Monitoring Helicopter Flight Route



Air Safety

Being at a relatively low elevation, the site would remain below most of the low scattered or broken ceilings that tend to make up the inclement weather in the area. With the adjacent terrain protecting the site from the east and west, the stronger northeasterly winds coming down the Mendenhall Glacier would be a moderate factor at the site during the few days per season with strong winds. However, approaches would typically be made into the wind.

Approaches and departures would be just outside of the existing Class D/E airspace at the Juneau Airport. Typical flight paths for the flightseeing tours would remain to the north of the airport, and would produce no airspace conflicts with Juneau airspace or IFR approach/departure procedures.

The Mendenhall Glacier Visitor Center site would be able to meet the requirements set forth in FAA AC 150/5390-2A Heliport Design given that:

1. the site has sufficient area for the functional elements of an alternative heliport;
2. the site has a relatively gradual grade for site preparation; and
3. there are sufficient areas for approach, departure and protection zones.

Physical Description

The Mendenhall Glacier Visitor Center site is located approximately 3.7 miles north-northeast of the Juneau Airport, immediately southeast of Mendenhall Lake. The general site is composed of two relatively level sites of 12 to 20 acres at about elevation 40 feet MSL formed by the retreat of the Mendenhall Glacier. The grade is level for about two miles to the west across the lake, and slopes up toward the Heintzleman Ridge at about elevation 2,500 feet MSL toward the east. There are a variety of streams and ponds in the area as well as recreation trails and salmon spawning streams. The Mendenhall Glacier Visitor Center is one half mile to north. Residential areas are one half mile to the south.

Infrastructure

Electricity and city water and sewer are relatively accessible to the site.

Ownership

This site is owned by the U.S. Forest Service. While the District Ranger has shown a great willingness to work with the CBJ to improve the flightseeing noise issue, the District Ranger has expressed reservations about a heliport in this area. This option

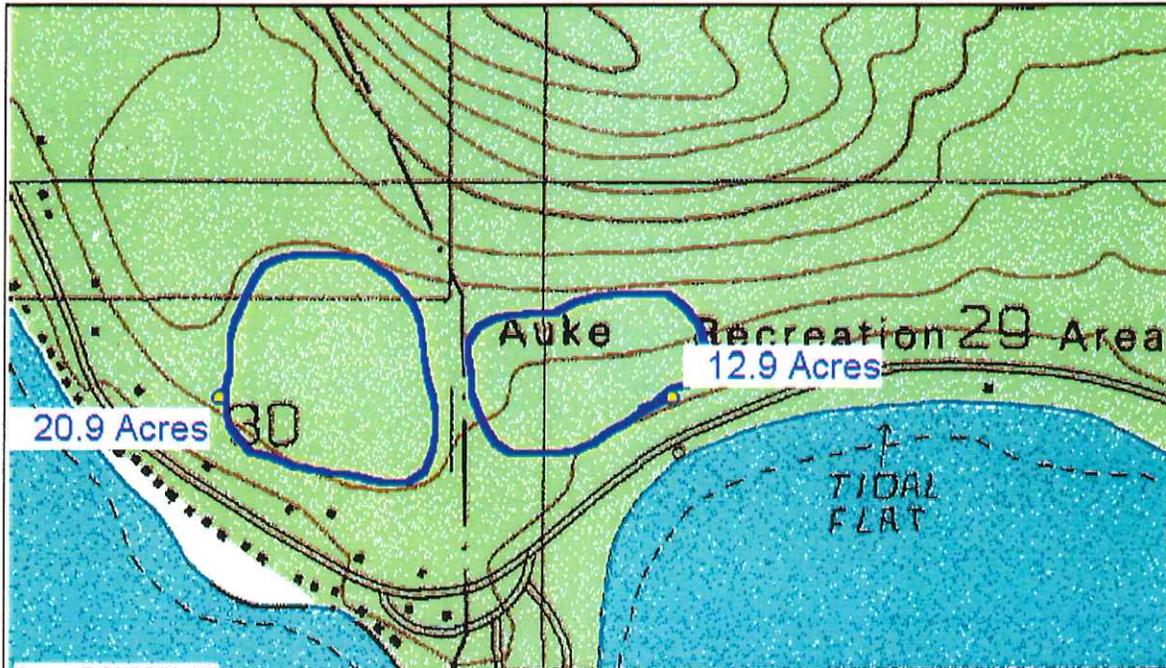
has been in the news several times and the Forest Service has received many calls opposing a heliport at this site. A heliport at this site would require a land trade or lease from the Forest Service.

Access

This site would be very accessible directly off the Glacier Spur Road.

4.3 Level 3 Sites

4.3.1 Auke Recreational Area Cutoff Road



Land Ownership:	City owned uplands on the 20.9 acre site. National Forest uplands on the 12.9 acre site.	
Physical:	Two 12 to 20 acre site 20' to 60' elevation	
Terrain Features:	Gradually sloping timbered upland area.	
Adjacent Terrain Features:	Stephens Passage to the south, 1780' Auke Mountain to the northeast. Auke Recreational Area borders to the south and southeast. Residential area borders to the south, west and east.	
Existing Infrastructure:	Electricity	City Water
Access:	14.5 miles from Marine Park	21:30 minute drive from Marine Park
Road Description:	Northwest on Egan Highway, a four-lane freeway, for 9.5 miles. Egan turns into Glacier Highway, a two-lane road that continues northwesterly 5 miles to the Auke Recreational Cut Off.	
Type of Traffic:	Commercial and residential traffic.	
Nearest Fire Station:	Auke Bay Fire Department, 3 miles.	

The Auke Recreational Area Cut-Off Road site is located approximately 5.5 miles

west of the Juneau Airport at Indian Cove. There are two areas within the relatively level 34 total acres general site that were considered. The elevation ranges from 20 to 60 feet MSL. The grade slopes to the north toward Auke Mountain at about elevation 1,870 feet MSL.

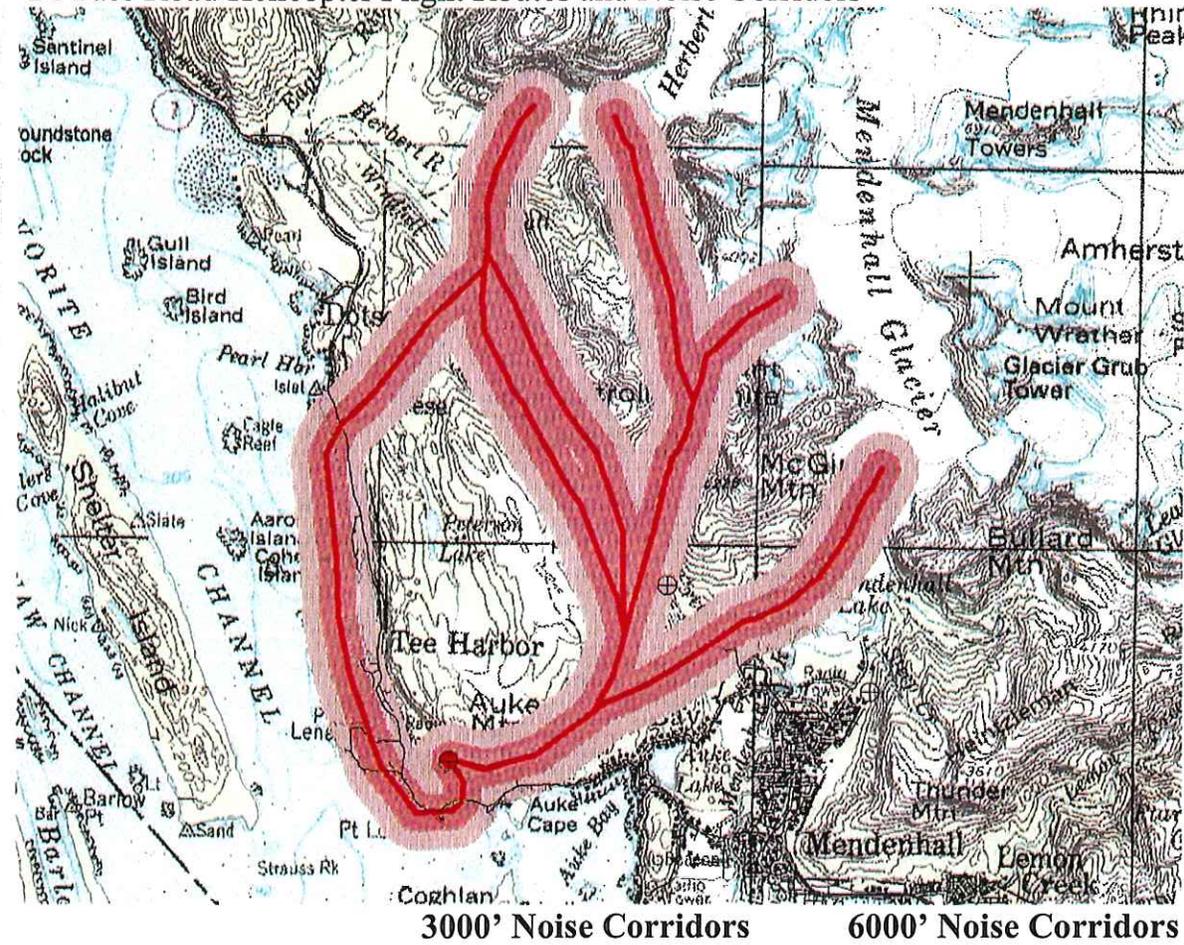
This area offers good access from either the Auke Recreational Cut Off Road or by the newly constructed Auke Recreational Bi-Pass Road, not shown on map. Timber would need to be cleared and an access road and base facilities would need to be constructed. City water and electric hook up are easily accessible; a facility septic system would also be needed.

Since it is located just off of Auke Bay, the terrain is relatively clear to the south; however, the area is just to the north of the westerly approaches and departures at the Juneau airport. Being at a relatively low elevation, the site would remain below most of the low scattered or broken ceilings that tend to make up the inclement weather in the area. With the adjacent terrain protecting the site from the north, winds would be a relatively small factor at the Auke Recreational Area site.

Approaches and departures would be inside the existing Class E airspace at the Juneau Airport. However, aircraft following the standard instrument approach procedures for Runway 8 would still be at about 2,000 feet MSL abeam this location. Typical flight paths for the flightseeing tours would remain to the north of the airport approach, and would produce minimal airspace conflicts with Juneau airspace or IFR approach/departure procedures. The Auke Recreational Area site would be able to meet the requirements set forth in FAA AC 150/5390-2A Heliport Design.

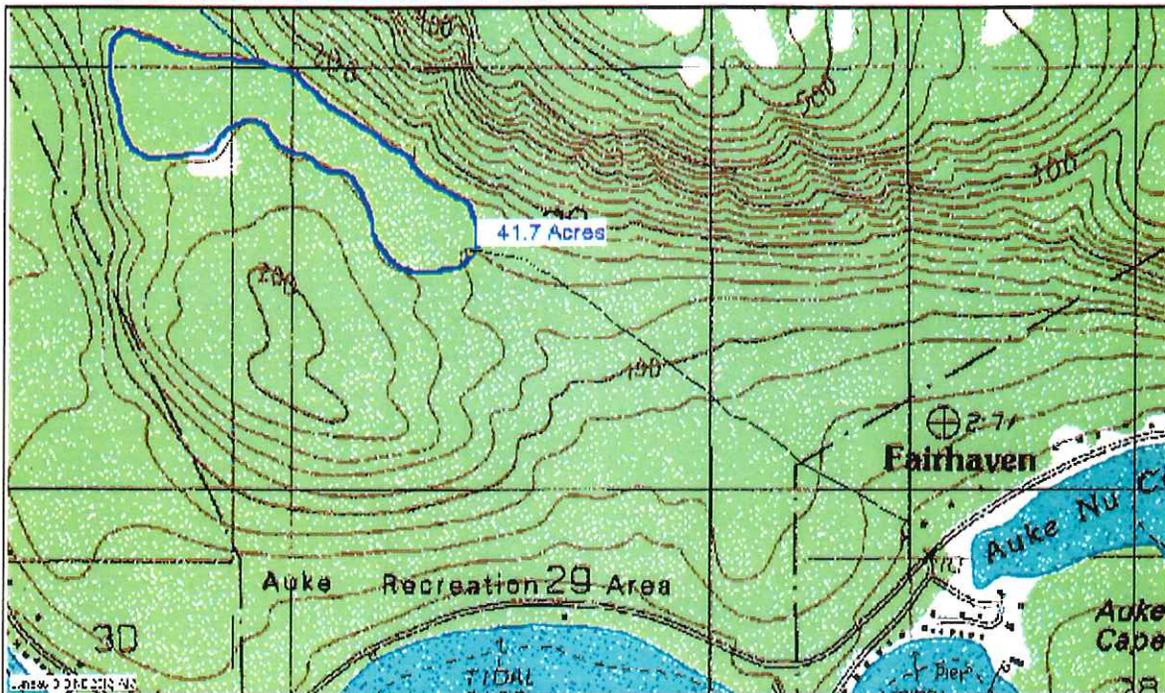
Because the sites at the Auke Rec. Cut Off Rd and the Auke Rec Bi-Pass are so close to each other, both were evaluated based on the same set of flight lines (Figure 4.3.1.2). Approximately 202 housing units would be within the 3,000-foot noise footprint (roughly 65 dBA) and 496 housing units would be within the 6,000 foot noise footprint (roughly 55 dBA).

Figure 4.3.1.2 Auke Recreational Area Cut Off Road and Auke Recreational Bi-Pass Road Helicopter Flight Routes and Noise Corridors



	3000' Noise Corridors	6000' Noise Corridors
Affected Land Parcels	256	619
Affected Housing Units	202	496

4.3.2 Auke Recreational Bi-Pass



Land Ownership:	National Forest Land uplands on the 41.7 acre site.	
Physical:	Two 12 to 20 acre site	
Terrain Features:	Relatively flat timbered upland saddle.	
Adjacent Terrain Features:	Stephens Passage to the south, 1780' Auke Mountain to the northeast. Auke Recreational Area to the south. Residential areas down slope along coast to the southeast, south, and southwest.	
Existing Infrastructure:	Electricity	City Water
Access:	14 miles from Marine Park	21 minute drive from Marine Park
Road Description:	Northwest on Egan Highway, a four-lane freeway, for 9.5 miles. Egan turns into Glacier Highway, a two-lane road that continues northwesterly 5 miles to the Auke Recreational bi-pass road. An additional road would need to be constructed approximately .75 miles up slope to proposed site.	
Type of Traffic:	Commercial and residential traffic.	
Nearest Fire Station:	Auke Bay Fire Department, 3 miles.	

The Auke Recreational Bypass Road site is located approximately 5.5 miles west of the Juneau Airport at Indian Cove. The general site is composed of a relatively level and linear site of about 42 acres, and ranges from elevation 420 to 480 feet MSL. The grade slopes steeply to the north toward Auke Mountain at about

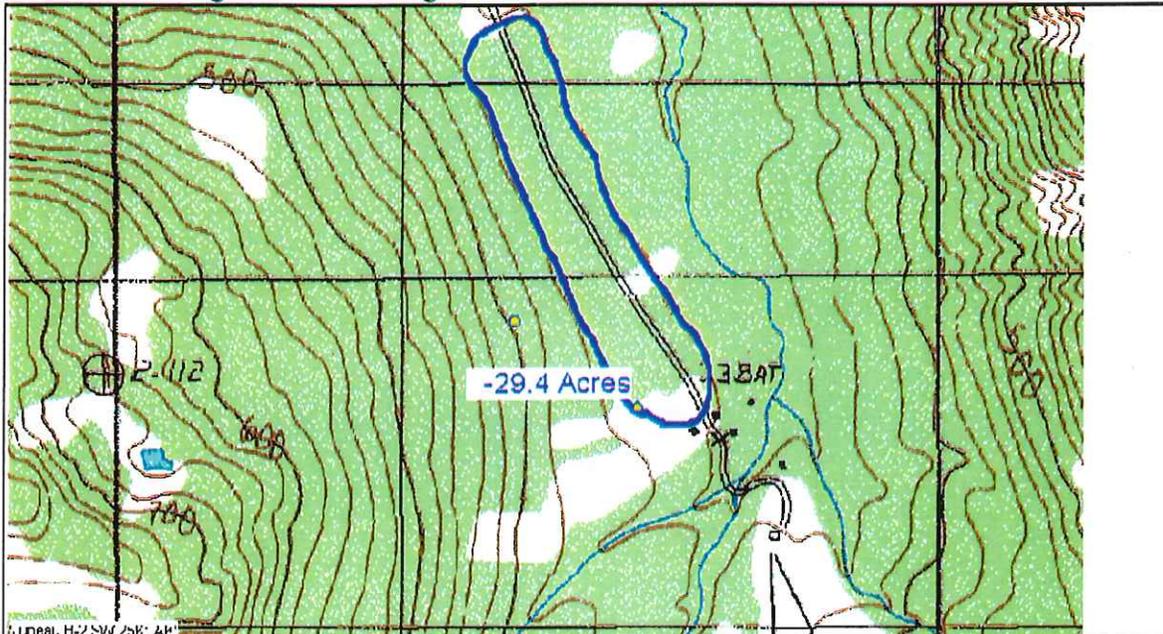
elevation 1,870 feet MSL. Timber would need to be cleared and an access road and base facilities would need to be constructed. City water and electric hook up are easily accessible; a facility septic system would also be needed.

Since it is located near Auke Bay, the terrain is relatively clear to the south, with the exception of a small knob at elevation 690 feet MSL; however, the area is just to the north of the westerly approaches and departures at the Juneau airport. Being at a relatively low elevation, the site would remain below most of the low scattered or broken ceilings that tend to make up the inclement weather in the area. With the adjacent terrain protecting the site from the north, winds would be a relatively small factor at the Auke Recreational Bypass Road site.

Approaches and departures would be inside of the existing Class E airspace at the Juneau Airport. However, aircraft following the standard instrument approach procedures for Runway 8 would still be at about 2,000 feet MSL abeam this location. Typical flight paths for the flightseeing tours would remain to the north of the airport approach, and would produce minimal airspace conflicts with Juneau airspace or IFR approach/departure procedures. The Auke Recreational Bypass Road site would be able to meet the requirements set forth in FAA AC 150/5390-2A Heliport Design.

Because the sites at both the Auke Rec. Cut Off Road and the Auke Rec. Bi-Pass came so close to each other, they were evaluated based on the same set of flight lines (Figure 4.3.1.2). As with the Auke Recreational Area Cut-Off Road site discussed above, approximately 202 housing units would be within the 3,000 foot noise footprint (roughly 65 dBA) and 496 housing units would be within the 6,000 foot noise footprint (roughly 55 dBA).

4.3.3 Eaglecrest Parking Lot



Land Ownership:	City owned uplands		
Physical:	12 to 20+ acre site	1100' elevation	
Terrain Features:	Established ski area facility parking lot and surrounding area on upslope side of valley.		
Adjacent Terrain Features:	2500' to 3000' mountains surround to the west, south, and east.		
Existing Infrastructure:	Eaglecrest Lodge and maintenance shop.	Existing water treatment system.	Existing hydroelectric and diesel electric generation systems.
Access:	13 miles from Marine Park.	21 minute drive from Marine Park.	
Road Description:	Northwest on Egan Highway, a four-lane freeway, for 1.1 miles. West across the Douglas Bridge to North Douglas Highway, a two lane road, 6.9 miles. South on the Eaglecrest, two lane, road 5 miles.		
Type of Traffic:	Commercial and residential traffic.		
Nearest Fire Station:	Downtown Juneau Fire Department, 12 miles.		

The Eaglecrest Parking Lot site is located approximately 6.0 miles southeast of the Juneau Airport at the Eaglecrest Ski Lodge. The general site is composed of a relatively level and linear site of about 29 acres at elevation 1,100 feet MSL. The grade slopes steeply up on most sides of the site to ridges ranging in elevation of 2,500 to 4,000 feet MSL. The access drive follows Fish Creek from a location directly across the Gastineau Channel from the Juneau Airport. The development of this site would be the least costly of all sites under consideration, due to existing Eaglecrest Ski Area infrastructure. The summer use of the area by a flightseeing heliport and the winter use by the ski area could dovetail, with mutual advantage to both.

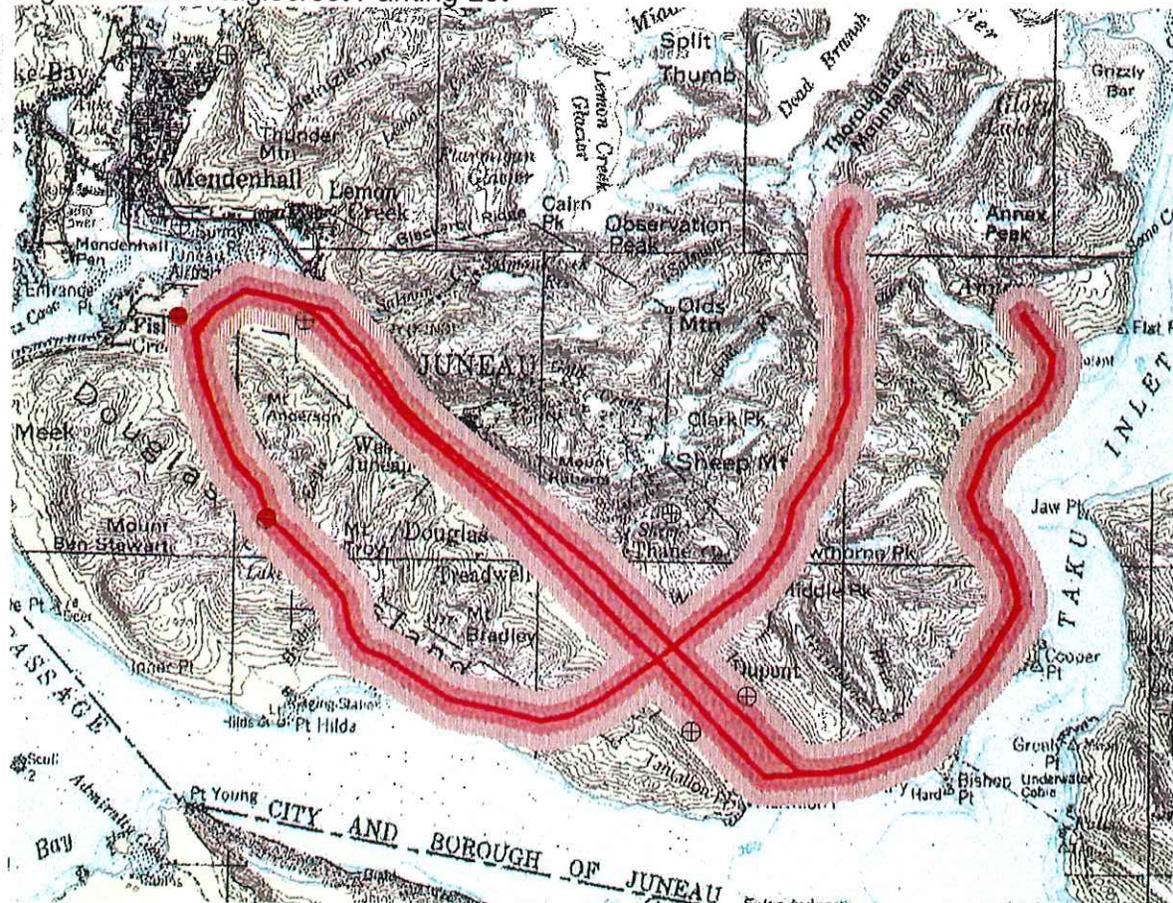
This site offers good access with the existing two lane paved road. Base facilities would need to be constructed adjacent to the existing parking lot, but a modification of the existing lodge might be possible. Water, electric and septic systems are developed for the Eaglecrest Base Lodge and could be made available for a heliport operation. On good weather days, helicopters could fly south through the cut in the Douglas ridgeline to the west side of Douglas Island, crossing back over the Douglas ridgeline and heading up the Sheep Creek Valley. Approximately 17 housing units would be within the 3,000 foot noise footprint (roughly 65 dBA) and 6 additional housing units would be within the 6,000 foot noise footprint (roughly 55 dBA) (Figure 4.3.3.2). If the helicopters did not cut back over the Douglas ridgeline, it would eliminate noise impacts on any residences other than the Eaglecrest caretaker's cabin (where it would be very noisy). That would be a longer, more expensive route for the helicopters to fly, and it is unlikely the operators would do so.

Unfortunately these advantages are outweighed by the difficulties presented by bad weather. With the approach and departure path routed through a relatively narrow approach at elevation 1,100 feet MSL, the site would be significantly affected by the common low scattered or broken ceilings that tend to make up the inclement weather in the area. Because of its elevation, helicopters would be fogged in at (or out of) the site many days when they could otherwise fly. With the adjacent terrain protecting the site from the every side, winds would be a relatively small factor at the upper Eaglecrest site.

Approaches and departures would be inside the existing Class D/E airspace at the Juneau Airport directly abeam Runway 8-26, requiring an ATCT clearance, unless the weather was such that the aircraft could climb over the ski slope area and travel along the southwest side of Douglas Island. Typical flight paths for the

flightseeing tours would either pass down Gastineau Channel or stay well south of the airport, depending on weather. Given that the weather would typically affect access to this site, significant airspace conflicts could be expected with Juneau airspace and IFR approach/departure procedures. The Eaglecrest Parking Lot site would be able to marginally meet the requirements set forth in FAA AC 150/5390-2A Heliport Design.

Figure 4.3.3.2 Eaglecrest Parking Lot



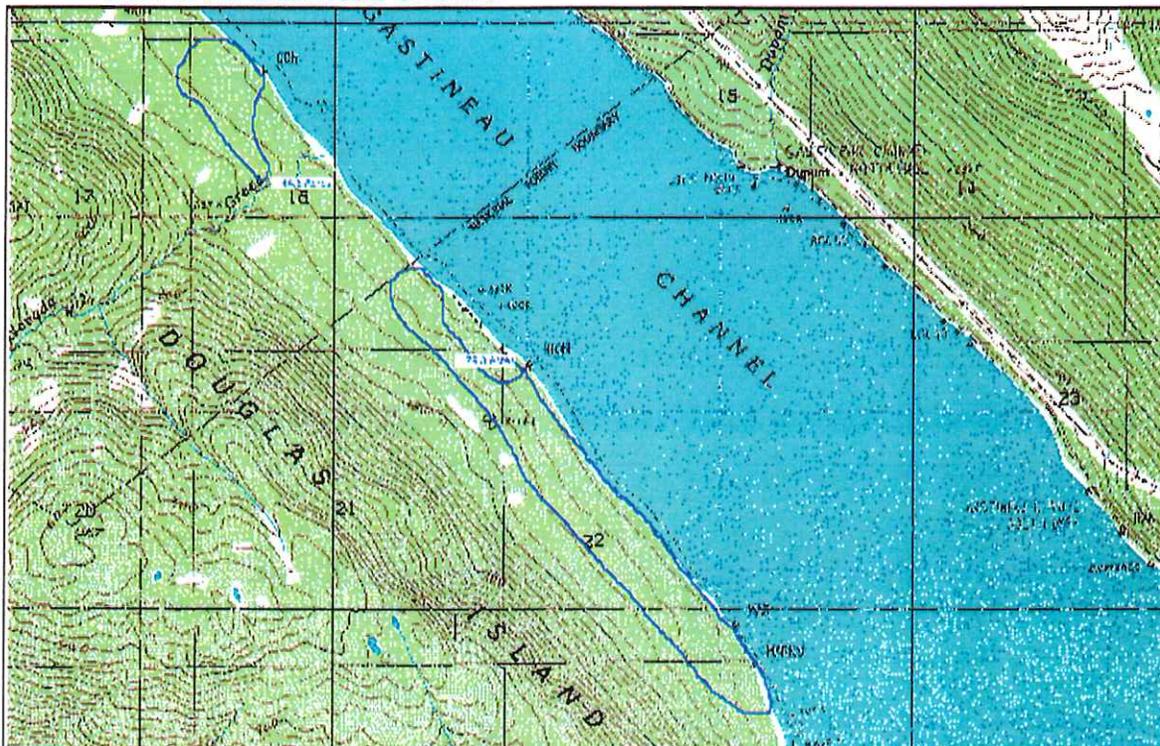
3000' Noise Corridors 6000' Noise Corridors

Affected Land Parcels	1241	2975
Affected Housing Units	1819	3934

On days when the weather allowed helicopters to fly, but the ceiling was not high enough for them to go through the cut to the west side of Douglas, the flight route would be down the valley and down Gastineau Channel to link with current established routes continuing down the channel. The number of affected housing units would be greater than flight paths currently being operated out of the ERA

Base (3,777). Approximately 1819 housing units would be within the 3,000 foot noise footprint (roughly 65 dBA) and 3934 housing units would be within the 6,000 foot noise footprint (roughly 55 dBA). There are 3,777 residences within the 6,000 foot noise footprint of the existing ERA routes.

4.3.4 West Gastineau Channel



Land Ownership:	City owned uplands	
Physical:	12 to 20+ acre site	20' to 70' elevation
Terrain Features:	Gradually sloping upland timbered area along southeast shore of Douglas Island.	
Adjacent Terrain Features:	1900' mountain / ridgeline to the west. Gastineau Channel running northwest, southeast. Lucky Me residential development is located between proposed north and south City owned properties.	
Access:	10 miles from Marine Park	
Marine Route	Connection made by ferry transport from Marine Park Area.	
Type of Traffic:	Commercial and recreational marine vessels.	
Nearest Fire Station:	Douglas Fire Department, 8 miles.	

The West Gastineau Channel site is located approximately 7.5 miles southeast of downtown Juneau on the southwest side of the Gastineau Channel across from the mouth of Dupont Creek. The site is gradually sloping and linear along the edge of the channel at an elevation of 20-70 feet MSL, with slopes to the southwest toward a ridgeline at 2,000 feet MSL at the south end of Douglas Island. The site has two areas of about 32 total acres available and is open to water toward the northeast.

Timber would need to be cleared and an access road and base facilities would need to be constructed. On-site electricity, water system and facility septic system would be needed.

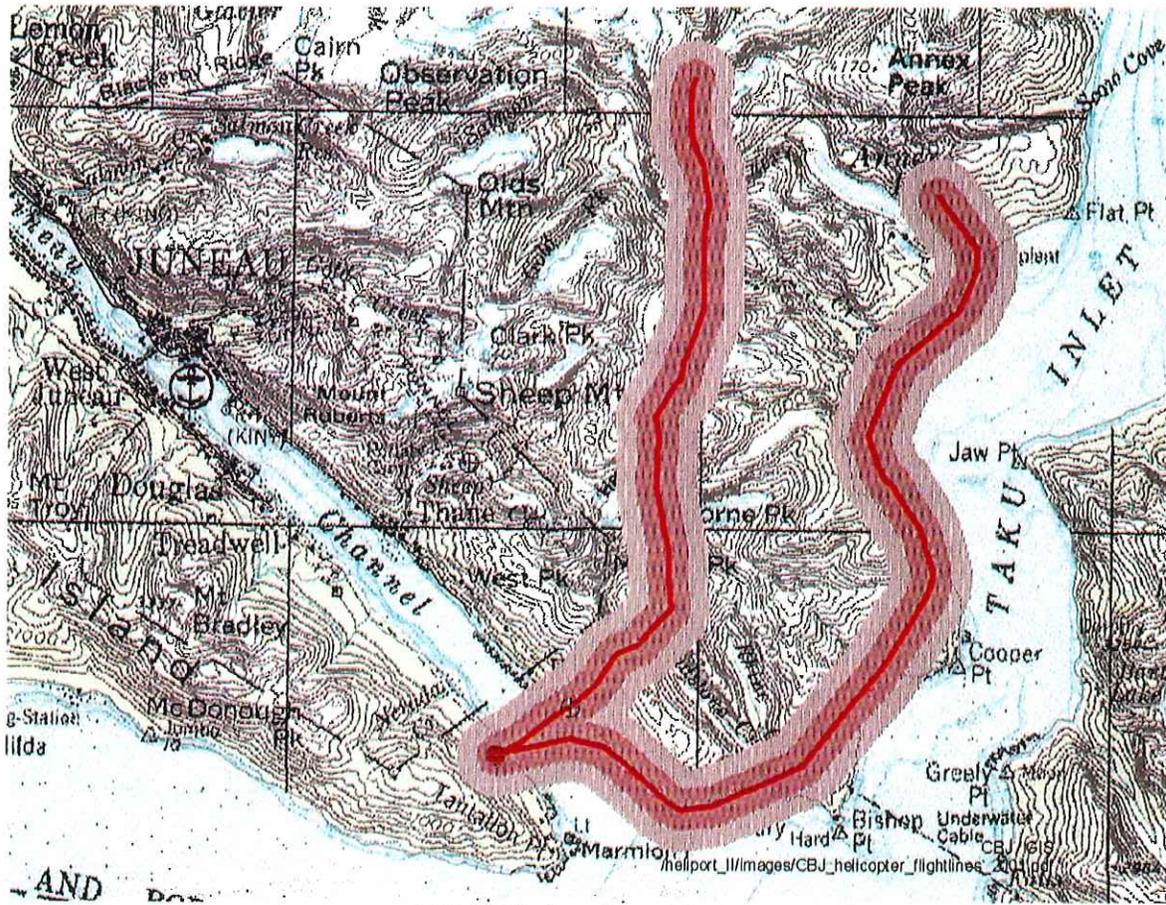
Since it is located along the Gastineau Channel, the airspace is relatively clear along the channel side (northwest and southeast), as well as for approximately one mile across the channel to the northeast, except for maritime traffic. The normal large ship route down the middle of the channel is approximately 2,500 feet from the east bank at that location; the 8:1 approach surface would clear about 300+ feet over the ship route, which would clear the channel for cruise and cargo ships. The FAR 77 heliport approach surfaces would be placed in east-southeasterly and north-northwesterly directions, angling into the channel to avoid ship traffic.

Being at a relatively low elevation, the site would remain below most of the low scattered or broken ceilings that tend to make up the inclement weather in the area. It is approximately 14 miles from the Juneau Airport along the final approach course to Runway 26 (or departure course from Runway 8). At 2.0 miles from the entrance to Gastineau Channel, approaching jet aircraft would be at approximately 5,000 feet MSL; departing flights would be higher. There would be no airspace conflicts with Juneau airspace or IFR approach/departure procedures. No matter how the traffic pattern was rearranged, however, either the inbound or outbound flightseeing helicopter routes would cross the floatplane routes. The West Gastineau Channel site would be able to meet the requirements in FAA AC 150/5390-2A Heliport Design.

Access to this area is limited. To gain land access, approximately five miles of new road would need to be constructed through timbered lands and access through or past Douglas would be difficult. Marine access is an alternative transportation method that could be used. The west shore of Gastineau Channel is more exposed to waves than the east side and slopes more gently than the east shore. A docking facility would either need to employ dredge and fill, or necessitate a dock and possibly a wave barrier that extend into the channel.

Helicopter noise would be inaudible or negligible for all populated areas of the borough except for Lucky Me and the cabins near Marmion (See Figure 4.3.4.2). Noise impacts for these areas, however, would be considerably higher than from the Dupont site.

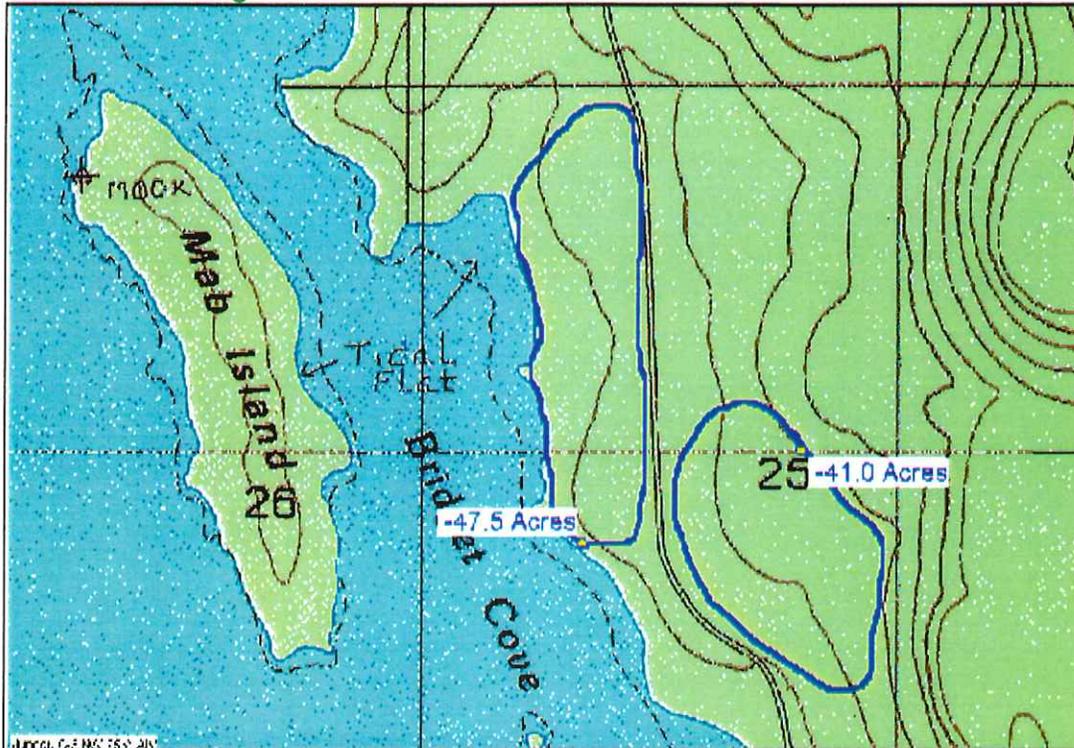
Figure 4.3.4.2



	3000' Noise Corridors	6000' Noise Corridors
Affected Land Parcels	12	13
Affected Housing Units	7	7

4.4 Level 2 Sites

4.4.1 Bridget Cove



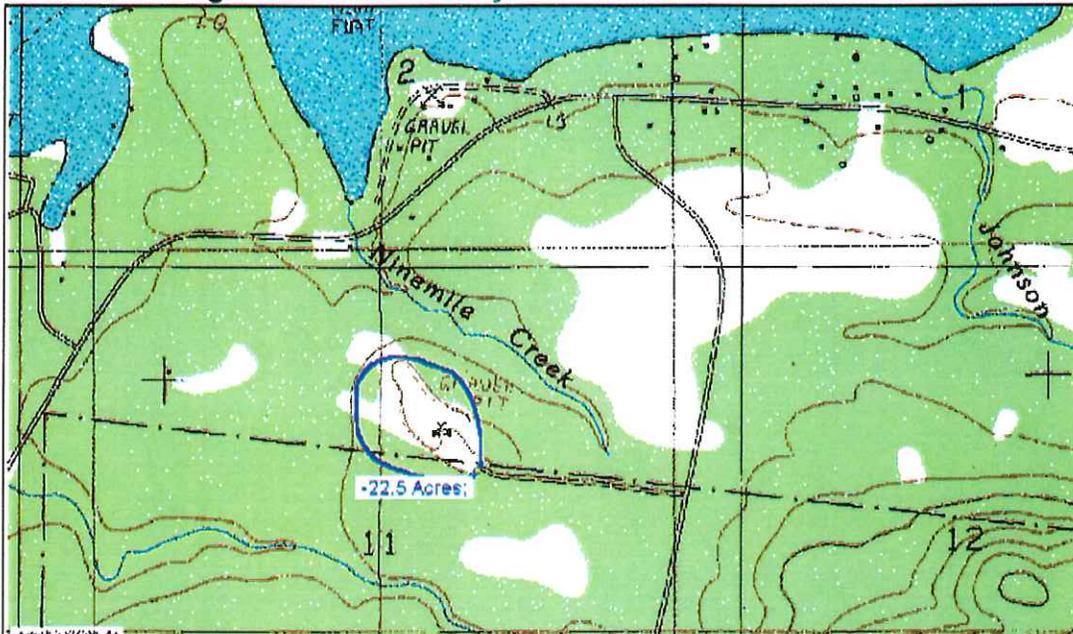
Land Ownership:	City owned uplands	
Physical:	12 to 20+ acre site	0' to 60' elevation
Terrain Features:	Gradually sloping timbered area.	
Adjacent Terrain Features:	< 600' hills to the north and southeast. Favorite Channel to the west. This is a recreational area. Private cabins border along the coast.	
Access:	38 miles from Marine Park	52 minute drive from Marine Park
Road Description:	Northwest on Egan Highway, a four-lane freeway, for 9.5 miles. Egan turns into Glacier Highway, a two-lane road that continues northwesterly 24.5 miles.	
Type of Traffic:	Commercial and residential traffic.	
Nearest Fire Station:	Lynn Canal Fire Station, 19 miles.	

Bridget Cove had two sites that were considered as alternative heliport sites. They are located east of Bridget Cove off of Cowee Creek in relatively low and level terrain. The sites are 38 miles from Marine Park in down town and approximately 26 air miles northwest of the Juneau Airport, well away from Juneau airspace. There are no weather or wind conditions that would be of greater concern relative to other sites. These sites would likely be able to meet the requirements of FAA AC 150/5390-2A Heliport Design.

The Bridget Cove sites offer good access from Glacier Highway. Timber would need to be cleared and an access road and base facilities would need to be constructed. On-site electricity, water system and facility septic system would be needed.

The round trip drive time for shuttle buses would be approximately 1 hour and 45 minutes, flight seeing trips are generally 1 hour long. The shuttle time involved would make it extremely difficult to convince operators to move to this site, and it does not offer any outstanding advantages not offered by other closer sites.

4.4.2 Eaglecrest Rock Quarry



Land Ownership:	City owned uplands	
Physical:	12 to 20+ acre site 20' to 40' elevation	
Terrain Features:	Relatively flat area with existing gravel quarry pit and surrounding muskeg meadows.	
Adjacent Terrain Features:		
Existing Infrastructure:	Electricity along North Douglas Highway.	City water along North Douglas Highway
Access:	9.5 miles from Marine Park.	14 minute drive from Marine Park
Road Description:	Northwest on Egan Highway, a four-lane freeway, for 1.1 miles. West across the Douglas Bridge to North Douglas Highway, a two lane road, 6.9 miles. South on the Eaglecrest, two lane, road 1.5 miles.	
Type of Traffic:	Commercial and residential traffic.	
Miles to Nearest Fire Station:	Downtown Juneau Fire Department, 8.5 miles.	

Eaglecrest rock quarry was considered as an alternative heliport site. This site offers good access with an existing one-lane gravel road off of the Eaglecrest Road. Base facilities would need to be constructed. City water and electric hook up are available at the intersection of the North Douglas Highway and Eaglecrest Road; a facility septic system would be needed.

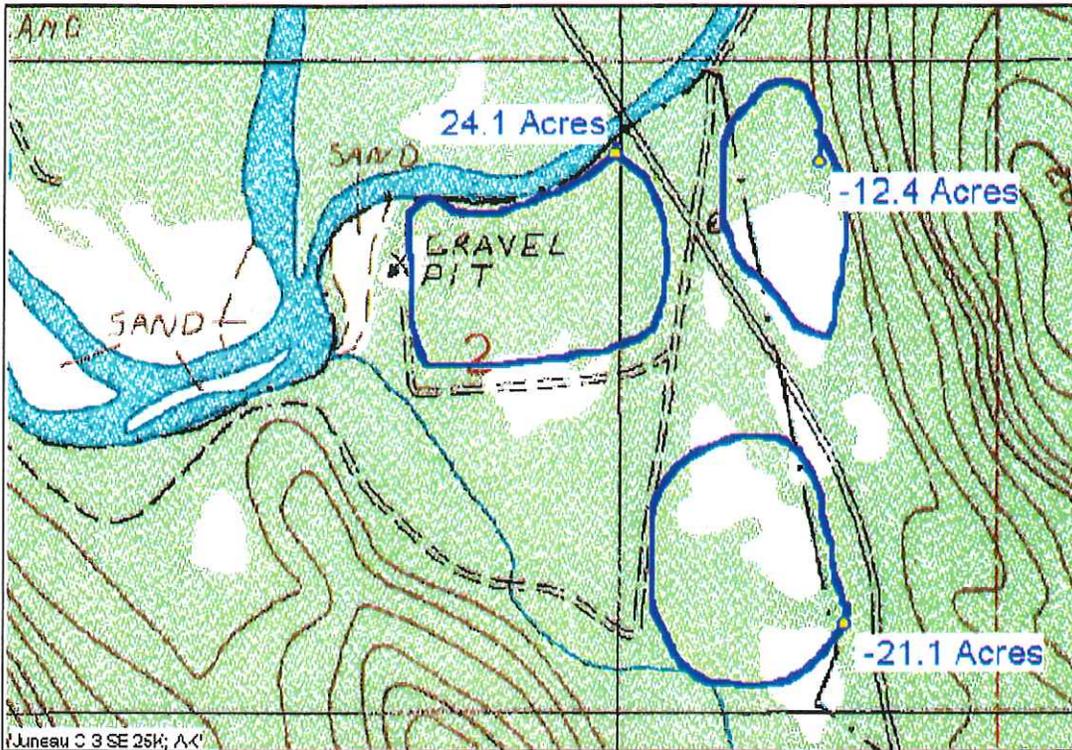
The rock quarry site is 2 miles immediately south of Juneau Airport in relatively low and level terrain. It is within the Class D airspace for the Juneau Airport and would require a clearance for all operations. There are no weather or wind conditions that would be of greater concern relative to other sites. This site would likely be able to meet the requirements of FAA AC 150/5390-2A Heliport Design.

On good weather days, when helicopters could fly south up the valley to Eaglecrest Ski Area and through the cut to the west side of Douglas Island, approximately 17 housing units would be affected at the 65 dBA level and 6 housing units at the 55 dBA level. There would be days that helicopters could fly down the Eaglecrest Road and Gastineau Channel when helicopters at the main Eaglecrest site would be grounded by fog.

Poor weather conditions, however, would force flight paths to utilize established routes down Gastineau Channel; the number of affected housing units would be greater than flight paths currently being operated out of the ERA Base. Approximately 1819 housing units would be affected at the 65 dBA level and 3934 housing units would be affected at the 55 dBA level.

This site lacks the established infrastructure of the upper Eaglecrest site.

4.43 Herbert River



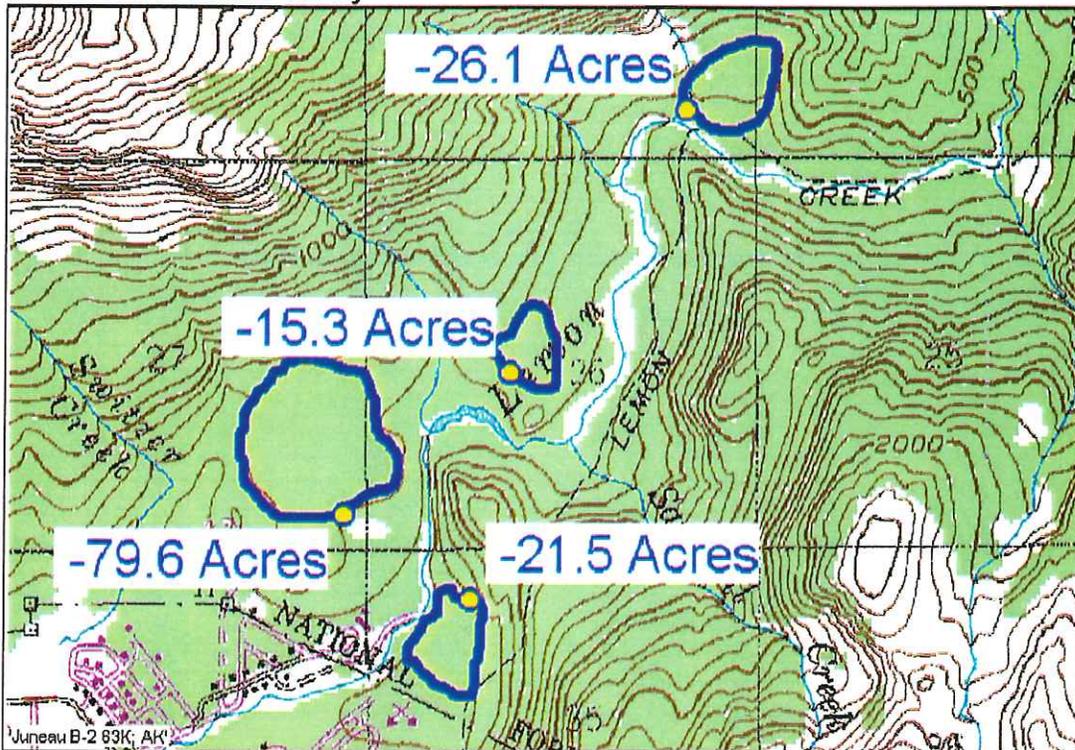
Land Ownership:	Channel Construction and National Forest Lands	
Physical:	12 to 20+ acre site	20' elevation
Terrain Features:	Flat low-lying area, which include timber, meadows and wetlands.	
Adjacent Terrain Features:	Flat low-lying areas with rolling hills <1500' elevation within 2-mile radius. Residential areas border to the south and west. Recreational areas border to the west, north, and east.	
Existing Infrastructure:	Electricity	
Access:	27 miles from Marine Park	37 minute drive from Marine Park
Road Description:	Northwest on Egan Highway, a four-lane freeway, for 9.5 miles. Egan turns into Glacier Highway, a two-lane road that continues northwesterly 17.5 miles.	
Type of Traffic:	Commercial and residential traffic.	
Nearest Fire Station:	Lynn Canal Fire Station, 10 miles.	

Herbert River had three areas that were considered as alternative heliport sites. All three sites are located east of Eagle Beach State Recreational Area, off the Herbert River in relatively low and level protected terrain. The sites are approximately 13 miles northwest of the Juneau Airport and well away from Juneau airspace. There are no weather or wind conditions that would be of greater concern relative to other sites. This site would likely be able to meet the requirements of FAA AC 150/5390-2A Heliport Design.

These sites offer good access from Glacier Highway. Clearing of timber, an access road, and base facilities would need to be constructed. Some filling of wetlands may be required. Electric hook up is easily accessible. A water system and facility septic system would be needed.

Herbert River offers an attractive alternative. However due to a distance of 27 miles from Marine Park in downtown Juneau, this site has been excluded. The round trip drive time for shuttle buses would be approximately 1 hour and 15 minutes, flight seeing trips are generally 1 hour long. The shuttle time involved would make it extremely difficult to convince operators to move to this site and it does not provide any outstanding advantages not offered by other closer sites.

4.4.4 Hidden Valley



Land Ownership:	City owned uplands on the southern 79.6 acre and 21.5 acre sites. City and Seccon owned lands comprise the 15.3 acre site. The northern Hidden Valley site is Gold Belt and National Forest Lands.	
Physical:	12 to 20+ acre sites	40' to 400' elevation possible
Terrain Features:	This glacially formed U shaped valley is timbered.	
Adjacent Terrain Features:	Lemon Creek Hidden Valley is surrounded on the north, west, and east sides by steep mountains and ridgelines ranging from 2500' to 4885'. Lemon Creek State Prison and a Commercial / Industrial Park border these areas. Residential areas are within close proximity.	
Existing Infrastructure:	Electricity available in developed commercial area	City water and sewer available in developed commercial area
Access:	7 miles from Marine Park	10 to 15 minute drive time from Marine Park
Road Description:	Northwest on Egan Highway, a four-lane freeway, for 5.5 miles. Northeast on Old Glacier Highway, a two-lane road, for .8 miles. Northeast into Lemon Creek industrial area along the east side of	

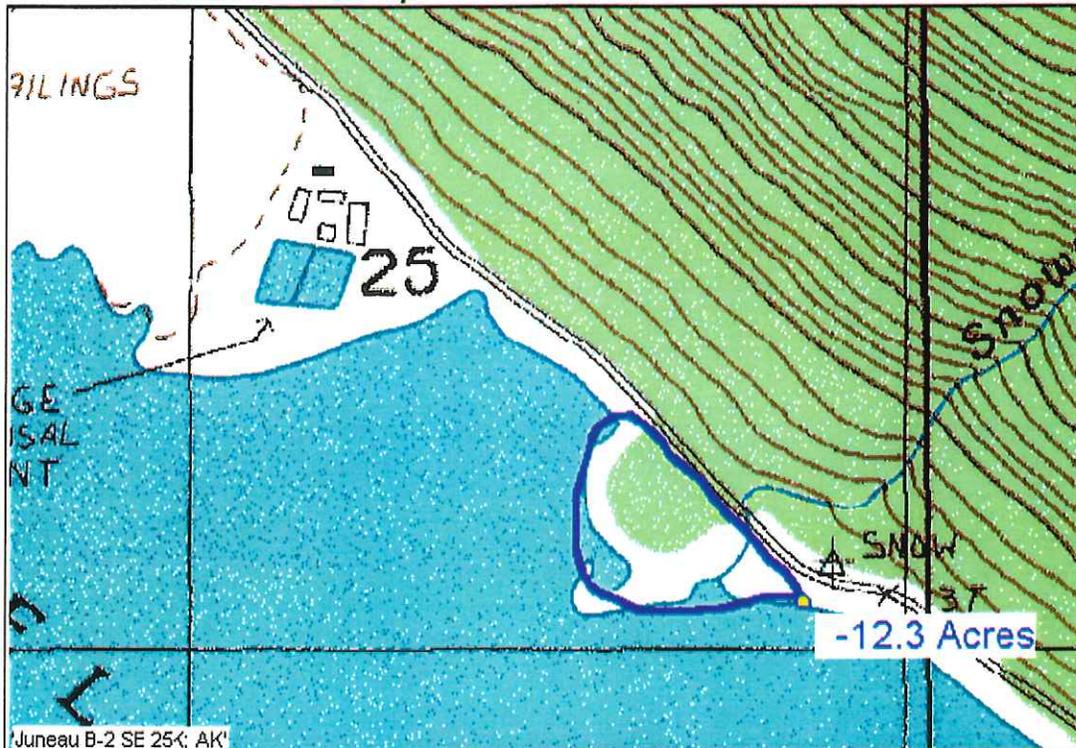
	Lemon Creek and crossing Lemon Creek 1.8 miles from turning off Old Glacier Highway. The upper section of road along Lemon Creek is a gravel road.
Type of Traffic:	Commercial traffic the entire route. Residential Traffic to the Lemon Creek Industrial area turn off.
Nearest Fire Station:	Glacier Valley Fire Department, 3.5 miles.

The Lemon Creek-Hidden Valley site is located northeast of the Gastineau Channel between the Heintzleman and Blackerby Ridges off Lemon Creek at medium elevation and on relatively level terrain. It is approximately 4 miles northeast of the Juneau Airport and would require an ATCT clearance for Juneau airspace to reach the channel. The Lemon Creek Hidden Valley offers areas along an existing gravel road extending three miles up the valley past the industrial area. Clearing of timber and base facilities would need to be constructed. City water, sewer and electric hook up are accessible.

This would be an excellent location if weather would allow routes up and onto the icefield to be flown regularly. Unfortunately that is not the case. Topography influences local weather conditions in Hidden Valley. Hidden Valley is a glacially formed U-shaped valley. Lemon Glacier and Ptarmigan Glaciers are hanging glaciers located at the end of the valley. Cold air flows down off the glaciers into Hidden Valley, often creating localized fog and clouds in the valley.

No formal statistical information is available on the fog and cloud levels and frequencies in Hidden Valley. Numerous informal conversations were held with flightseeing tour operators, residents, and CBJ staff who view this area regularly. A general consensus was that flights would be able to fly up over the Lemon Glacier less than 50 percent of the time. This would mean a majority of the flights would be flying down Gastineau Channel creating noise impacts for many additional residents. Low weather visibility conditions would also force operations to shut down on occasion and may force returning helicopters to land elsewhere if conditions deteriorated from time of departure.

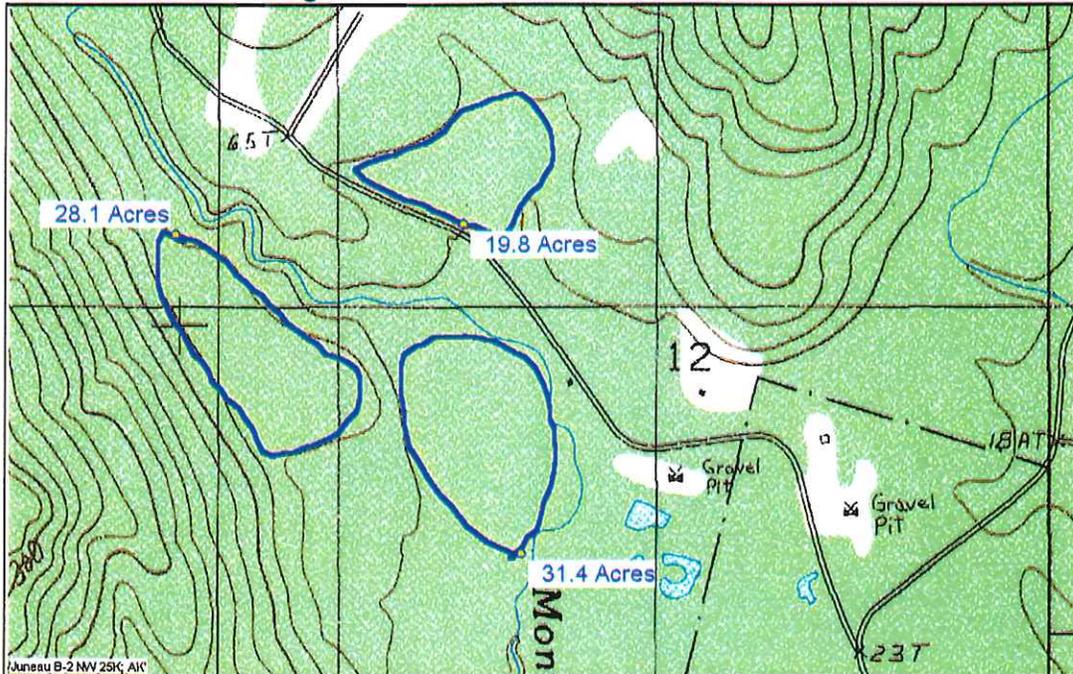
4.4.5 Little Rock Dump



Land Ownership:	City owned uplands and tidelands	
Physical:	8.1 acres	0' to 50' elevation
Terrain Features:	Rock dump filled area	
Adjacent Terrain Features:	Commercial park to the northwest. 3666' Gastineau Peak steeply rising to the northeast.	
Existing Infrastructure:	Electricity	City water and sewer at Big Rock Dump.
Access:	1.5 miles from Marine Park	4 minute drive from Marine Park
Road Description:	Thane road, a two lane-winding road with a slight shoulder.	
Type of Traffic:	Commercial traffic extends to the Sheep Creek Mine cut off. Residential traffic extends to end of road.	
Nearest Fire Station:	Downtown Juneau Fire Station, 1.75 miles.	

The Little Rock Dump site is located on the northeast side of the Gastineau Channel. The terrain is low and level. It is approximately one mile south of downtown Juneau, and 8 miles southeast of the Juneau Airport, under the final approach path to Runway 26 and adjacent to the Juneau Harbor seaplane port. There are no weather or wind conditions that would be of greater concern relative to other sites. This site would likely be able to meet the requirements of FAA AC 150/5390-2A Heliport Design. The site offers sufficient land adjacent to Thane Road. Base facilities would need to be constructed. Electric hook up is available. City water and sewer extend to the Big Rock Dump, directly to the northwest. This site would shift major noise impacts to Douglas residents.

4.4.6 Rifle Range Flats



Land Ownership:	City owned uplands	
Physical:	12 to 20 acre site 20' to 80' elevation	
Terrain Features:	Montana Creek Drainage is a glacially-formed forested valley that opens up into the Mendenhall Valley.	
Adjacent Terrain Features:	Mount McGinnis @ 4228' to the north and 2008' mountain to northwest. The Rifle Range borders to the north and scattered residential areas are to the south.	
Existing Infrastructure:	Electricity at Rifle Range	City water and sewer at Rifle Range
Access:	14.4 miles from Marine Park	23 minute drive time from Marine Park
Road Description:	Northwest on Egan Highway, a four-lane freeway, for 9.2 miles. Northeast on Mendenhall Loop Road, a two-lane road, for 2.2 miles. West on Back Loop Road, a two-lane road, for 1.5 miles. North West on Montana Creek Road, a two-lane road for 1.5 miles.	
Type of Traffic:	Commercial and residential traffic.	
Nearest Fire Station:	Glacier Valley Fire Department, 6 miles.	

Three areas, collectively called Rifle Range Flats, were considered as

Alternative Heliport Assessment
for the
City and Borough of Juneau

Michael Baker Jr., Inc.
FINAL REPORT
September 24, 2001

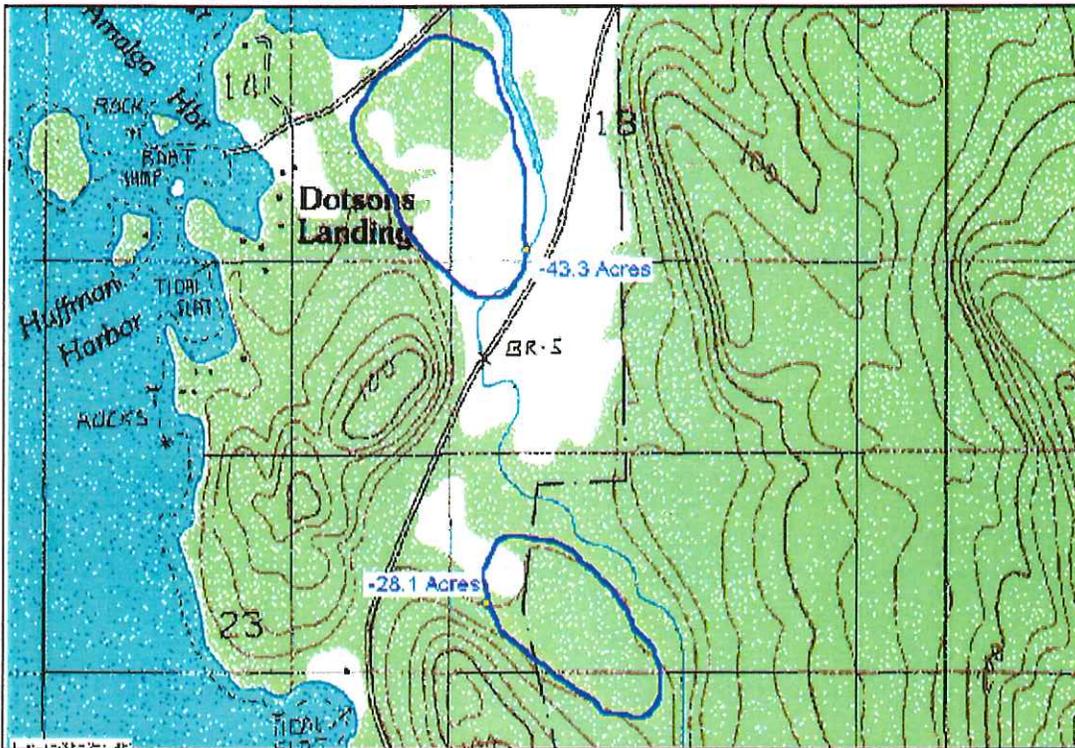
alternative heliport sites. The sites are located approximately 5.2 miles northwest of the Juneau Airport, west of Mendenhall Lake. Any of these sites would likely be able to meet the requirements of FAA AC 150/5390-2A Heliport Design.

This area offers good access from Montana Creek Road. Clearing of timber, access roads and base facilities would need to be constructed. Depending on the site, filling of wetlands may be required. Electrical hook up is available, a facility water and septic system would be needed.

Rifle Range Flats and Montana Creek Road are in close proximity to each other. For this reason both areas were evaluated based on the same set of flight lines. 3000' and 6000' noise contours were applied to each flight path. Approximately 14 housing units would be affected at the 55 dBA level.

These sites did not offer any significant advantage over the recommended Montana Creek site and proximity to the rifle range is a potential liability.

4.4.7 Peterson Creek



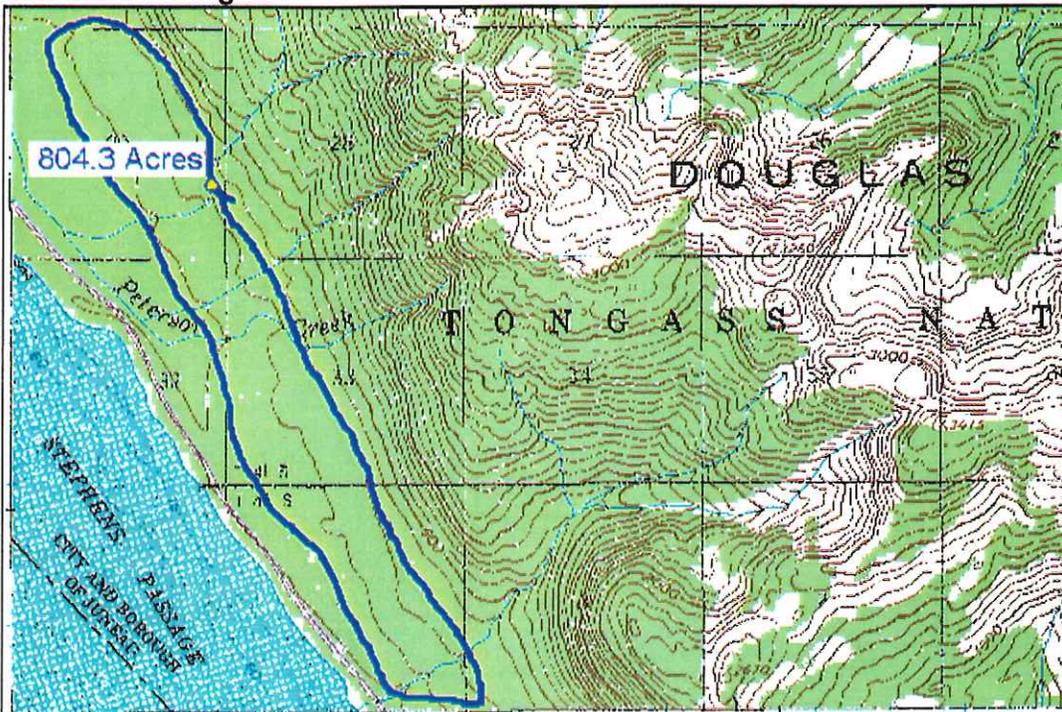
Land Ownership:	City owned uplands	
Physical:	12 to 20+ acre site 10' to 60' elevation	
Terrain Features:	Gradual sloping timbered valley that opens up into meadows and wetlands. Residential and recreation areas border this site.	
Adjacent Terrain Features:	Rolling hills up to 1840' within 3 mile radius.	
Existing Infrastructure:	Electricity	
Access:	24 miles from Marine Park	33 minute drive from Marine Park
Road Description:	Northwest on Egan Highway, a four-lane freeway, for 9.5 miles. Egan turns into Glacier Highway, a two-lane road that continues northwesterly 14.2 miles.	
Type of Traffic:	Commercial and residential traffic.	
Nearest Fire Station:	Lynn Canal Fire Station, 6 miles.	

Two sites near Peterson Creek were considered. Both sites are located east of Pearl Harbor, off of Peterson Creek in relatively level terrain. These sites offer good access from Glacier Highway. Clearing of timber, an access road, and base facilities would need to be constructed. Electric hook up is easily accessible. A water system and septic system would be needed.

These sites are approximately 11 miles northwest of the Juneau Airport and well away from Juneau airspace. There are no weather or wind conditions that would be of greater concern relative to other sites. Either site would likely be able to meet the requirements of FAA AC 150/5390-2A Heliport Design.

Peterson Creek is 24 miles from Marine Park. The round trip drive time for shuttle buses would be approximately 1 hour and 10 minutes. The shuttle time involved would make it extremely difficult to convince operators to move to either of these sites, and they do not offer any outstanding advantages not offered by other closer sites.

4.4.9 West Douglas



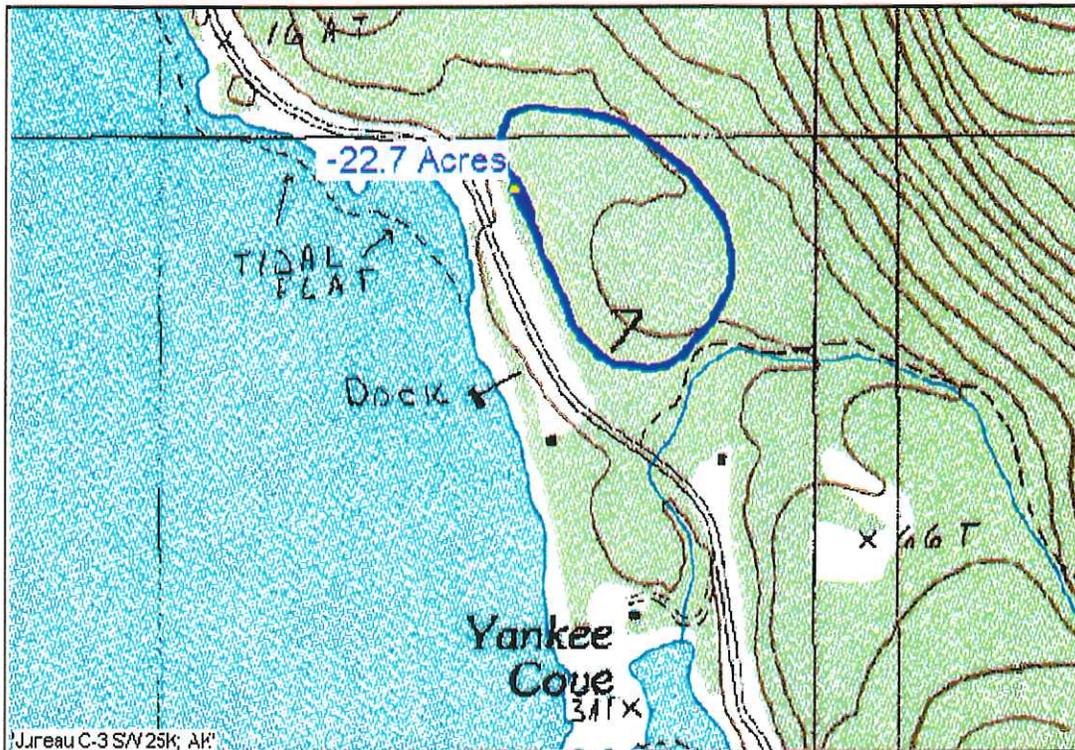
Land Ownership:	City owned uplands	
Physical:	12 to 20+ acre sites 100' to 400' elevation	
Terrain Features:	Gradually sloping upland timbered area paralleling shoreline.	
Adjacent Terrain Features:	2500' to 3000' steeply rising mountains to the east.	
Access:	14+ miles from Marine Park	20+ minute drive from Marine Park
Road Description:	Northwest on Egan Highway, a four-lane freeway, for 1.1 miles. West across the Douglas Bridge to North Douglas Highway, a two lane road, 12.9 miles to end of road. A connecting road from selected site to termination of North Douglas Highway would be necessary.	
Type of Traffic:	Commercial and residential traffic.	
Nearest Fire Station:	Downtown Juneau Fire Department, 14+ miles.	

The City and Borough of Juneau owns over 800 acres on the back side of Douglas that were considered as alternative heliport locations. The particular West Douglas site we examined is located on the northwest side of Douglas Island, off of Peterson Creek in relatively low and level terrain adjacent to Stephens Passage. All of the potential West Douglas sites would need major road construction to reach them and they could not be conveniently reached by water transportation from the Juneau Harbor. In addition to access road construction, timber would need to be cleared and base facilities constructed. Local power generation, water system and facility septic system would also be needed.

The West Douglas site is approximately 6 miles south of the Juneau Airport and away from Juneau airspace; but would require an ATCT clearance to traverse Class D airspace when accessing sites to the north of the airport. There are no weather or wind conditions that would be of greater concern relative to other sites. This site would likely be able to meet the requirements of FAA AC 150/5390-2A Heliport Design.

In addition to the major access problems, West Douglas has been identified by the City and Borough as a future growth area. Creating a heliport in this area would remove most noise impact at present time, however noise problems would arise if this area develops as planned.

4.4.10 Yankee Cove



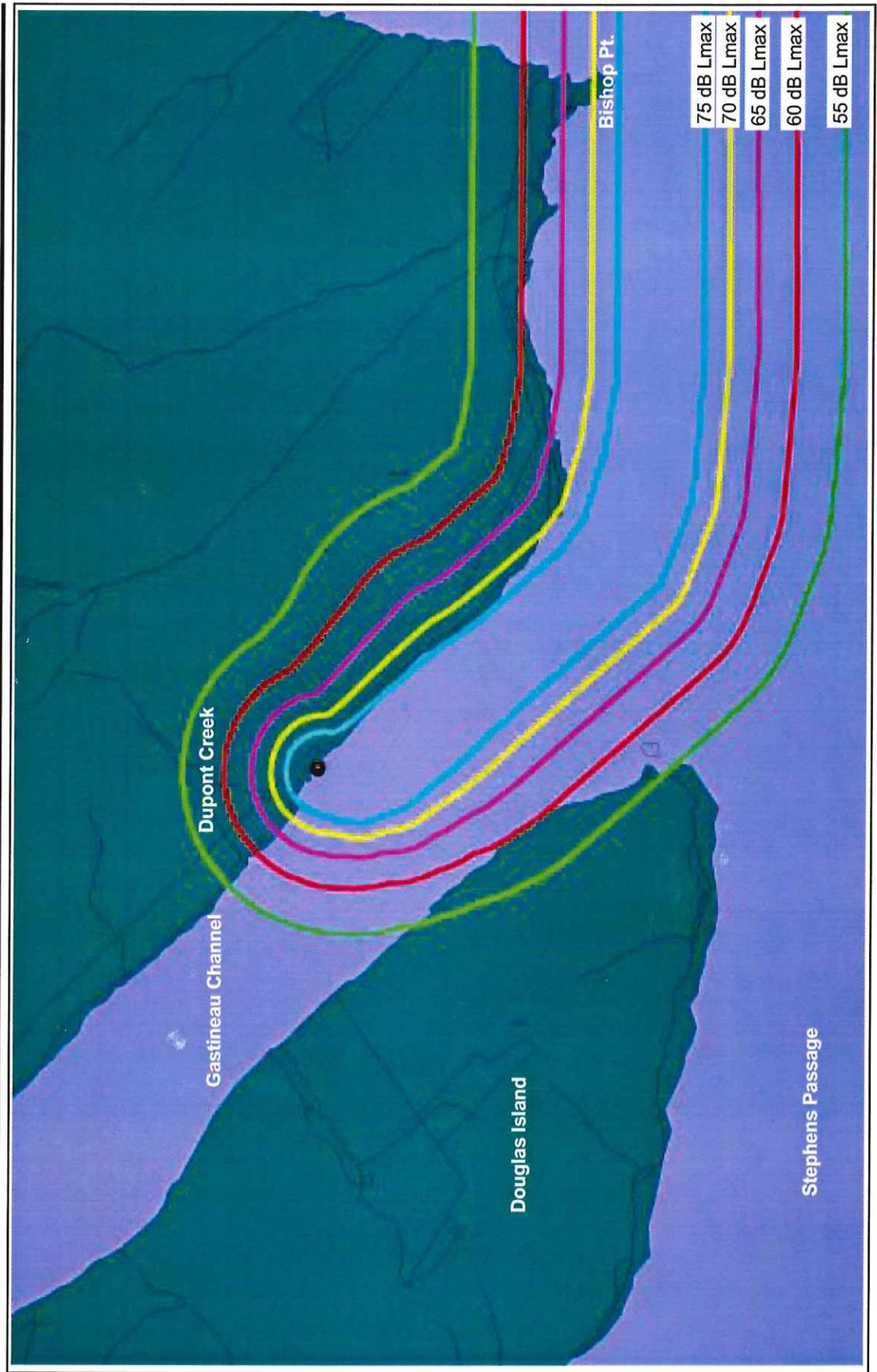
Land Ownership:	City owned uplands
Physical:	12 to 20+ acre site possible. 20' to 80' elevation.
Terrain Features:	Gradual sloping area.
Adjacent Terrain Features:	Steep 1500' mountains to the north; 2500' mountain to the southeast. Favorite Channel to the west. Residential and commercial businesses are in this area.
Access:	34 miles from Marine Park. 48 minute drive from Marine Park.
Road Description:	Northwest on Egan Highway, a four-lane freeway, for 9.5 miles. Egan turns into Glacier Highway, a two-lane road that continues northwesterly 24.5 miles.
Type of Traffic:	Commercial and residential traffic.
Nearest Fire Station:	Lynn Canal Fire Station, 15 miles.

The Yankee Cove site is a twenty plus acre site located east of Yankee Cove off of Bessie Creek. It is on relatively low and level terrain adjacent to Favorite Channel. The site offers good access from Glacier Highway. Clearing of timber, an access road, and base facilities would need to be constructed. A water system and facility septic system would be needed.

The Yankee Cove site is approximately 22 miles northwest of the Juneau Airport and well away from Juneau airspace. There are no weather or wind conditions that would be of greater concern relative to other sites. This site would likely be able to meet the requirements of FAA AC 150/5390-2A Heliport Design.

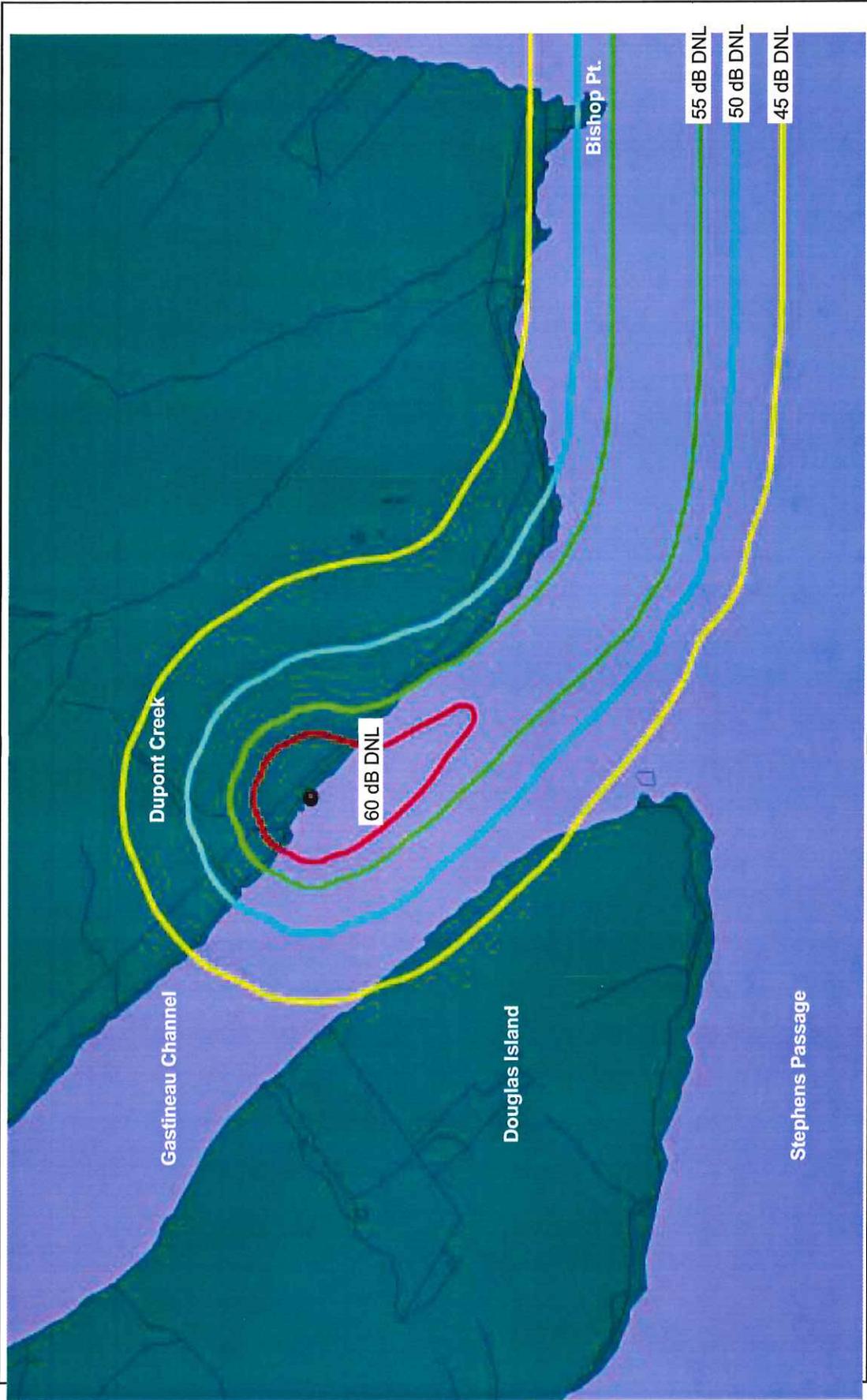
The distance from Marine Park is 34 miles and the round trip drive time for shuttle buses would be approximately 1 hour and 36 minutes. Flight seeing trips are generally 1 hour long. The shuttle time involved would make it extremely difficult to convince operators to move to this site, and it does not offer any outstanding advantages not offered by other closer sites.

Appendix A - 1
Combined Lmax Noise Contours for Dupont Site
Flightseeing Noise Assessment -- City and Borough of Juneau
Lmax Noise Contours -- 55 60 65 70 75 dBA



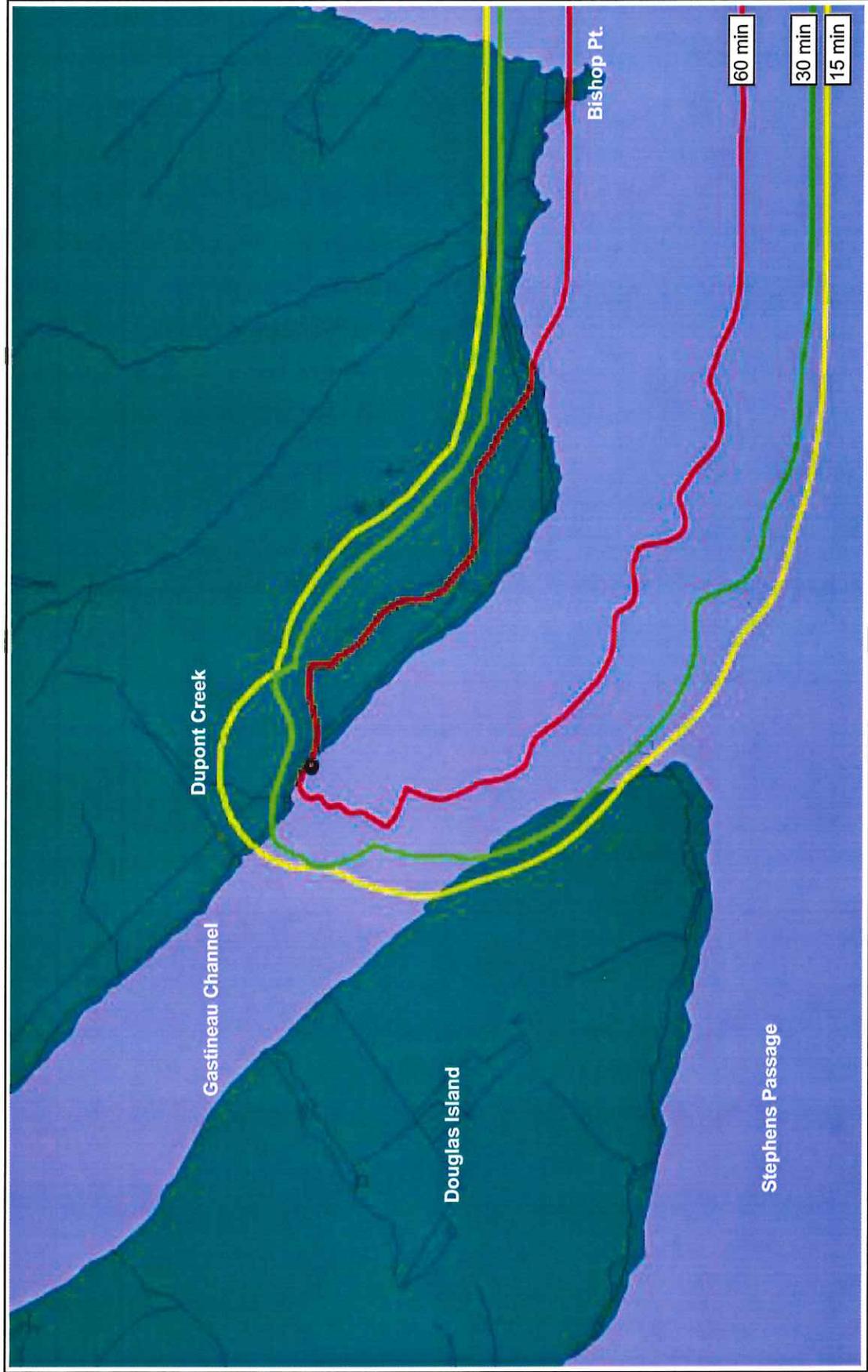
Appendix A - 2

DNL Noise Contours for Dupont Site
Flightsseeing Noise Assessment -- City and Borough of Juneau
DNL Noise Contours -- 45 50 55 60 DNL



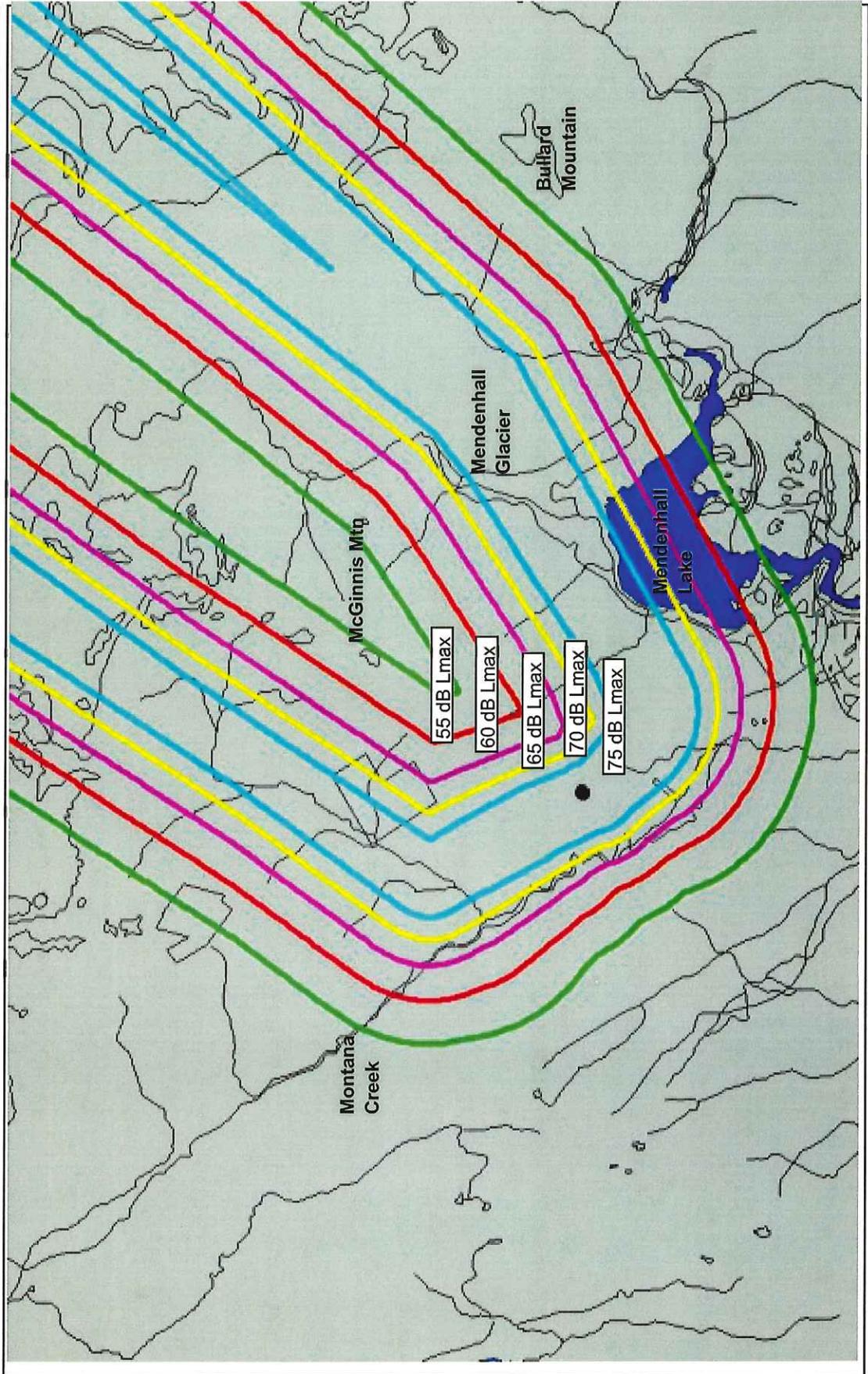
Appendix A - 3

Time Above 55 Noise Contours for Dupont Site
Flightseeing Noise Assessment -- City and Borough of Juneau
TA55 Noise Contours -- 15 30 60 Minutes per day



Appendix A - 4

Combined Lmax Noise Contours for Montana Creek Site
Flightsseeing Noise Assessment -- City and Borough of Juneau
Lmax Noise Contours -- 55 60 65 70 75 dBA

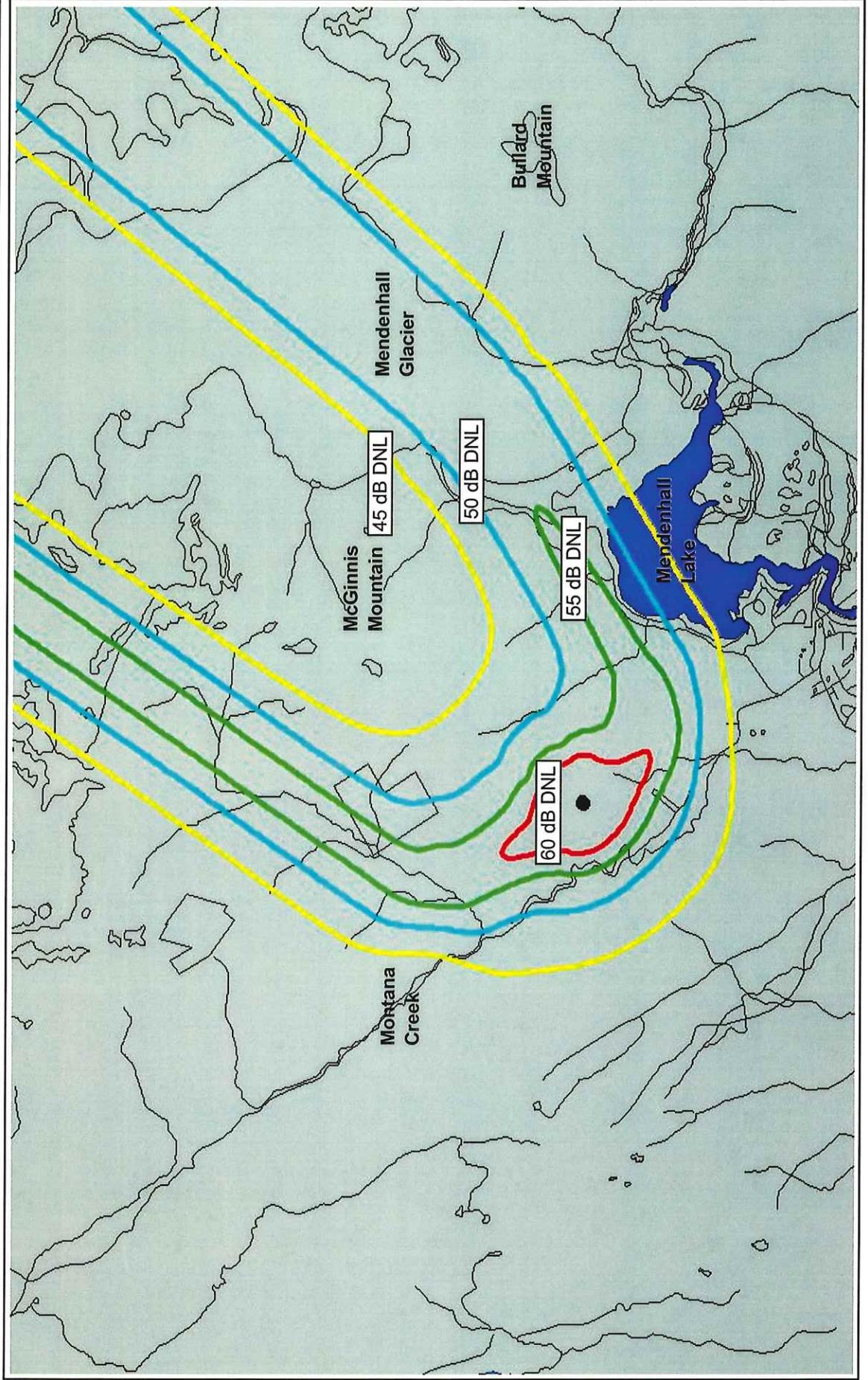


Appendix A - 5

DNL Noise Contours for Montana Creek Site

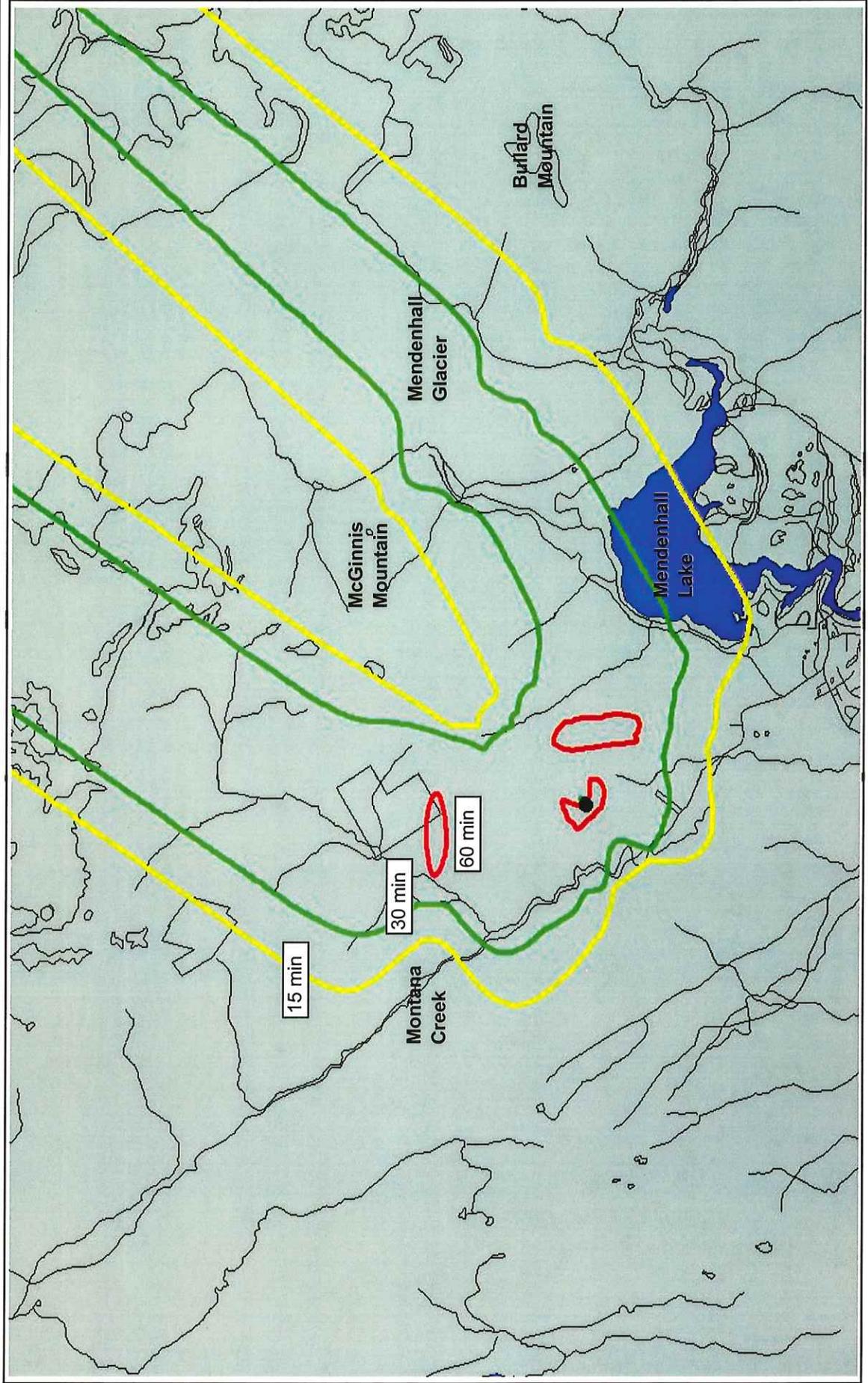
Flightsseeing Noise Assessment -- City and Borough of Juneau

DNL Noise Contours -- 45 50 55 60 DNL



Appendix A - 6

Time Above 55 Noise Contours for Montana Creek Site
Flightseeing Noise Assessment -- City and Borough of Juneau
TA55 Noise Contours -- 15 30 60 Minutes per day



Appendix B - Quiet Technology

Helicopter Quiet Technology

Helicopter manufacturers are developing new helicopter technology that generates lower noise emission levels. These new technologies address methods to reduce the tail rotor noise levels. Eurocopter currently offers two helicopters with lower noise emissions.

EC 130 B4

The EC 130 B4 single engine helicopter is the new 7-8 seat Eurocopter product. External noise emissions are 8.5 dBA lower than the maximum level authorized by the ICAO. This is achieved by the low noise "Fenestron" and the automatic control of the rotor RPM, a function which automatically optimizes the overflight noise signature without operational limitations.



EC 135 P1/T1



The EC 135 P1/T1 twin engine helicopter is capable of carrying 1 pilot and 6/7 passengers. External noise emissions are 7dBA lower than the maximum level authorized by the ICAO. Newest technology is applied such as a bearing-less main rotor (BMR), high performance main rotor blades and low noise ducted tail rotor (Fenestron).

These helicopters are estimated to be about 5 dBA quieter than the current Aerostars that are used by all of the major tour operators in Juneau. For example, if a site is currently exposed to an average maximum noise level of 60 dBA with the current technology, it would be about 55 dBA with the new technology. The 5 dBA improvement in single event noise level would also result in a reduction in other metrics as well, including the time above level and the DNL noise level. The audible duration of each event would be expected to be reduced by about 30%. The DNL noise level attributable to helicopter operations would also be about 5 dBA less.

This reduction would make a noticeable difference, but far less than the elimination of noise that would occur for most areas of Juneau with alternate heliports.

Flightseeing Aircraft

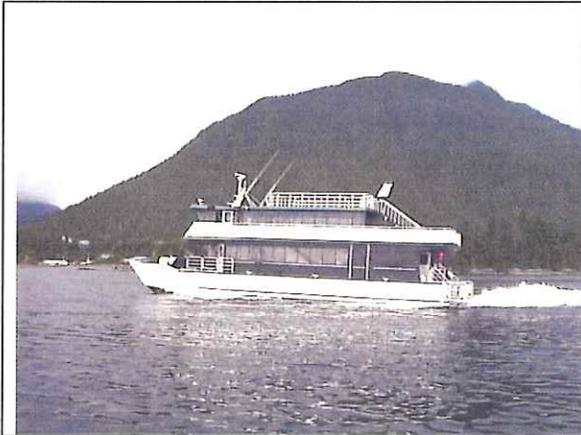
New, quieter technology for floatplanes was also evaluated. In general, the new Caravan turbo prop floatplane is estimated to be about 5 to 7 dBA quieter overall than the current fleet of Otters and Beavers. This reduction in noise is primarily associated with departure noise, which is the major source from these aircraft.

On August 23rd we measured the Caravan against Otters and Beavers. All the planes took off from the Juneau Harbor and flew the same path down the channel. The measurements showed that the Caravan was 7 dBA quieter than the Otters and Beavers when it followed normal flight procedures. When the Caravan followed a noise abatement flight path (lower climb rate, similar to the existing Otter climb rate), the noise levels were 11 dBA quieter than the current technology. The Caravan also has a more broad based noise spectra that is less annoying than the pure tones associated with the Otters and Beavers. At the Sandy Beach monitoring site, the Otters and Beavers averaged 73 dBA. The Caravan, without noise abatement, was 66 dBA. With noise abatement, the noise level was 62 dBA.

Appendix C – Marine Transportation

Subchapter T vessels, which are licensed to carry up to 150 passengers, are manufactured by Allen Marine in Sitka and several other shipyards in the Northwest. Allen currently manufactures 50 passenger, 100 passenger, and 150 passenger fast ferries that might be suitable. Information on each of these size boats is included below. Standard buses serving the heliports have capacities of approximately 50 passengers. The operating costs of these craft can be very competitive if they run with close to full loads; as the volume of passengers goes up, the benefits of vessel use, both economically and in reducing land traffic impacts increase. Vessels, as discussed under the Dupont site discussion and in Appendix D, could be used to transfer passengers directly from the cruise ships or docks to the Dupont site for both helicopter and floatplane tours.

78-Foot Excursion Catamaran M/V St. Nicholas



Allen Marine Vessel Specifications:

Coast Guard Licensed For: 150 Passengers and crew of 6

Length: 78' Overall

Breadth: 28'

Gross Tons: 89

Loaded Draft: 2 ½'

Speed: 28 – 32 Knots

Fuel Capacity: 1200 Gallons/Tank (2 tanks)

Fuel Consumption: 110 Gallons/Hour

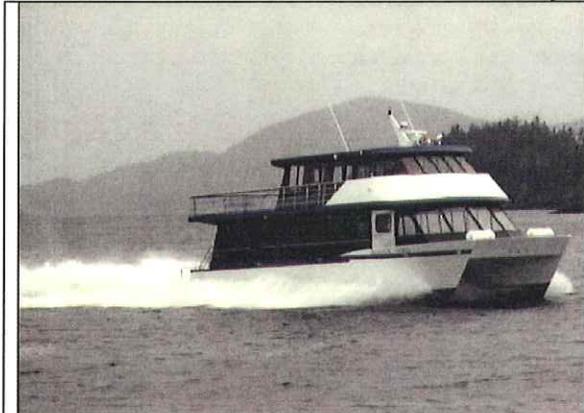
Propulsion: (4) 6140 Luger 600 hp Diesels

(4) Hamilton 362 Waterjets

The upper deck offers a large exterior viewing platform aft of an enclosed cabin with seating for 40 passengers. The main deck cabin provides seating for 110 additional passengers.

Port and starboard doors lead from the front of the main cabin to the forward deck where loading and off-loading of passengers while alongside cruise ships generally takes place. Steering and engine controls located on each bridge wing make for enhanced alongside maneuvering capabilities.

65-Foot Excursion Catamaran M/V Majestic Fjord

	<p><u>Allen Marine Vessel Specifications</u> Coast Guard Licensed For: 100 Passengers and crew of 4 Length: 65' Breadth: 25' 6" Overall Gross Tons: 68 Loaded Draft: 2 ½' Speed: 29 – 33 Knots Fuel Capacity: 1100 Gallons Fuel Consumption: 110 Gallons/Hour Propulsion: (4) 6140 Lugger 600 hp Diesels (4) Hamilton 362 Waterjets</p>
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The upper deck has an exterior viewing platform and interior cabin with seating for 24 people just aft of the wheelhouse. The main deck cabin offers seating for an additional 78 people. Port and starboard doors offer loading and off-loading of passengers while alongside cruise ships. Steering and engine controls located on each bridge wing enhance alongside maneuvering capabilities.

64-Foot Mono-Hull “Otter Class” M/V Sea Otter Express

	<p><u>Allen Marine Vessel Specifications:</u> Coast Guard Licensed For: 49 Passengers and crew of 4 Length: 64' Overall Breadth: 13' Gross Tons: 27 Loaded Draft: 1 ½' Speed: 25 – 29 Knots Fuel Capacity: 250 Gallons/Tank (2 tanks) Fuel Consumption: 40 Gallons/Hour Propulsion: (2) 6140 Lugger 550 hp Diesels (2) Doen DJ-140 Waterjets</p>
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The large exterior upper deck provides wildlife viewing for passengers. Seating is available for 49 passengers in the main cabin. Two side doors in the main cabin are used to load and off-load passengers when alongside cruise ships. Vessel maneuverability allows true sideways motion, allowing confident docking in even the tightest spaces.

Appendix D Floatplane Relocation



In Juneau, flightseeing floatplanes are operated by Wings of Alaska, Inc. These floatplanes operate out of the Juneau Harbor, also known as the Juneau Seaplane Base. Noise impacts of floatplanes are loudest during takeoff, and floatplane noise impacts affect downtown, West Juneau, and Douglas as well as Thane and Lucky Me during the plane's flight up or down the channel.

Wings averages 45 to 50 takeoffs per day (most destined for Taku Lodge), with 70 to 75 on the busiest days, from the downtown waterfront. Each trip averages 50 minutes in length, including 10 minutes near residential areas (5 minutes out and 5 minutes back). Approximately 25,000 people per season take fixed-wing flightseeing tours in Juneau (Forest Service DEIS on Helicopter Landing Tours of the Juneau Icefield 2002 –2006). As part of this study, we briefly examined the effects of moving flightseeing floatplane operations.

Relocation to the Juneau Airport Floatplane Pond:

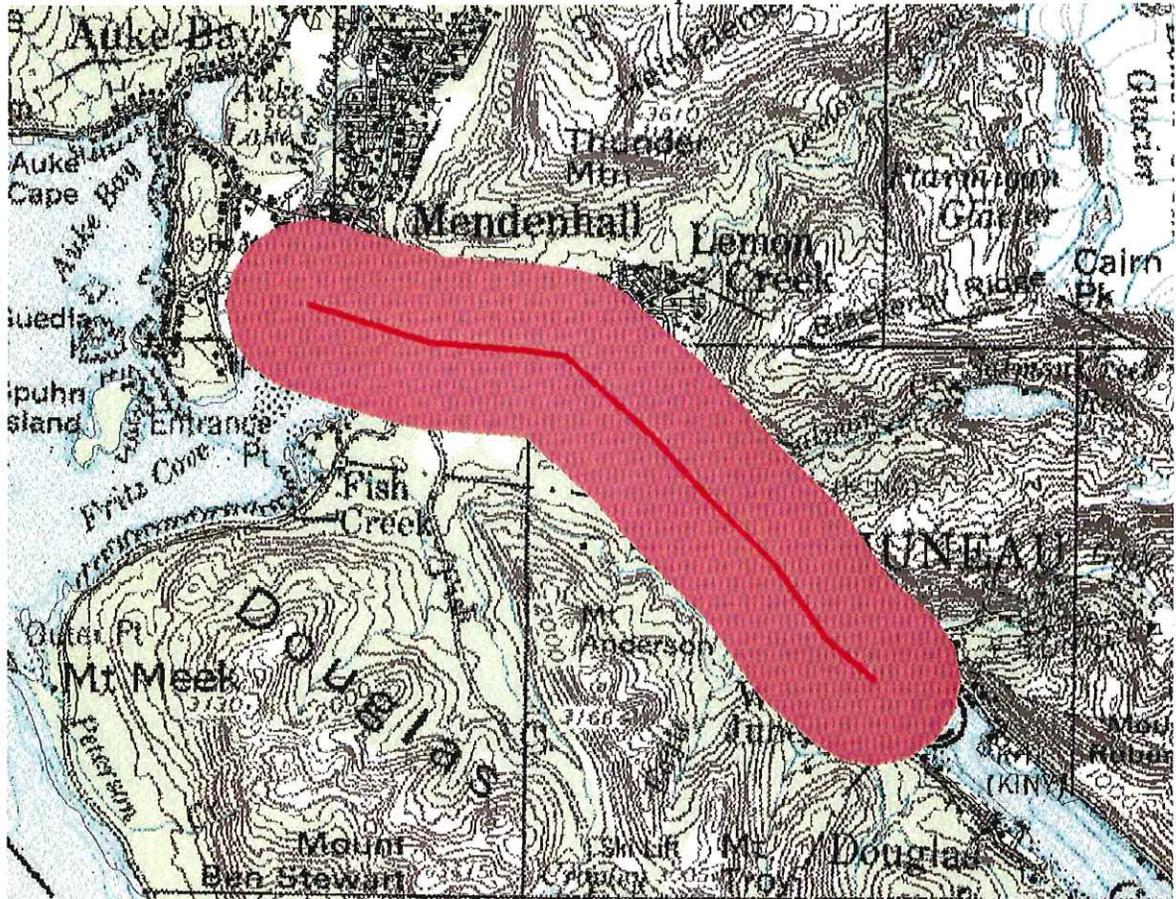
As an air traffic control issue, representatives of the FAA felt the staff at the Juneau Tower could handle the increased air traffic control load if all float plane operations were moved to the pond. Approximately 700 roundtrip bus trips would be needed between the Juneau Harbor and the airport per season to transport passengers, employee vehicles, vans, and miscellaneous vehicles such as fuel trucks. The airport manager feels there is room on the floatplane pond to handle the flightseeing floatplanes, but is very concerned about safety and security issues resulting from the additional bus and other vehicle traffic to the floatplane pond.

It is the hope of those advocating a move of all floatplanes to the Juneau airport that, after takeoff, the planes could fly above the Juneau ridgeline until they reach the south end of Thane Road. As a practical matter, weather conditions would eliminate this route between 25 and 50 percent of the time. It has been suggested that under low ceiling circumstances, the planes could fly around the backside of Douglas, following the island's west coast all the way around past Marmion. This, however, is a much longer, more expensive route and CBJ does not appear to have the legal authority to require its use. Far more likely, under bad weather circumstances is that planes would fly straight down Gastineau Channel from the airport.

Map C-1 shows the noise footprint for the portion of the flight path between the airport and the Douglas Bridge that would be added to the existing noise footprint. This noise footprint is shown at 10,000 feet (5,000 ft. per side) and believed to be conservative. As a point of reference, when measuring helicopter noise at the Mendenhall Glacier, the loudest noise at the Gladstone Street monitoring site was the sound of floatplanes taking off from the Juneau Airport Floatplane Pond. The pond is over a mile and a half away. Though noise impacts would be transferred to a smaller number of residences closer to the airport on good weather days, if flightseeing floatplanes took the Douglas ridgeline route, on any day they took the route down the channel, floatplanes taking off from the pond would add 4,920 additional homes to their noise footprint.

ADDITIONAL FLOAT PLANE IMPACTS FROM MOVING TO AIRPORT	1500 feet	3000 feet	5000 feet
AFFECTED PARCELS	355	1933	3464
AFFECTED UNITS	721	2272	4920

Additional Float Plane Noise Corridor from Airport



5000' Noise Corridors

Affected Land Parcels	3464
Affected Housing Units	4920

Relocation to Dupont:

If flightseeing relocation were to be pursued, a far more promising option would be to move the base of floatplane operations to Dupont in a co-location with the heliport. Procedures could be developed to incorporate the floatplane traffic for takeoff, landing and course reversal that would complement the other helicopter flight operations. (See the Gastineau Channel and Southern sites subsections of the Air Safety Section of this report). This would further reduce air traffic in the Gastineau Channel, and eliminate the potential conflict with paraglider activity. However, air traffic at the combined heliport/seaplane site could reach the level that would require full-time UNICOM advisory staff, or an air traffic control tower.

Co-location with the heliport could offer a number of advantages, delivering more benefit for the dollar for the cost of access and infrastructure.

Subchapter T vessels, as discussed under the Dupont site discussion and in Appendix C, could be used to transfer passengers directly from the cruise ships or docks to the Dupont site for both helicopter and floatplane tours. As the volume of passengers goes up, the benefits of vessel use increase from an economic standpoint and in reducing land traffic impacts.

The change in noise impacts that would occur from moving both the southern heliport and flightseeing floatplane base to Dupont would be dramatic. The cabins at Lucky Me would experience an increase in noise impacts, and operations would be audible, though not loud, from the end of Thane Road. For the rest of Thane, Douglas, Downtown, West Juneau, North Douglas, and out Egan Drive towards the Valley, noise impacts from flightseeing would virtually go away.

Appendix E - Glossary

AIP – Airport Improvement Program, a grant-in-aid program administered by the Federal Aviation Administration for capital improvements to aviation facilities.

ANSI – American National Standards Institute

Approach Surface (i.e. 8:1) – The principal imaginary airspace plane defined under FAR Part 77, which is centered about the FATO and the approach/takeoff path, and identifies the objects that may affect navigable airspace. The approach surface for heliports has an upward slope of 8:1 (horizontal to vertical) and extends outward 4,000 feet.

ATCT – Air Traffic Control Center

Capstone – A Federal Aviation Administration (FAA) demonstration program in Alaska that uses Automatic Dependent Surveillance-Broadcast (ADS-B) technology to track and service traffic in the areas that have no radar coverage. Phase II of the program covering Southeast Alaska is expected to commence in 2002.

Decibel (dB)– A unit for expressing relative intensity of sounds on a scale from zero for the average unperceptible sound to about 130 for the average pain level. Increases in dB levels are expressed as a logarithmic progression. In human perception, a sound 10 dB higher than another sounds twice as loud, a sound 20 dB higher than another sounds four times as loud, etc. The most common weighted decibel scale is the A-weighted scale (**dBA**). This scale puts more emphasis on sound frequencies discernible by humans. This study and most community noise studies use the A-weighted decibel scale.

NOISE LEVELS IN DECIBELS

Noise Source	Decibel Level	Noise Effect
Busy urban street, diesel truck, food blender	90	Hearing damage (8 hrs)
Garbage disposal, dishwasher, average factory, freight train (15 M)	80	Possible Hearing damage
Freeway Traffic at 15 M, vacuum cleaner	70	Annoying
Conversation in restaurant, office, background music	60	
Quiet suburb, conversation at home	50	Quiet
Library	40	
Quiet rural area	30	
Whisper, rustling leaves	20	Very Quiet
Breathing	10	
	0	Threshold of hearing

DNL – day night noise level, The DNL is a 24 hour noise metric based on an A-weighted decibel to approximate the human ear. This is the measurement most commonly used by the FAA.

FAR – Federal Aviation Regulations

FATO – Final Approach and Takeoff Area, a defined area over which the final phase of the approach to a hover or landing is completed, and from which the takeoff is initiated.

Glidepath – A descent profile during a final approach

ICAO – International Civil Aviation Organization Airport, any airport designated by the Contracting State in whose territory it is situated as an airport of entry and departure for international air traffic, where the formalities incident to customs, immigration, public health, animal and plant quarantine and similar procedures are carried out.

IEC – International standards

IFR – Instrument Flight Rules

INM – Integrated Noise Model

L90 – The sound level that is exceeded 90 percent of the time. It is often used to describe background noise level.

Lmax – Maximum noise level

LOA – Local operators agreement

MSL – Mean Sea Level

NPIAS – National Plan of Integrated Airport Systems

RNP – Required Navigational Performance

SEL - Sound exposure level

Time Above – The total time during a day that noise levels exceed a certain level (for example, total minutes above 65 dBA).

TLOF – Touchdown and Liftoff Area, a paved area normally centered in the FATO, on which the helicopter lands or takes off. It is frequently called a “helipad”

UNICOM – A non-government communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOMs are shown on aeronautical charts and publications.

VFR – Visual Flight Rules

VMC – Visual Meteorological Conditions