Homer City Hall
491 E. Pioneer Avenue
Homer, Alaska 99603
www.cityofhomer-ak.gov

City of Homer
Agenda

City Council Worksession
Monday, January 10, 2022 at 4:00 PM
In person at City Hall Cowles Council Chambers via Zoom Webinar
Dial: (669) 900 6833 or (253) 215 8782 or Toll Free (888) 788 0099 or (877) 853 5247
Webinar ID: 965 8631 4135 Password: 792566

CALL TO ORDER, 4:00 P.M.

AGENDA APPROVAL (Only those matters on the noticed agenda may be considered, pursuant to City Council's Operating Manual, pg. 6)

DISCUSSION TOPIC(S)

a. Homer Green Stormwater Management System - Public Works Director Jan Keiser

COMMENTS OF THE AUDIENCE (3 minutes)

ADJOURNMENT NO LATER THAN 4:50 P.M.
Next Regular Meeting is Monday, January 24, 2022 at 6:00 p.m., Committee of the Whole at 5:00 p.m. All meetings scheduled to be held in the City Hall Cowles Council Chambers located at 491 E. Pioneer Avenue, Homer, Alaska.

HOMER GREEN STORMWATER MANAGEMENT SYSTEM

CITY OF HOMER PUBLIC WORKS DEPARTMENT

WATER, WATER EVERYWHERE

- History of drainage research
- What's missing?
- Drainage problems
- Concepts for Green Infrastructure Projects
- Next Steps

EARLY RESEARCH

- 1979 Drainage Management Plan (DMP)
- 1981- 82 Revised Drainage Management Plan
- Focused on traditional drainage management – stormwater, culverts & ditches
- Did not address groundwater, bluff erosion, water quality, etc.

"MODERN" RESEARCH

- 2003 – Wetland Functional Assessment Guidebook; ADEC
- 2004 – Soil Survey of Western Kenai Peninsula; USDA, NRCS and others
- 2007 – Homer Stormwater and Meltwater Management and Mitigation Handbook; Allegra Bukojemsky & David Scheer
- 2004-2009 Privately-funded work – Coble Geophysical Services, Mike McCarthy

MORE RESEARCH "RECENT" TIMES

- 2014 Beluga Area Planning Reference – Homer Soil & Water Cons. District
- 2020 Low Impact Dev. Planning – Kinney Engineering for City of Homer
- 2020 - Coastal Bluff Stability; AK Div. of Geological/Geophysical Surveys

WHAT'S BEEN MISSING?

- Connection between the research findings
- Implementation of the recommendations
- Consistent link with land development regulations
- Focus on water quality

WE STILL HAVE DRAINAGE PROBLEMS

- Drainage is damaging private property.
- Near-surface ground water is triggering bluff erosion.
- Drainage is threatening slope stability.
- Silt-laden storm water is flowing carried into streams.

FLOODING & EROSION

Photograph taken by Geoff Coble

USACE

Photograph taken by Chad W. Smith, U.S. Geological Survey

Public Domain

SHORT TERM SOLUTIONS CAUSE LONG TERM PROBLEMS.

- Private developments don't always look downstream.
- Inspection efforts don't address all development activity.
- Road/drainage maintenance focuses on efficiency, not sustainability.
- Water quality not always a priority.
- Windows of opportunity to use natural systems are closing.

BAYCREST SUBDIVISION

Eroded bluff materials deposited on beach

KACHEMAK DRIVE

Sediment laden storm water that outfalls directly to Kachemak Bay

KACHEMAK DRIVE

Homeowner revetment solution along beach

WHAT'S THE ANSWER?

- Acknowledge that nature always wins.
- Work with nature, not against it.
- Plan for the long term.

GREEN STORMWATER MANAGEMENT SYSTEM

- Includes four Green Infrastructure sub-systems
- Uses natural resources to diffuse water quantity and protect water quality
- Manages water flow to mitigate bluff erosion

WETLANDS

Peatland Pool

Riparian

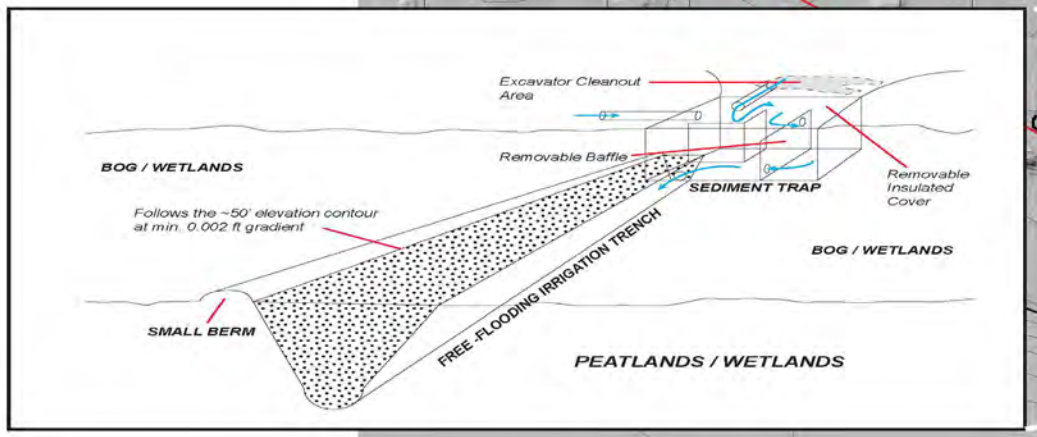
Relict Glacial Lakebed

Headwater Fen

GREEN INFRASTRUCTURE ELEMENT #1 – BISHOP'S BEACH STORMWATER TREATMENT SYSTEM

- Uses existing wetlands to store and treat storm water from Main Street and Old Town storm drains
- Diffuses water volumes flowing into Beluga Slough and Kachemak Bay
- Protects water quality of Beluga Slough and Kachemak Bay
- Ties into Bishop's Beach Park

Bishops Beach



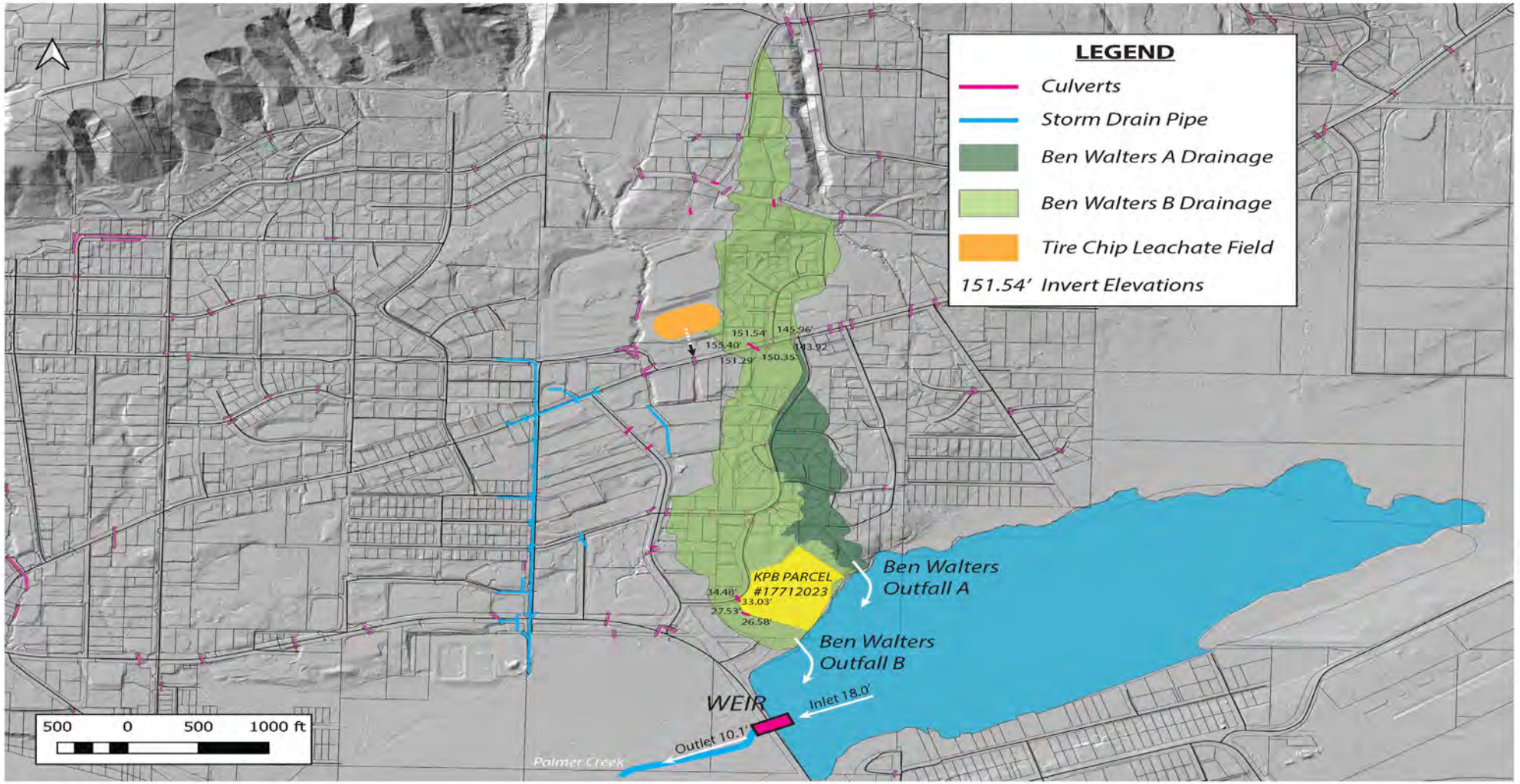
CLIENT	PROJECT	DRAWN BY	DESCRIPTION
City of Homer Homer Public Works Dept 3575 Heath St Homer, AK 99603	Bishops Beach Area Stormwater Treatment Project	CGS	Section C

FIGURE 7

GREEN INFRASTRUCTURE ELEMENT #2 – BEN WALTERS STORMWATER TREATMENT SYSTEM

- Uses existing wetlands to store and treat storm water from Ben Walter's Way and upstream watershed
- Diffuses water volumes flowing into Beluga Lake
- Protects water quality of Beluga Lake, Beluga Slough and Kachemak Bay
- Ties into Ben Walters Park

Ben Walters



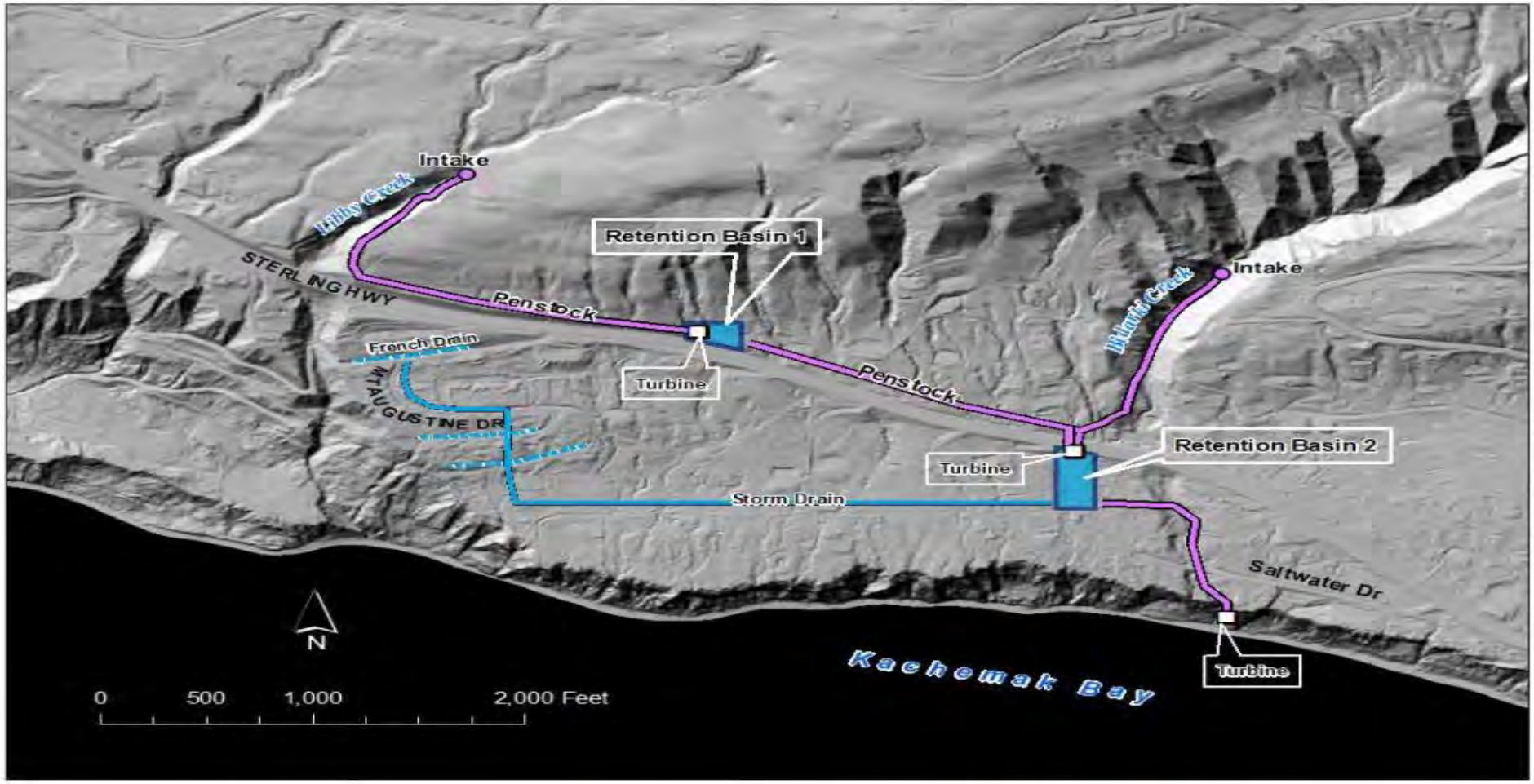
CLIENT	PROJECT	DRAWN BY	DESCRIPTION
City of Homer Homer Public Works Dept 3575 Heath St Homer, AK 99603	Ben Walters Area Stormwater Treatment Project	CGS	Ben Walters Outfalls

FIGURE 3

GREEN INFRASTRUCTURE ELEMENT #3 – BAYCREST AREA STORM DRAIN

- Carries drainage from Baycrest Hill area to Bidarki Creek
- Reduces potential for bluff erosion and slope instability
- Protects water quality of Kachemak Bay
- Provides opportunity for mini-hydro facility

Baycrest Storm Drain Plan



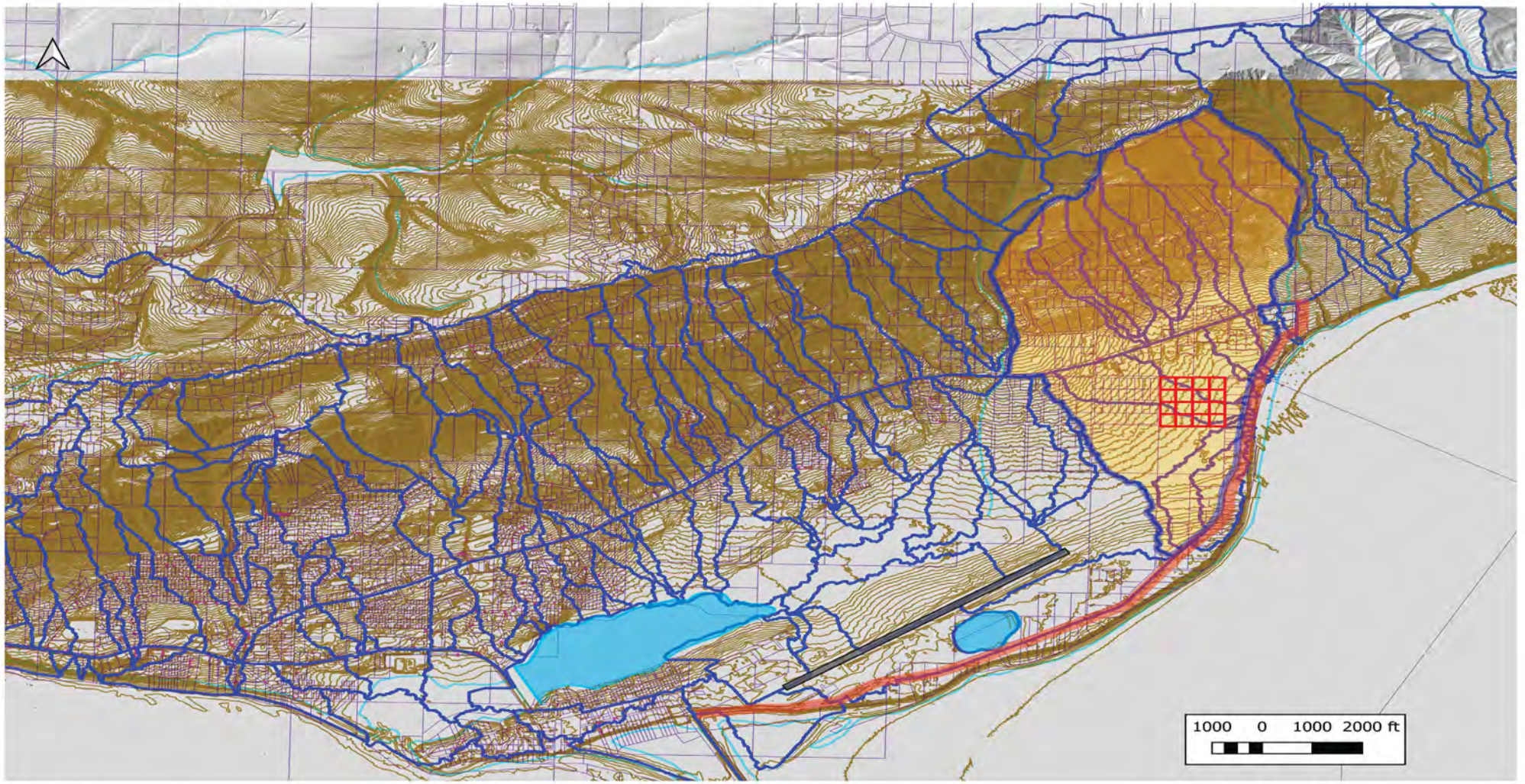
CLIENT	PROJECT	DRAWN BY	DESCRIPTION
City of Homer Homer Public Works Dept. 3575 Heath St Homer, AK 99603	Baycrest Stormwater Drainage Plan	CGS	Master Plan for Baycrest Area to Mitigate Sources of Bluff Erosion Via Storm Drainage Utilizing Water Retention and Power Generation

FIGURE 9

GREEN INFRASTRUCTURE ELEMENT #4 – CHECKERBOARD SPONGE

- Uses 50+ acres of existing wetlands to store and treat drainage from industrial/commercial land and upstream watersheds, including those in Kachemak City
- Reduces potential for bluff erosion on Kachemak Drive East
- Protects water quality of Kachemak Bay
- Provides opportunity for mini-hydro facility

Kachemak Dr.



CLIENT
City of Homer
Homer Public Works Dept
3575 Heath St
Homer, AK 99603

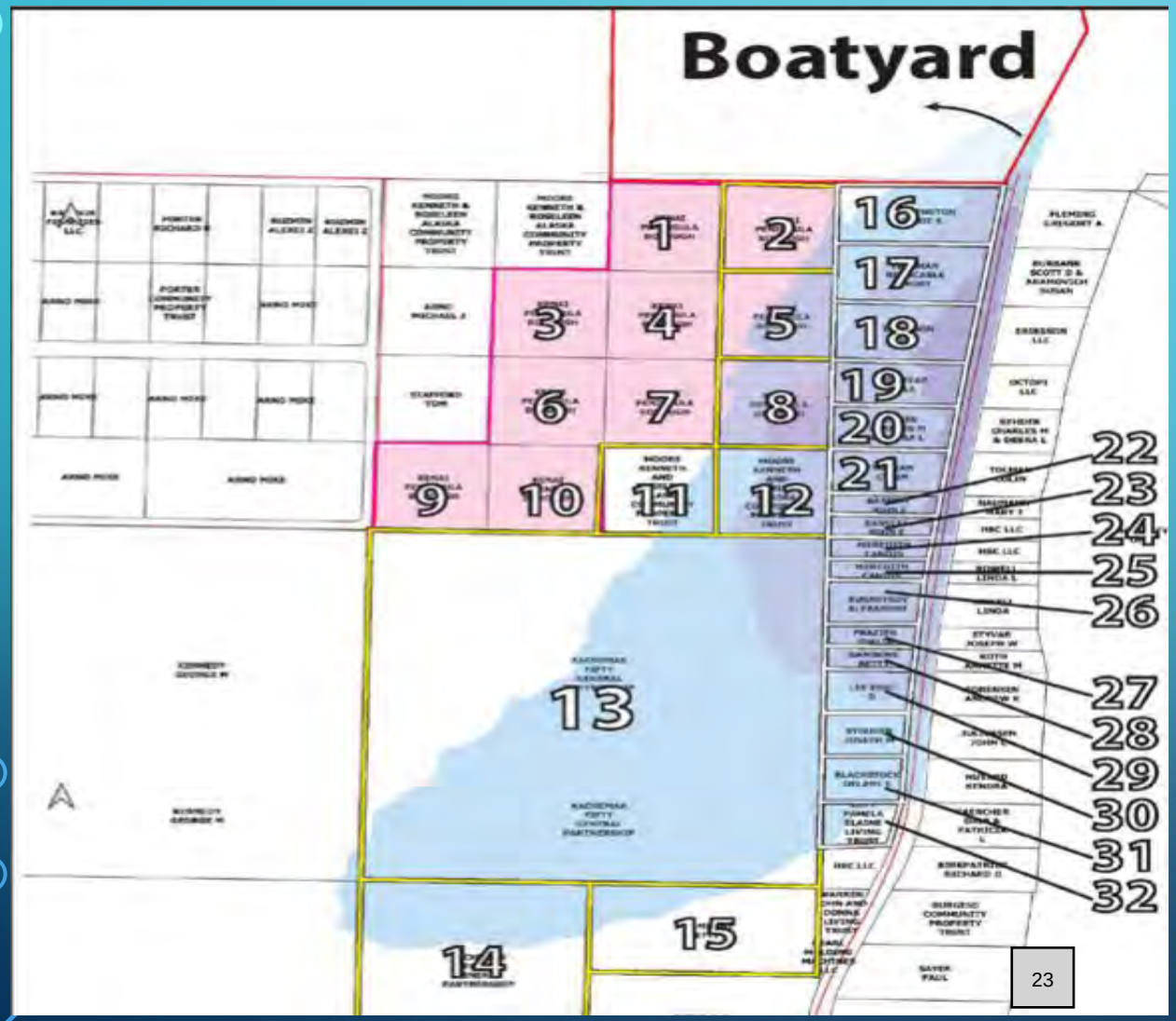
PROJECT
Kachemak Drive Stormwater Treatment and Control

DRAWN BY
CGS

DESCRIPTION
Storm Drainage, Basin Storage, Runoff and Coastal Erosion Mechanics, East Kachemak Drive

FIGURE
2

STORM WATER RETENTION AREA



Cool colors indicate low-lying wetlands that act as a retention area for large volumes of storm water

Credit: Coble Geophysical

NEXT STEPS

- Refine the concepts
- Secure the funding
- Acquire the real estate
- Design/build the projects
- Review/adjust regulations