

EXECUTIVE SUMMARY

FY21 FEMA REGION 10 CTP GRANT OPPORTUNITY

Project Background

Project Title: Landslide Resiliency Project for Haines, Alaska

Haines Borough (pop. 2,508) is located on the shores of the Lynn Canal between the Chilkoot and Chilkat rivers, 80 air miles northwest of Juneau, Alaska. It is just south of the Canada border at British Columbia and 600 air miles southeast of Anchorage, Alaska. Historically Chilkat territory, Haines is now predominantly a non-native community. There are two recognized tribal groups in the area, the Chilkoot in Haines and the Chilkat in Klukwan. Haines is a major trans-shipment point because of its ice-free, deep water port and dock and year-round road access to Canada and Interior Alaska. It is a northern terminus of the Alaska State Ferry System and a hub for transportation to and from southeast Alaska.

Project Area:
Please provide a brief geographic description (e.g. watershed, county, tribe, or community name) along with a map graphic if possible.



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<p>Summarize the Project Description:</p>	<p>The Alaska Division of Geological & Geophysical Surveys (DGGs) proposes to conduct landslide mapping and slope analysis for community-selected areas of the Haines Borough, Alaska. Landslides are dangerous natural hazards that occur in mountainous areas and regions of unstable slopes throughout Alaska and can be exacerbated by prolonged and intense rainfall and by significant earthquake shaking. This project will process and utilize lidar data collected by DGGs in spring 2021 (collection costs paid by DGGs), in combination with geospatial analysis and existing data, to produce an up-to-date assessment of landslide characteristics and susceptibility in and around Haines. The shallow-landslide susceptibility mapping protocol we use combines an inventory of existing landslides with zones of concern derived from a Factor of Safety (FOS) map and buffers.</p> <p>Key elements of this project include:</p> <ul style="list-style-type: none">• Process high-resolution lidar elevation data.• Map and catalog historic and prehistoric landslides, including slides stemming from the December 2020 Southeast Storms disaster event. Mapping will be conducted throughout the Haines Borough in areas designated by the Borough.• Compile existing data and perform gap analysis for more detailed geologic and hazard mapping, monitoring, warning, and reporting.• Characterize landslide types and key distinguishing features.• Identify general areas of increased susceptibility and present options for further study or consideration before development.• Work with the Borough to improve public understanding of general landslide hazards, ongoing studies, and potential mitigation measures.
<p>Summarize the anticipated Project Outcomes, Benefits, and Mitigation Opportunities:</p>	<p>The project will support landslide resilience by providing the data and education necessary for the City and Borough of Haines to guide development activity and structures to encourage safe and orderly growth that promotes the health and welfare of Haines residents. Information materials provided to the City and Borough of Haines will assist with public outreach efforts to educate residents and visitors on landslide safety. The study will be used as evidence for supporting future cost/benefit analysis required by FEMA for mitigation funding. Resultant GIS layers of landslide deposits and landslide susceptibility will be suitable data inputs for the multi-hazard RiskMAP analysis for Haines (currently entering Discovery phase), provide critical technical information for the next updates of the Haines Comprehensive Plan and Local Hazard Mitigation Plan, and guide upcoming borough land sales.</p>

Meeting the Needs (explain the following)

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Identify local advocacy for the proposed project and ability to advance mitigation action (define specific stakeholders and/or actions):	The Haines Borough is a "home rule" municipality with a manager form of government. The Borough Assembly is the sole lawmaking (legislative) body, creating and adopting all new borough laws and amendments or repealing laws and amendments. The Haines Borough Assembly voted unanimously on February 9, 2021, to support this project. The Assembly directed the Borough Manager to write the attached letter of support.
Identify integration opportunities with Community or Tribal Hazard Mitigation Plan:	Haines is due to update its Local Hazard Mitigation Plan. Results and products of this study will be used to inform the Plan.
Is a Risk MAP project currently in-progress or planned in the study area? A Risk MAP project will entail new or updated flood mapping activity sponsored by the National Flood Insurance Program. Please see relevant attachments.	Haines is in pre-Discovery for developing a Risk MAP project. Results and products of this study will be used to inform the multi-hazard Plan.
How does this project support the National Investment Mitigation Strategy ?	This project collects and shares data that identifies risk posed by natural hazards (Investment Strategy Vision). This project makes funding for mitigation investment easier to access (Goal 2) by providing the documentation necessary to qualify for certain types of funding.
Relevant Experience	
Describe relevant experience working on FEMA or other Federal grants, including, but not limited to, technical experience, cost control, quality, and compliance with performance and reporting schedules.	DGGS has successfully completed two FEMA CTP projects (Sitka landslides and Emmonak channel changes), with a third (Homer landslides) being finalized this quarter and a fourth still in progress (Homer coastal bluff stability). We have successfully completed numerous other federal grant-funded projects, including from USGS, NSF, DOE, NOAA, and NASA, among others. We have completed all projects on time (with occasional approved no-cost extensions as needed) and on budget, and fulfilled all financial and work-progress reporting requirements. All output products are vetted for technical accuracy and quality by multiple layers of internal and external review prior to being released.
Project Planning	

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Estimated Project Cost:	Salary and benefits: \$80,673 Travel (site visits): \$4,000 Supplies: \$100 Federally negotiated indirect (18.03% on personnel costs only): \$14,545 Total: \$99,318
If FEMA has funding constraints, can this project be scaled or phased, and if so to what degree?	It is preferred that the project proceed as a single effort, but work can be divided into two phases if necessary. Lidar processing, data gap analysis, and preliminary targeted landslide characterization could proceed as one phase (est. cost: \$59,363), and systematic landslide mapping and slope analysis could be conducted as a second phase (est. cost: \$39,956). Outreach/education activities would be ongoing during both phases.
Estimated Project Period of Performance:	Two years: October 1, 2021, to September 30, 2023.
Project Staffing: <i>Include project role (e.g. project lead; lead engineer) and/or if this is going to be done in-house or contracted (e.g. Joe Smith, Project Lead, Agency; Field Survey to be Contracted)</i> Note: contractor support is not allowed for development of your submission or scope of work	<ul style="list-style-type: none">• Trent Hubbard, Geologist IV, DGGs Engineering Geology Section• Andrew Herbst, Lidar Technician, DGGs Engineering Geology Section• TBA, Geologist III, DGGs Engineering Geology Section• TBA, Graduate student intern, DGGs Engineering Geology Section• Michael Hendricks, GIS Manager, DGGs Geologic Information Center• Simone Montayne, Metadata Specialist, DGGs Geologic Information Center• Kristen Hendricks, Publications Specialist, DGGs Geologic Information Center• Patricia Ekberg, GIS Analyst/Cartographer, DGGs Geologic Information Center
Executive Summary Deliverable	

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Projected Major Deliverables:
If the project can be scaled or phased, itemize the deliverables applicable for each scope of work

Phase 1

High-resolution lidar:

- 1) Lidar elevation data for the Haines area of interest, available for free public viewing and download on the DGGs interactive web map "Alaska Elevation Portal" at <http://elevation.alaska.gov/>

Landslide inventory and gap analysis:

- 1) Preliminary map and catalog of historic and prehistoric landslides, including characterization of landslide types and key distinguishing features.
- 2) Gap analysis for more detailed geologic and hazard mapping, monitoring, warning, and reporting.

Phase 2

Landslide mapping and slope assessment:

- 1) Maps depicting landslides and slope characteristics in the Haines area of interest. This activity will include the final inventory map of existing landslides (historic and prehistoric) and a map with areas of high, medium, and low landslide susceptibility. Specific areas included for each type of mapping may vary according to community requirements.
- 2) GIS data layers of landslides and slope characteristics, suitable for use by RiskMAP and for the City and Borough of Haines to use in their own GIS for updating zoning and development policies.
- 3) Summary technical report, including final analysis and interpretations.

Phases 1 and 2

Public outreach on landslides and landslide safety:

- 1) Public meetings and educational sessions, online and/or in-person (if possible).
- 2) Regular briefings to Haines Borough Assembly or designee(s).

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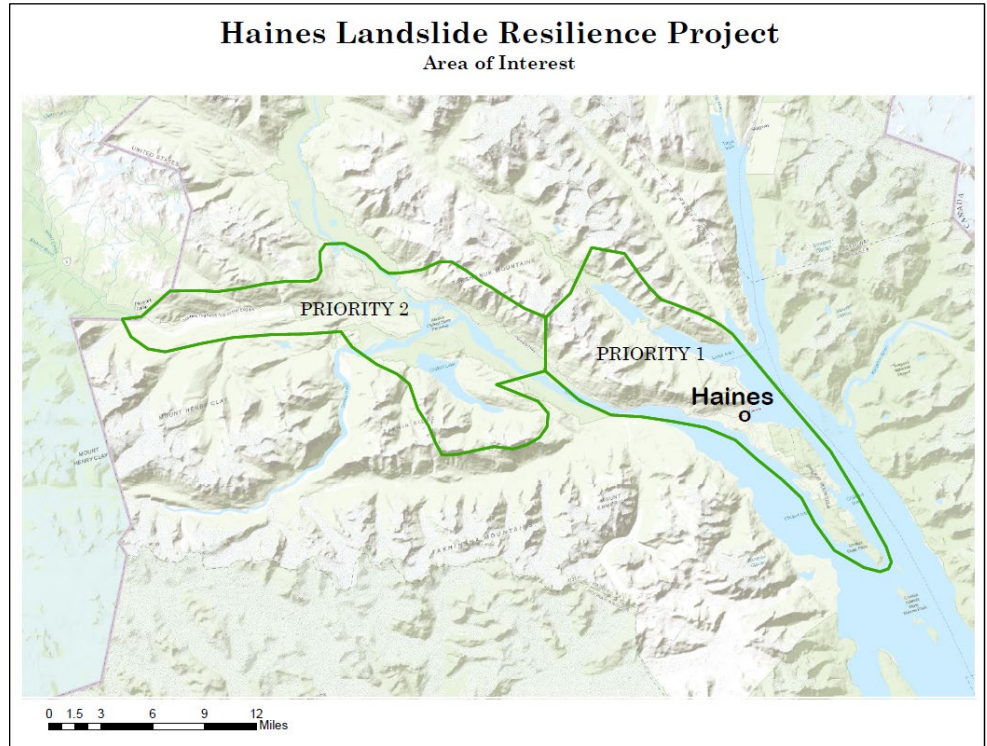
(See attached KMZ)

Eastern polygon is Haines' **Priority 1** area of interest and the primary focus of this project.

If DGGs can opportunistically expand its spring 2021 lidar collection to a larger area, the western polygon is Haines' **Priority 2** area of interest.

If possible, please include an attachment of the project location in a GIS-ready format (e.g. SHP, KMZ).

Project location can be defined by area (e.g. study boundary), linear extent (e.g. stream reach), or point (e.g. localized study).





HAINES BOROUGH, ALASKA

P.O. BOX 1209

HAINES, AK 99827

(907) 766-6400 * FAX (907) 766-2716

February 10, 2021

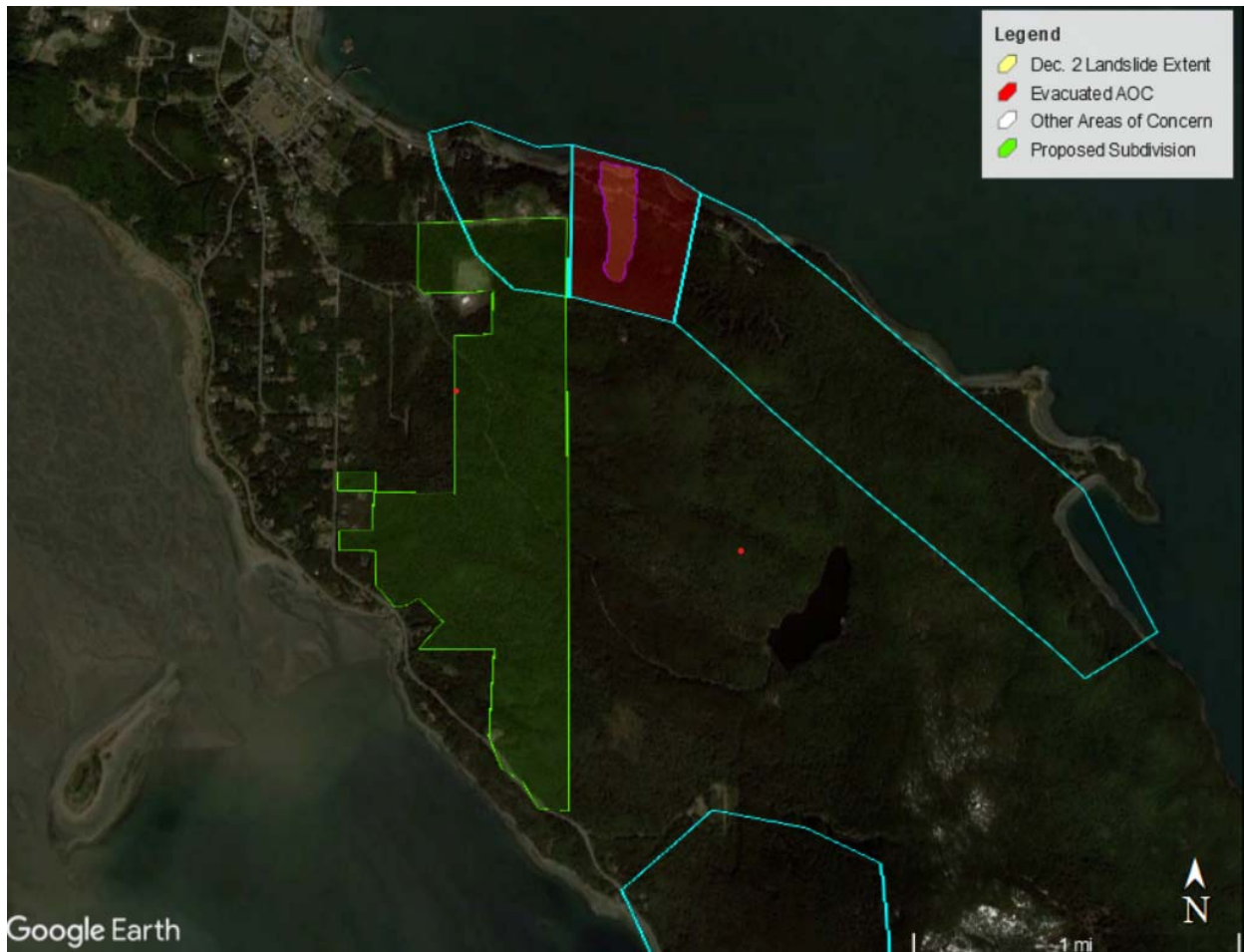
De Anne S.P. Stevens
Chief, Engineering Geology Section
Division of Geological & Geophysical Surveys
Alaska Department of Natural Resources
3354 College Road
Fairbanks, AK 99709

In re Haines Borough Support for CTP Grant

De Anne-

Thank you so much for this opportunity. At last night's Borough Assembly meeting, the Haines Borough Assembly unanimously directed me to support the CTP Grant since we have several unmet needs in the Haines Borough with respect Hazard Mitigation in light of the recent landslide.

In June of 2020, the Haines Borough Assembly authorized the selling of borough land to increase our permanent fund to help make us more self-sufficient with respect to our ongoing budget issues. The land identified for sale and development of a residential subdivision is in the Mt. Riley Rural Mixed zone. We identified that in areas "Where public water or sewer utilities are unavailable, the size, slope, dimension and soil type of subdivision lots must be adequate to support on-site water and wastewater systems to properly serve the planned use of the property". We anticipate both residential lots and recreation areas in this development. This proposed area is just above the slide area and is comprised of approximately 400 acres owned by the Haines Borough. The proposed CTP Grant will provide crucial information to manage the risk and increase the resilience to potential landslides. As we make land sale decisions, we need help to orient lots and inform decisions with respect to setbacks, recreation areas, greenspaces, zoning, etc.



In addition to specific and immediate information with respect to the proposed housing development discussed above, our Hazard Mitigation Plan (2010) and Comprehensive Plan (2012) are outdated and must be brought current. We simply have not had the funding to support the updating of these plans.

We need help. We live in a geologically dynamic area. This has been brought to the forefront of our consciousness since our recent landslide tragedy which took the lives of two residents, destroyed homes and upended infrastructure.

Thank you for your consideration.

Alekka Fullerton
Haines Borough Interim Manager

cc: Mayor Olerud
Haines Borough Assembly

From: [Alekka Fullerton](#)
To: [Stevens, Deanne S P \(DNR\)](#); [Carolann Wooton](#); [Liz Cornejo](#)
Cc: margaret.darrow@alaska.edu; [Hubbard, Trent D \(DNR\)](#)
Subject: RE: Haines landslide mapping CTP - area of interest
Date: Friday, February 12, 2021 11:30:36 AM
Attachments: [2020 Potential Development Areas.pdf](#)

Hi De Anne-

I think it looks good. We will take everything we can get. FYI- there are several other areas owned by the Haines Borough with development potential- they are all in your proposed area but here is a close up of those areas.

Thank you for all of your efforts!

Alekka Fullerton

Interim Manager/Borough Clerk
Haines Borough
P.O. Box 1209
Haines, AK 99827
(907)766-6402
fax (907)766-2716

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From: Stevens, Deanne S P (DNR) <deanne.stevens@alaska.gov>
Sent: Thursday, February 11, 2021 4:34 PM
To: Carolann Wooton <cwooton@haines.ak.us>; Alekka Fullerton <afullerton@haines.ak.us>; Liz Cornejo <liz@constantinemetals.com>
Cc: margaret.darrow@alaska.edu; Trent Hubbard <trent.hubbard@alaska.gov>
Subject: RE: Haines landslide mapping CTP - area of interest

EXTERNAL EMAIL: Do not open links or attachments unless you recognize the sender and know the content is safe.

Hi, all,

I am working my way through the budget, trying to maximize the area that we can evaluate with the amount of funding that is available through the CTP grant program. We're not going to be able to collect lidar over the entire area that I outlined in the map I sent yesterday, so I need to know what your priority areas are. I think we can scrape together enough money to do about half the area.

I have reattached the map here for easy reference, with a suggested revised area of interest. Note that the big blob has been divided into two sub-blobs. I propose that we prioritize the eastern blob for lidar acquisition and mapping, and will try to add as much of the western blob as we can if we are able to opportunistically pick up more area during the lidar flight.

It seems the highest priority areas are Lutak Road out to Lutak Spur, the main Haines community area, and the peninsula south of town where development is planned. The lake just north of Lutak Spur may pose a risk to the bridge if a landslide were to enter the water and create a "lake tsunami," so I have added it to the area of interest.

What do you think?

De Anne S.P. Stevens

Chief, Engineering Geology Section
Division of Geological & Geophysical Surveys
Alaska Department of Natural Resources
3354 College Road, Fairbanks, Alaska 99709
Tel: 907-451-5014 : Fax: 907-451-5050
Email: deanne.stevens@alaska.gov
Web: <https://dggs.alaska.gov/>

From: Stevens, Deanne S P (DNR)

Sent: Wednesday, February 10, 2021 12:03 PM

To: Carolann Wooton <cwooton@haines.ak.us>; Alekka Fullerton <afullerton@haines.ak.us>; Liz Cornejo <liz@constantinemetals.com>

Cc: margaret.darrow@alaska.edu; Hubbard, Trent D (DNR) <trent.hubbard@alaska.gov>

Subject: Haines landslide mapping CTP - area of interest

Carolann, Alekka, and Liz:

See attached first stab at defining an area of interest for the CTP mapping project. It's a fairly large area so if there are parts that can be shaved off (I was kind of winging it based on the discussion with Carolann this morning), please let me know. We have to make sure we capture everything up to the ridgetop above any locations we want to assess, since landslides can originate very high on the slopes. I have included the shapefile so you can make adjustments on it if you have the capability, otherwise just mark up the pdf and I can update the GIS layer

I may need to ask you to prioritize areas as we start working our way through the budget today and tomorrow. We may not be able to assess the entire area with CTP funding, but there may be other sources we can tap into if the DGGs landslide hazard program gets stood up this year.

Thanks,
De Anne

De Anne S.P. Stevens

Chief, Engineering Geology Section
Division of Geological & Geophysical Surveys
Alaska Department of Natural Resources
3354 College Road, Fairbanks, Alaska 99709
Tel: 907-451-5014 : Fax: 907-451-5050
Email: deanne.stevens@alaska.gov
Web: <https://dgggs.alaska.gov/>

From: Carolann Wooton <cwooton@haines.ak.us>
Sent: Wednesday, February 10, 2021 8:38 AM
To: Stevens, Deanne S P (DNR) <deanne.stevens@alaska.gov>; McDonald, Mitchell (DOT) <mitch.mcdonald@alaska.gov>
Cc: Alekka Fullerton <afullerton@haines.ak.us>; Liz Cornejo <liz@constantinemetals.com>
Subject: RE: Haines Event Summary

Thank you Deanne,

Just want to let you know that the Assembly supported the CTP Grant last night. Fingers crossed we have success.

I believe that Alekka will be working on a letter for you, is there anything else that you need from us?

Carolann Wooton

Contracts and Grant Administrator
Haines Borough
907-766-6409
907-314-2241 cell

From: Stevens, Deanne S P (DNR) [<mailto:deanne.stevens@alaska.gov>]
Sent: Tuesday, February 9, 2021 6:57 PM
To: Carolann Wooton <cwooton@haines.ak.us>; Mitch McDonald <mitch.mcdonald@alaska.gov>
Cc: Alekka Fullerton <afullerton@haines.ak.us>; Liz Cornejo <liz@constantinemetals.com>
Subject: RE: Haines Event Summary

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Good evening, all!

Attached please find the DGGs event summary. Let me know if you have any questions or need more info.

Cheers,
De Anne

De Anne S.P. Stevens

Chief, Engineering Geology Section
Division of Geological & Geophysical Surveys
Alaska Department of Natural Resources
3354 College Road, Fairbanks, Alaska 99709
Tel: 907-451-5014 : Fax: 907-451-5050
Email: deanne.stevens@alaska.gov
Web: <https://dggs.alaska.gov/>

From: Carolann Wooton <cwooton@haines.ak.us>
Sent: Monday, February 8, 2021 2:58 PM
To: Stevens, Deanne S P (DNR) <deanne.stevens@alaska.gov>; McDonald, Mitchell (DOT) <mitch.mcdonald@alaska.gov>
Cc: Alekka Fullerton <afullerton@haines.ak.us>; Liz Cornejo <liz@constantinemetals.com>
Subject: Haines Event Summary

Hi Deanne and Mitch,

The Haines Borough is very much interested in a formal compiled summary of the work that was accomplished during our slide and flood event.

Would you, DGGS and DOT, be willing to provide us with a short summary memo of the activities conducted during the event that can be included in our event documentation?

Thank you so much!

Carolann Wooton

Contracts and Grant Administrator
Haines Borough
907-766-6409
907-314-2241 cell

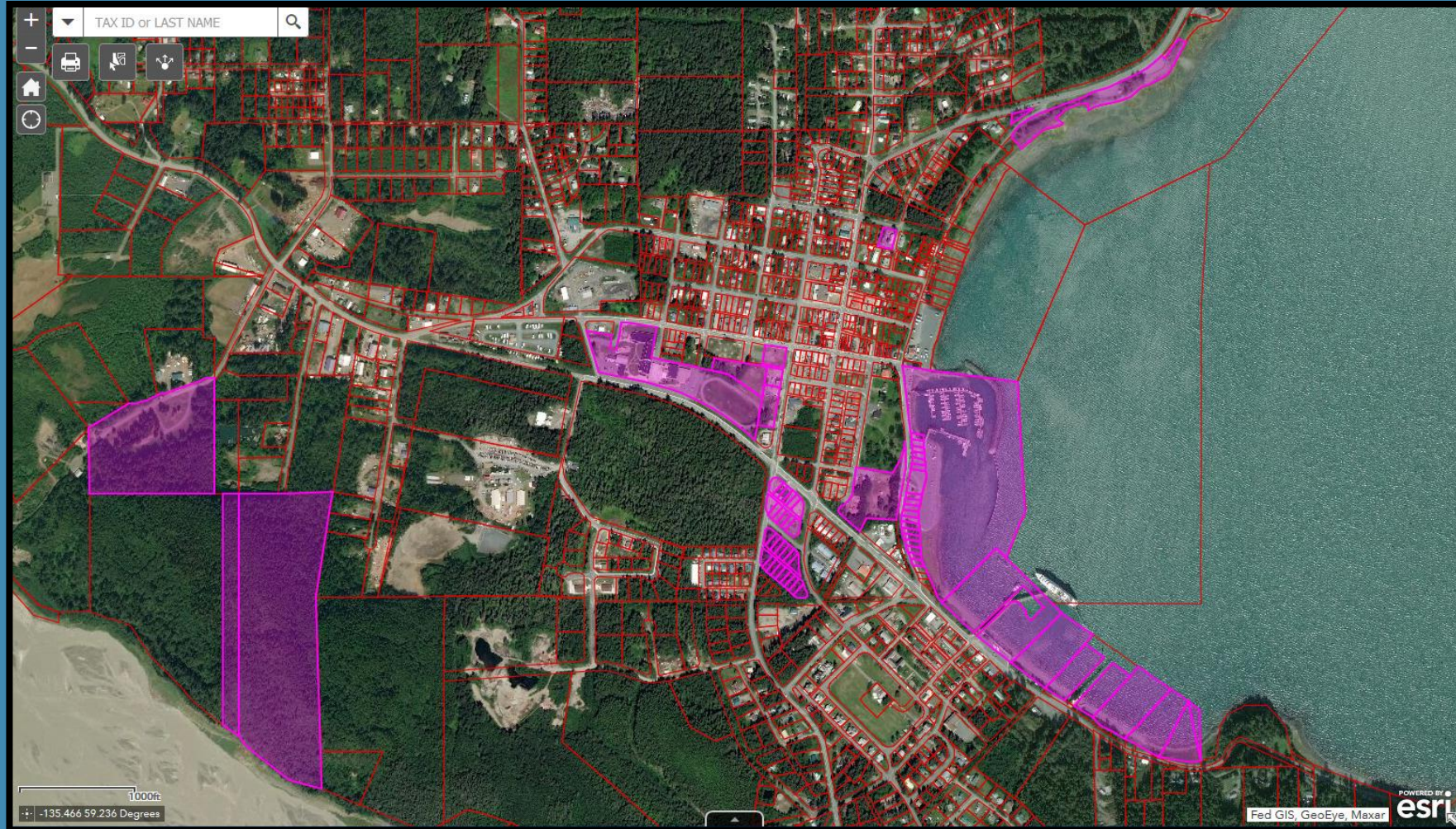
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TOWN-SITE



Vacant Lots behind Public Safety Building
C-MIS-0M-0100 through 0M-1600

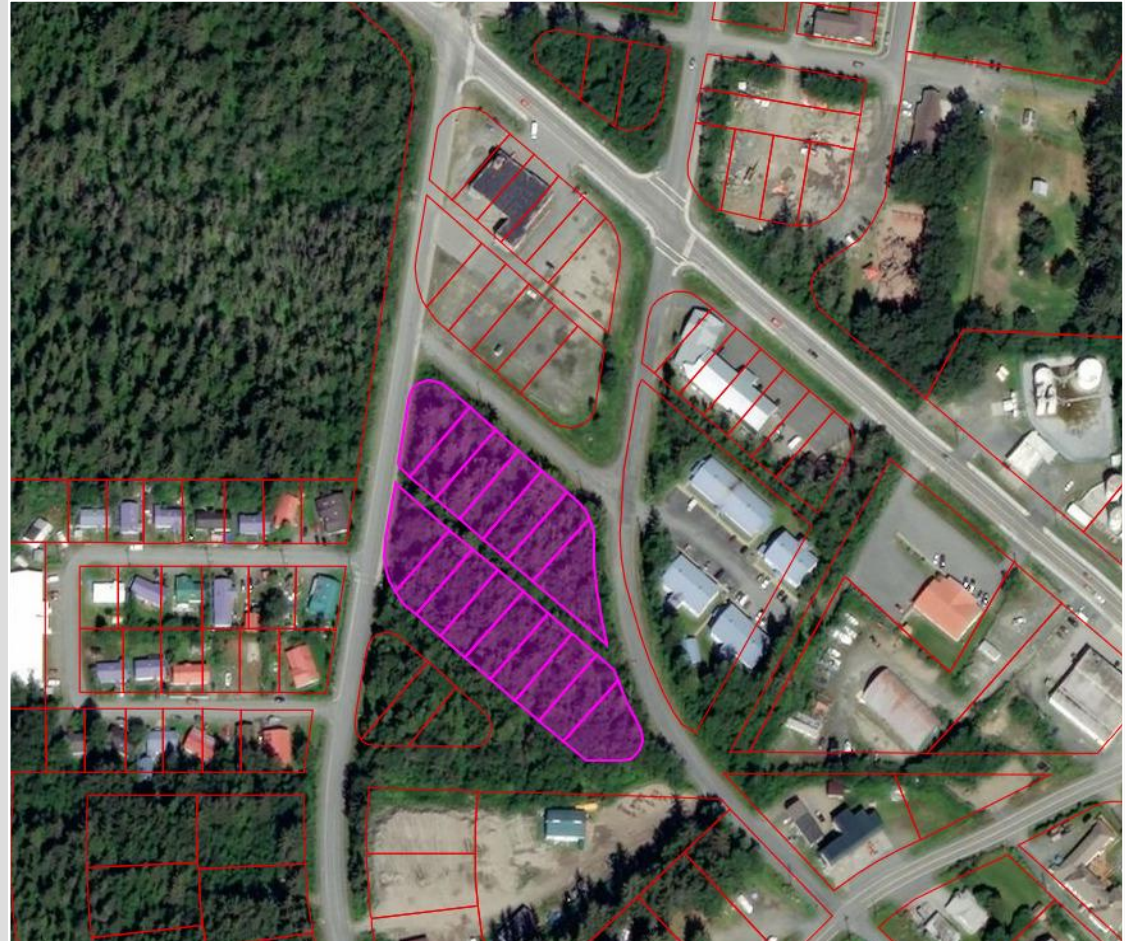
Pros

- Already subdivided into small lots

Cons

- Potential spot for Borough's new Public Safety Building

16 lots – Commercial

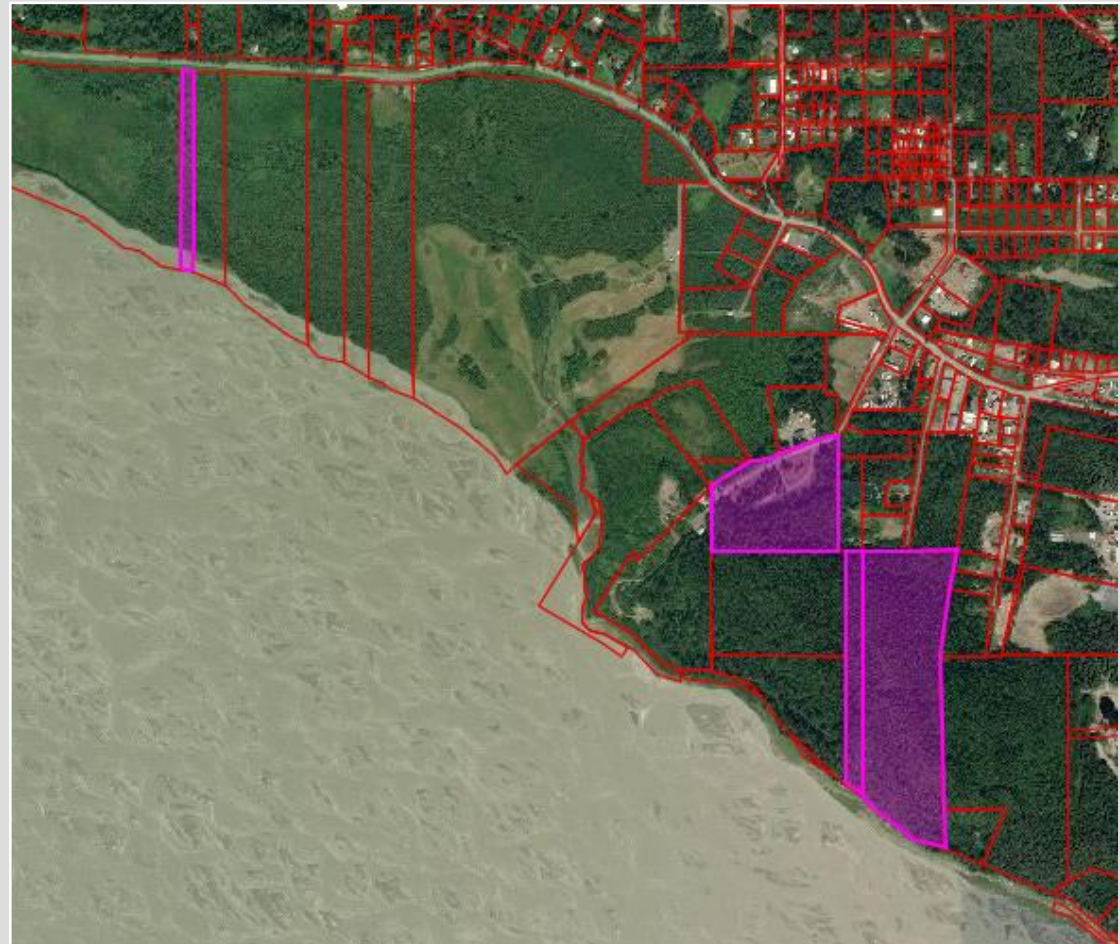


4 lots

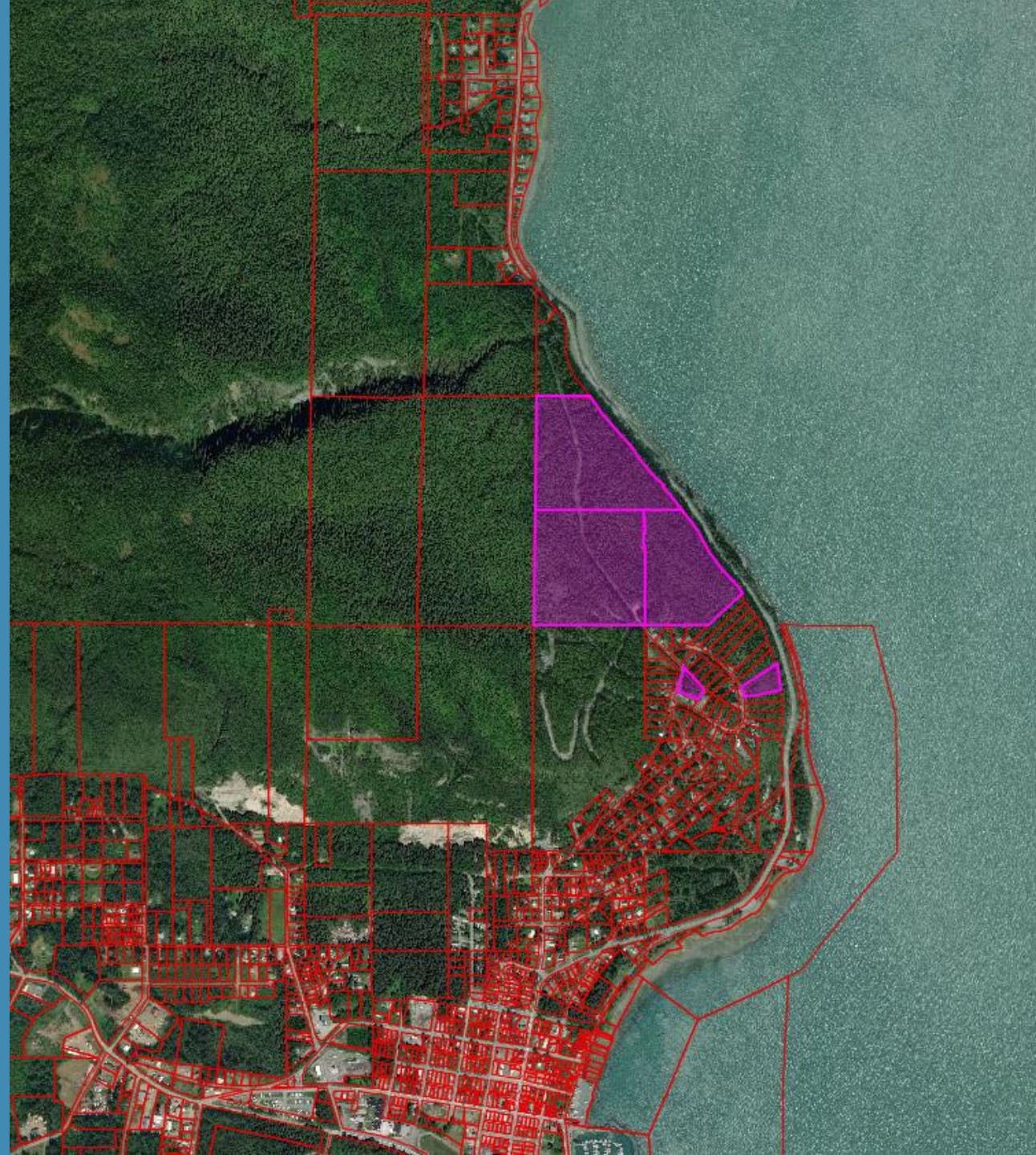
1. C-HHY-01-0650 *Rural Mixed Use*
I. 3.47
2. C-USS-00-1255 *Rural Mixed Use*
3. C-SEC-33-0200 *Rural Mixed Use*
I. 6.36 acres
4. C-SEC-34-0100 *Recreational*
I. 45.52 acres

Pros

Cons



SKYLINE



1. C-LTR-00-0300 *Rural Residential*
 - I. 41.23 acres
2. C-SEC-23-0100 *Rural Residential*
 - I. 40.00 acres
3. C-SEC-23-0300 *Rural Residential*
 - I. 33.80 acres
4. C-SKY-0B-I300 (Lookout Park) *Single Residential*
 - I. 2.28 acres
5. C-SKY-0C-I500 *Single Residential*
 - I. 1.4 acres

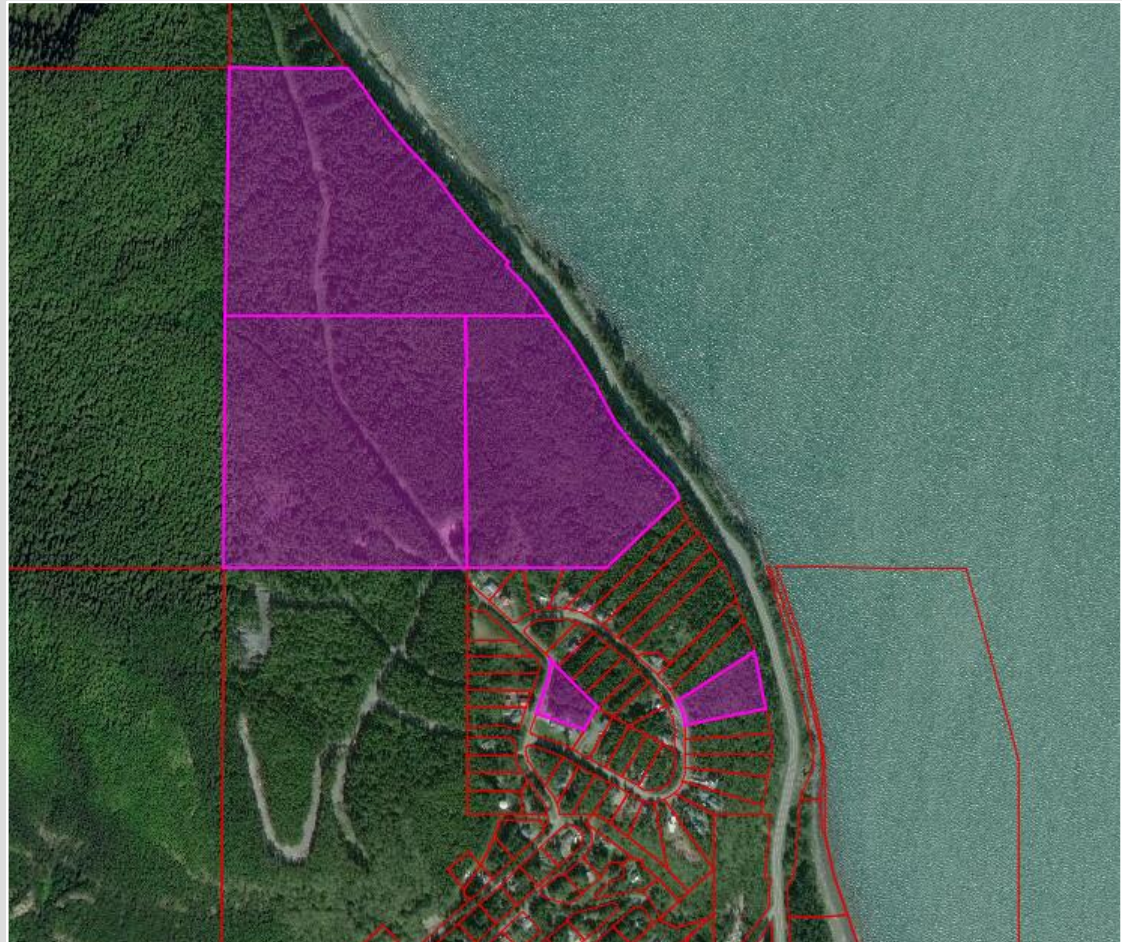
Pros

- Potential for subdividing residential lots.
- Old pipeline trail through properties

Cons

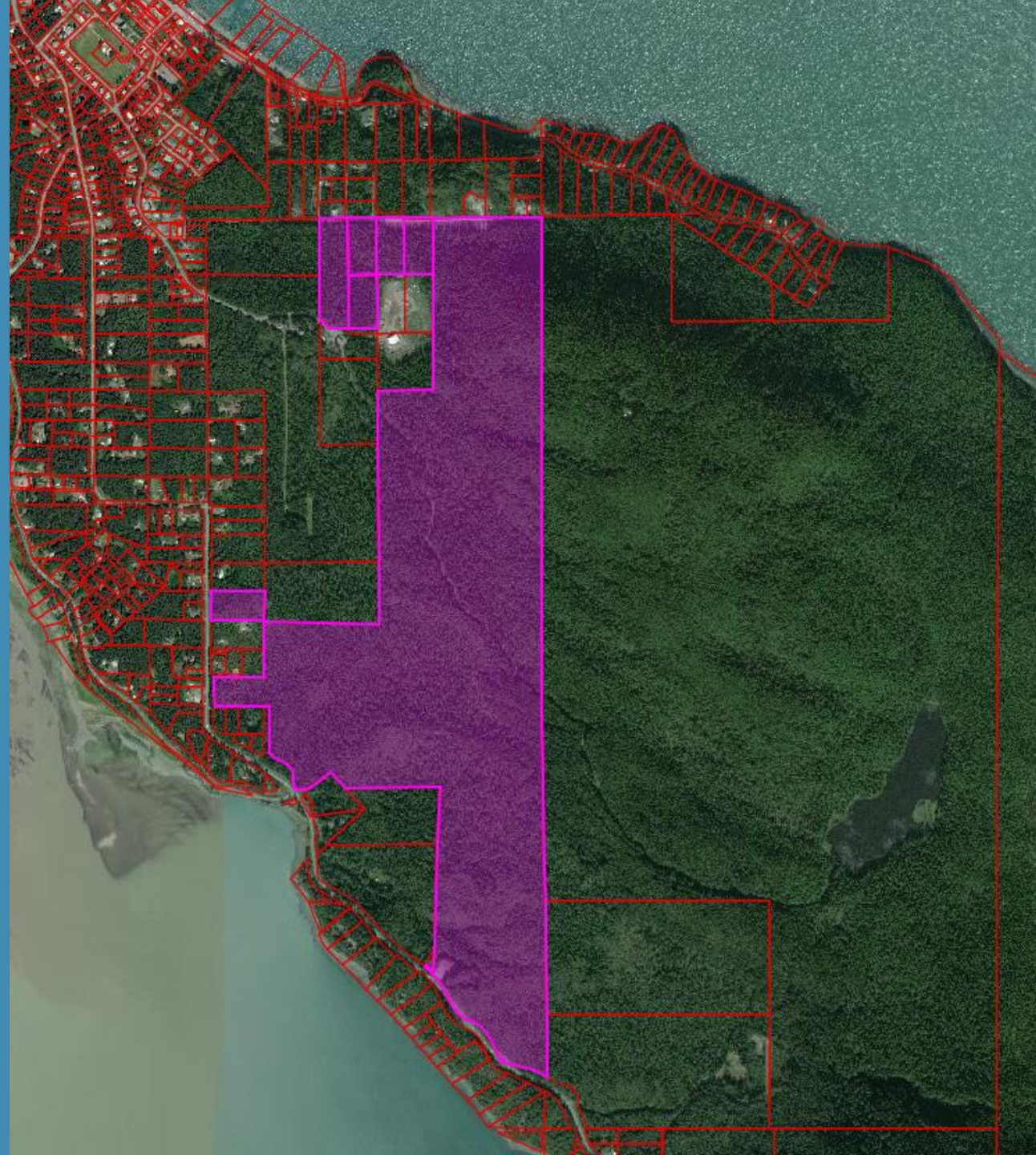
- Steep and exposed bed rock

5 lots



RILEY

Several 5 acre plats and a large lot nearing 400 acres.



7 lots- Rural Mixed Use

1. C-STR-02-0400
I. 5.07 acres
2. C-STR-02-0300
I. 5.02 acres
3. C-STR-02-0200
I. 5.03 acres
4. C-STR-02-1900
I. 5.00 acres
5. XXX
6. Tiny Lot
7. Big Lot
I. 398.7 acres

