

## Erie Lagoon Conversion Project Pre-Design Report

**Dated 11/02/2021**

### Project Information

Project number:

Town of Erie No.: P21-638

Topographic No.: 142112

Project title: Erie Wetlands

Location: 1000 Briggs St, Erie, CO

Client(s) information and contact details:

Client: Town of Erie	Prime Consultant: Topographic, Inc.
Name of project manager: Wendi Palmer	Name of project manager: Joseph Prinster
Town of Erie Office Address:  645 Holbrook Street PO Box 750, Erie, CO 80516	Principal Office Address: 1400 Everman Parkway Suite 146 Fort Worth, TX 76140  Local Office Address: 520 Stacy Court Unit B Lafayette, CO 80026
Email: WPalmer@ErieCo.gov	Email: Joseph.Prinster@Topographic.com
Telephone number: 303-926-2875	Telephone number: 303-551-8910

### Project Description

The Town of Erie owns two existing wastewater lagoons which are located on the north side of Old Town Erie near the old Wastewater Treatment Facility at 1000 Briggs Street. These lagoons have not been used since 1999, when the South Wastewater Treatment Facility was completed and came online. Then, in 2012 this south wastewater facility was closed when the new North Wastewater Reclamation Facility (NWRf) was completed. No records were found for any formal decommissioning of these lagoons.

The Town desires to repurpose these old lagoons as constructed wetlands to provide stormwater quality for the treatment of Old Town Erie's storm sewer system. A 54-inch storm sewer main from Old Town runs along the west side of the lagoons. By diverting the low flows into the converted lagoons, water quality treatment can be provided for existing and new development in Old Town Erie to remove trash and nutrients from storm water prior to discharging into Coal Creek.

The overall objective of this project is the design, permitting and preparation of contract documents for the conversion of former wastewater treatment lagoons to a constructed wetlands to treat stormwater from Old Town Erie.

The Town also desires to receive nutrient credits through the Colorado Department of Health and Environment (CDPHE) to be applied to the Town's North Water Reclamation Facility discharge permit.

In addition, the constructed wetland is intended to provide a wetland education opportunity for Erie, for the benefit of the general public.

### **Phased Objectives of the Project & Responsibilities**

The project is broken into 5 phases:

- 1) Pre-Design – This report summarizes the results of this phase.
- 2) Preliminary Design Services – This phase will commence upon approval of the Pre-Design findings.
- 3) Final Design Services
- 4) Bid Services
- 5) Construction Services

### **Concepts Considered**

Concept plans were developed for two approaches to constructed wetlands, based on how water flows through the wetland system. Option 1 is a linear, or continuous serpentine wetland layout, with some areas of deeper pools but generally having a single flow path. Option 2 is a cell structure wetland, containing separated deep pools connected by pipes and possibly shallow channels. Both options provide similar habitat for floral and fauna species; increased hydrologic functions, provide carbon sequestration and educational opportunities for the public. Please see Appendix A for diagrams of these two concept designs.

Option 1, Linear Wetland Design, has a continuous flow path from inlet to outlet. It would have lower construction costs and less complicated overall maintenance. Since it is a single flow channel, it is not possible to close parts of the wetlands for minor maintenance while still maintaining flow and function in the rest of the system. It is an “all or nothing” treatment system, either fully operating or completely closed. It is also harder to control the “preferential” flow time in a continuous wetland design. The flow will try to preferentially take the easiest route and may short circuit by cutting off part of the flow path. Short circuiting will lower the retention time within the pond, which will reduce and possibly minimize the beneficial impacts of the wetlands. This can be mitigated by careful grading design.

Option 2, Cell Wetland Design, has a number of connected deeper cells, each providing treatment while the water resides within. The cells are connected by pipes and small surface channels, each usually capable of being closed or opened separately through valve structures. This Option has a higher construction cost than Option 1. Ongoing maintenance would also be higher requiring personnel to open

and close gates as needed. However, this Option provides significantly more maintenance flexibility, particularly if part of the wetlands requires major work. Selected deep water cells could be isolated and taking one cell off line for maintenance as needed relatively easily, keeping the majority of the wetland in operation.

### **Public Engagement**

A series of public events were undertaken to inform and engage the public about the project, and to encourage public input. The two options shown in Appendix A served an additional purpose by illustrating alternative approaches to recreational and educational opportunities. Different path and access concepts were displayed, though either wetland design could utilize any of the recreational components.

The two design options were shared with the public during two “pop-up” events which were held during public community gatherings in September of this year. Public input was gathered during both events.

- Pop-up Event One was held September 9<sup>th</sup>, at the last Erie Farmer’s Market in Old Town Erie.
- Pop-up Event Two occurred on September 25<sup>th</sup> at the Tales & Ales event at Reliance Park.

The Design Team and Town of Erie representatives were on hand at both events, erecting a canopy and a number of display boards. These boards showed the two concept wetland designs, an existing aerial plan of the lagoon site, plus boards with possible features that could be located in the wetlands design, such as boardwalks, shade structures, kids’ play structures, etc. The Design Team had prepared a short survey to gather public input, as well as provided sticky dots for people to put next to features they were interested in.

After the first event, the Design Team, along with Wendi Palmer from the Town, met to discuss the feedback at the event, and to revise the presentation materials and updated survey in preparation for the second pop-up event. The revised information and survey were also posted on the Town’s Erie Engage website (<https://erieco.us/erie-wetlands>), with project information, images of the two design options, and an online version of the survey. The link was emailed out in the Town Administrator Weekly Update, shared to the Town social media sites, and was also sent to the local school boards. The online survey was open for public input for 2 weeks.

A public Open House at the Erie Recreation Center also was initially planned, however, due to the tightening of restrictions on indoor events, along the high level of responses at the two pop-up events, it was determined that an indoor Open House was not necessary.

The public was very responsive and interested in the project. A total of 145 survey responses were received. There were 51 survey responses submitted in person during the Farmer’s Market (Pop-Up Event One), and 43 responses submitted during the Tale & Ales (Pop-Up Event Two). In addition, 51 online survey responses were submitted during the two weeks it was open. All the online survey responses were anonymous.

The majority of the responses indicated a wish for soft trails (not concrete/asphalt), boardwalks over the wetlands, shade structures, natural climbing facilities for kids (rock amphitheater, wood/log steps, horizontal net out over the wetlands). Shade structures were highly recommended, not surprisingly since both pop-up events occurred on sunny days. Many responses expressed the wish for a natural area for self-guided exploration, with opportunity for observing wildlife. There was a strong preference for a full perimeter soft trail that ties into the boardwalks at various locations. A summary of the survey responses is provided in Appendix B. This input was used by the Design Team to modify and update the concept layouts in deriving the preferred concept.

### **Town Staff Engagement**

A Round Table meeting was held at the Erie Recreation Center on October 5<sup>th</sup>, attended by various departments of the Town of Erie, including Stormwater, Parks, Maintenance and Operations, and Engineering. The results of the public responses were presented. Feedback was given by the town departments regarding preferred design features and maintenance feasibility of the two design concepts.

Much of the staff input focused on ease of maintenance. Ensuring maintenance truck access feasibility by providing an 8-10' foot wide circumferential trail was requested. Providing access to the forebay by a larger truck (vac truck) was also requested. The forebay is critical for the long-term success of the wetlands by capturing and eliminating trash and excess sediment from the streamflow before it enters the wetland. Ease of maintenance also weighed strongly in favor of the linear wetland design. Staff felt the cell design would require excessive staff time to operate the gates between cells, and increased trimming to even be able to locate the small pipes as the vegetation grew out.

Staff also requested lighting around the perimeter – solar powered if necessary. Erie police have been having issues at the dog park next door due to low light, and the Town wants to forestall this issue here.

There were comments to have this be less of a playground, and more of a natural area – so no actual playground structures will be provided. Instead, recreational opportunities will focus on walking or running through the wetland. Bicycles will be restricted from the boardwalks and bike racks provided at the entrance. Passive educational activities and signage would be provided along the paths. Gathering areas will also be provided for small-group meet-ups.

### **Preferred Concept**

The design team weighed the results of the public responses and Town department input. The preferred design evolved out of this process, featuring the serpentine lineal wetland layout with a path layout that included elements of both initial concepts. Appendix C shows the Preferred Concept, including the updated amenity layouts.

Specific features that the Town requested that are included in the design are: maintenance-truck accessible fully encircling; a concrete forebay for ease of maintenance with pump truck access; lighting for safety; boardwalks for access over the wetlands; shade structures; an ADA path from the parking area

to the nearest shade structure. Some natural stone seating areas, plus a possible “net climb” for kids to explore over the top of the wetlands for educational purposes were features the Town liked.

Parking lot design was not originally included in the project, though it was apparent that improved parking will be important. It is being added by request of the Town, and a conceptual parking area is shown on the preferred design. The parking design accommodates the impending project to relocate the Town Recycling Center closer to the old treatment building. The area being vacated by the current recycling facility will be used for parking and bus turn-around. Other specific features of the parking which were requested by staff include: asphalt surface for maintenance ease, bus parking for school use, and a pedestrian connection to the sidewalk along Briggs St. Staff requested that as much parking be provided as is feasible within the given space.

As part of the process to develop the preferred concept, the Design Team recommended that the name of the proposed facility be revised to “Erie Wetlands”. The new facility will no longer have the lagoons, and a more suitable name seems appropriate. This new name was accepted by the Town Project Manager, and is being used on the Erie Engage website.

### **Jurisdictional and Administrative Tasks**

In addition to developing the preferred design concept, the Design Team has been pursuing several jurisdictional and administrative activities in preparation for project permitting. These activities fall into several categories: Lagoon Decommissioning; Wetland Delineation and 404 Permitting; Wetland Mitigation Banking; Water Augmentation Requirements; and Nutrient Removal Credits.

### **Lagoon Decommissioning**

The Design Team has been investigating whether the lagoons were formally decommissioned when the South WWTF was permitted in the late 1990s. Correspondence with CDPHE has occurred seeking to locate records that might indicate that the lagoons underwent any decommissioning process when the new CDPHE permit was approved. CDPHE responded to a record request with numerous documents regarding CDPHE permits CO0021831, CO0045926 and CO900835.

The aerated lagoon system appears to have been permitted under CO0021831. WWTF discharge permit CO0045926 was for the Erie South mechanical WWTF which operated from the late 1990s to around 2011. Permit CO900835 is the stormwater permit for the Erie South WWTF. None of the documents provided by CDPHE appear to provide any information either confirming or disproving that the lagoons were formally decommissioned.

Discussions were held with Tim Larson in the WQCD Permits Section at [tim.larson@state.co.us](mailto:tim.larson@state.co.us) (303-691-4091) regarding the requirements for formally decommissioning these lagoons as part of the current project. Mr. Larson provided a document titled “Information Regarding Domestic Wastewater Treatment Works Closure/Decommissioning,” March 2021, which summarizes the requirements for decommissioning wastewater treatment facilities, including these lagoons. It also references the specific

CDPHE regulations governing each requirement. This Closure/Decommissioning document can be found in Appendix G.

The first step in implementing this procedure is to determine if biosolids are present in the lagoons. This can be done visually, by excavating at several locations or along a trench or two with shovels or a backhoe. Someone who is familiar with biosolids would determine if there is an organic biosolids layer (darker material) present. The results of this activity must be well documented, with pictures taken throughout the process. Considering the age of the lagoons, there may be clay liner, and the trench or holes should be excavated at least to depth where this potential clay layer may be encountered.

If biosolids are not present, then send the pictures and a summary of actions and findings both Mr. Larson, and to Doug Camrud, ES Review Unit II Manager, at [douglas.camrud@state.co.us](mailto:douglas.camrud@state.co.us) (303-692-3271), and also log the results in the Town of Erie files for future reference.

If biosolids are present, then contact Mr. Larson with approximate estimates of volume present, and determine next steps of testing and disposal to an approved location. Disposal options include: landfill; use on a permitted land application site; A1 organics for composting. Any disposal site must be approved to accept biosolids, and each has its own testing requirements (including Regulation 64 if applied in a beneficial land use).

Additional procedures are described in the Closure/Decommissioning document for disposal of any liquids or solid waste which might be encountered.

Any solid materials material which is encountered, including any clay liner, must be properly managed in accordance with Regulations Pertaining to the Solid Waste Sites and Facilities 6 CCR 1007-2 (Solid Waste regulations) and the Solid Wastes Disposal Sites and Facilities Act, Title 30, Article 20, Part 1.

Liquids encountered must be disposed in accordance with the Colorado Water Quality Control Act, Section 25-8-501, and may require a permit for such discharges through CDPHE WQCD.

After any biosolids have been removed and managed, and solid waste materials and liquids have been managed in accordance the appropriate regulations, the Town must request termination of the CDPHE permit from CDPHE WQCD in accordance with the Colorado Discharge Permit System Regulations (Regulation 61). It is our understanding that permit CO0021831 would be the appropriate permit to terminate. This is being confirmed with CDPHE.

Geotechnical investigations will occur during a later phase of this project. Excavation and testing of the soils will occur to identify any remaining biosolids, in accordance with the specific requirements outlined in the Closure/Decommissioning document.



### **Wetland Delineation & 404 Permit Requirements**

Topographic Environmental performed an on-site assessment to determine the extent of aquatic resources within the former lagoons and is preparing an environmental delineation of the wetlands, along with a Delineation Report. The delineation map and a Technical Memo summary of this report can be found in Appendix D. Upon completion and approval by the Town, these will be submitted to the U.S. Army Corps of Engineers (USACE) for review and determination.

A consultation was held with the USACE regarding the jurisdictional nature of the former lagoons, as there is existing wetlands growth in evidence in both former lagoons. The delineation map and report will be submitted to USACE for an Approved Jurisdictional Determination. It is thought that the lagoons might be determined to be non-jurisdictional, but ultimately it will be up to USACE to determine this.

The 404 Permit process as also discussed with USACE. Regardless of the jurisdictional determination associated with the lagoons, USACE feels the project would be self-mitigating, replacing any existing wetlands with as much or more new wetlands. Since it is a beneficial project, 404 permitting should not be a major issue.

### **Wetland Mitigation Banking**

Another topic discussed with USACE was the possibility of utilizing the proposed wetlands created by this project as a wetland mitigation bank. It was determined this project size is small for a wetlands mitigation bank and does not warrant the cost of pursuing the wetland mitigation banking approval process.

Additionally, wetlands banking regulations include encumbrance under a conservation easement which places strict restrictions on the activities which can occur within banked wetlands. Maintenance activities are limited and controlled. Maintenance activities which might be undertaken by the Town to ensure the life and performance of the wetlands may not be allowed under the wetland banking regulations.

During the delineation site visit, it was noted that the stream banks along nearby Coal Creek are in a fairly advanced state of bank degradation. The Town owns both sides of Coal Creek along this reach. It is possible that a project to provide streambank improvements along the portion of Coal Creek which is owned by the Town might be of sufficient size to yield adequate mitigation banking potential. This is outside the scope of this project, but was also discussed with USACE, and might be undertaken in a future project.

### **Water Augmentation Requirements**

The design options show a potential 6" pipe leading from Coal Creek to the wetlands for the purpose of supplementing the wetlands during low rainflow times. The Design Team is currently working on the preliminary design for the wetlands. During this effort, a water budget analysis will be performed to

discern if supplemental hydrology would be necessary to maintain wetland vegetation during “dry months” or periods of drought, and to quantify the water rights that might be needed for this purpose.

Recently, Town staff made known to the Design Team that there is continuous, year-round flow through the existing 54 inch pipe which will enter the wetlands pond, and this flow is most likely from groundwater penetrating the pipe through loose joints or at broken portions. This flow has not yet been measured, though it is estimated to be about 24 gpm based on visual observations and initial calculations. It is possible that this may remove the necessity of supplementing from Coal Creek, which would remove the requirement additional water rights. This analysis requires the design to be farther developed to determine the volumes required by the vegetation, and the available supply provided by the continuous flow.

It is recommended that the continuous flow be measured, and monitored during the winter to confirm it is a year-round flow. It is also recommended that the Town confirm whether there are water rights implications in the use of this flow for this purpose.

### **Nutrient Removal Credits**

The Town wishes to investigate the feasibility of this project to receive nutrient credits through the Colorado Department of Health and Environment (CDPHE) to be applied to the Town’s North Water Reclamation Facility discharge permit. This program is known as Colorado Water Quality Control Commission’s Voluntary Incentive Program for Early Nutrient Reductions (Policy 17-1).

The Design Team held an initial consultation with CDPHE to determine the preliminary approach to be taken in quantifying nutrients and assessing removal in conformance with Policy 17-1. Using data from the New York State Stormwater Management Design Manual, preliminary results show that an estimated 44% of Total Phosphorus and 27% Total Nitrogen removal are achievable by treating the stormwater in this wetlands facility. This analysis is being extended and confirmed. A Technical Memorandum summarizing the nutrient removal analysis can be found in Appendix E.

### **Updated Survey of Lagoons**

A topographic survey of the existing lagoons has been prepared, to provide an accurate basis for the wetland design. The original survey area of scope included the existing lagoons from the outlet structure at the north, to the start of the existing parking area to the south, west to an existing berm near the property line, and east across Coal Creek. Additional surveying scope is under review for the proposed parking area and for pedestrian access from Briggs Street, however this extended survey is not available at this time.

The survey data also includes boundary location for a narrow triangular sliver of property along the west side of the existing lagoon site. Other than this triangular parcel, all of the land in and around the project site is owned by the Town. The boundaries of this triangular parcel property are being identified and will be staked prior to construction in order to avoid any encroachment or impacts to occur during the project. Please see Appendix F for the topographic survey.



## **Conclusions**

This Pre-Design Report for the Erie Lagoon Conversion Project (P21-638) describes the analysis and findings to date. Following extensive public engagements and input from Town Staff, a preferred concept for the constructed wetland pond had been developed and is shown in the appendix to this report. Jurisdictional requirements have been identified for wetland delineation and USACE permitting, water rights augmentation and nutrient removal credit analysis and are discussed in this report.

The project has generated public interest and will provide tangible benefits to the Town. We request that the project be approved to move to the Preliminary Design Phase.

## **Project Team**

### **Town of Erie Project Manager,**

Wendi Palmer, PE      Engineer III, Planning & Development Department      [WPalmer@ErieCo.gov](mailto:WPalmer@ErieCo.gov)

### **Consultant Team**

#### **Topographic Land Surveyors Co.,** Prime Consultant, Civil/Environmental Engineering & Surveying

Margaret Brown, PE	Branch Manager, Civil Lead	<a href="mailto:Margaret.Brown@topographic.com">Margaret.Brown@topographic.com</a>
Joseph Prinster, PE	Senior Project Manager	<a href="mailto:Joseph.Prinster@topographic.com">Joseph.Prinster@topographic.com</a>
Deborah Reuter, PE	Senior Project Engineer IV	<a href="mailto:Deborah.Reuter@topographic.com">Deborah.Reuter@topographic.com</a>
Jason Voight, PWS	Director of Environmental Services	<a href="mailto:Jason.Voight@topographic.com">Jason.Voight@topographic.com</a>
David Costner, PLS	Director of Rocky Mtn. Survey Operations	<a href="mailto:Dave.Costner@topographic.com">Dave.Costner@topographic.com</a>
Joel Vogt, PLS	Project Manager Survey	<a href="mailto:Joel.Vogt@topographic.com">Joel.Vogt@topographic.com</a>

#### **Mundus Bishop,** Landscape Architecture

Rachel Scarborough, PLA	Senior Landscape Architect	<a href="mailto:Rachel@mundusbishop.com">Rachel@mundusbishop.com</a>
Brittany Schroeder	Landscape Designer	<a href="mailto:Brittany@mundusbishop.com">Brittany@mundusbishop.com</a>

#### **Pinyon Environmental,** Stormwater Nutrient Removal Specialist

Caroline Byus	Senior Environmental Scientist	<a href="mailto:byus@pinyon-env.com">byus@pinyon-env.com</a>
Bridget Mitchell, PE, CFM	Technical Group Manager	<a href="mailto:Mitchell@pinyon-env.com">Mitchell@pinyon-env.com</a>

#### **Kumar & Associates, Inc.,** Geotechnical Engineering

Josh Barker, PE	Assoc. Principal, Sr Geotechnical Engineer	<a href="mailto:jbarker@kumarus.com">jbarker@kumarus.com</a>
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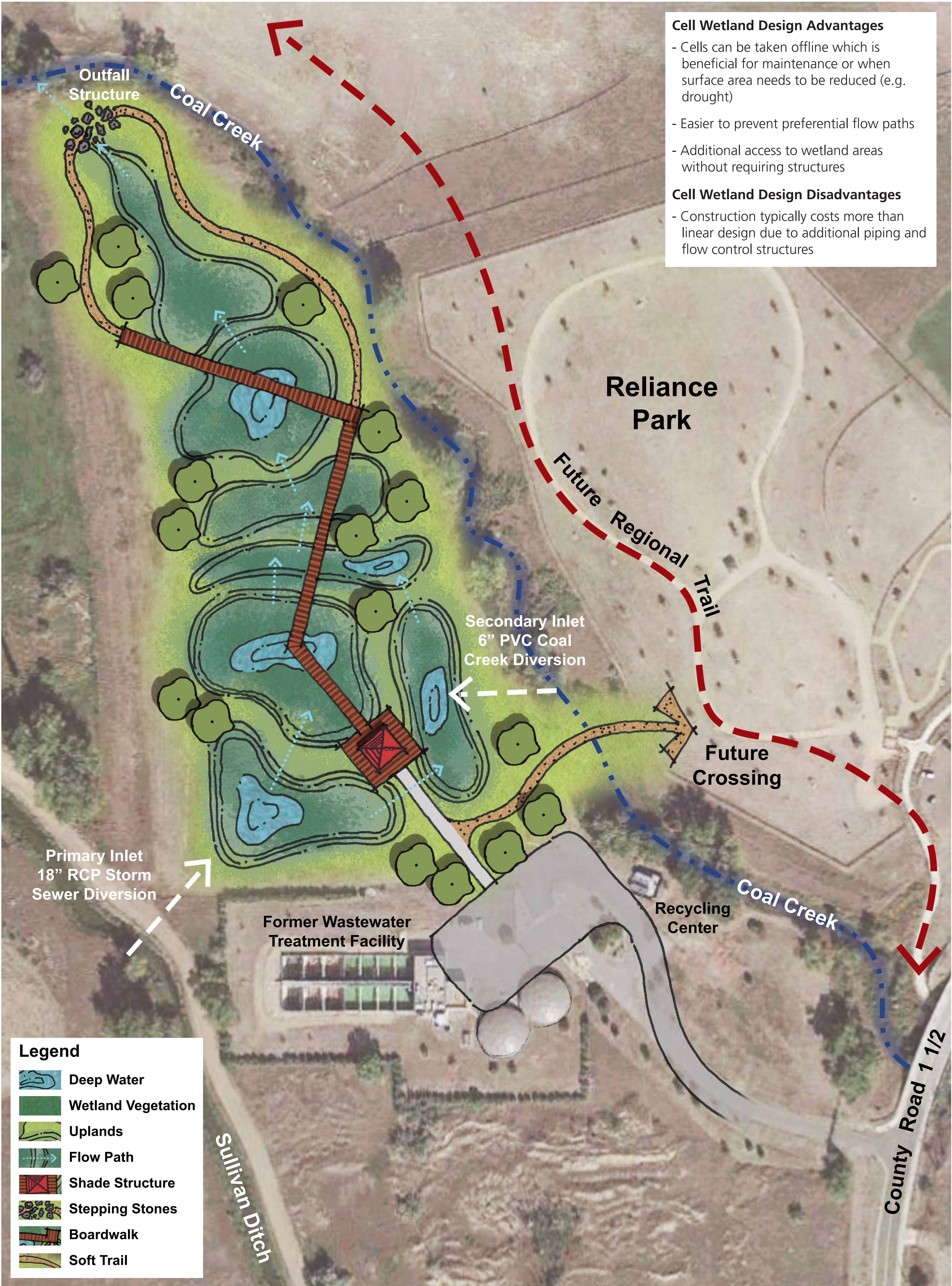
## **Appendices**

## **Appendix A – Original Concept Designs**











## **Appendix B – Survey Response Summary**

### Top 5 Takeaways (Survey Results: 51)

1. Habitat and wildlife will make Erie Lagoons a place people want to visit.
2. Discovery and learning will be enhanced by boardwalks, trails, and habitat.
3. Boardwalks, shade structures, and seating areas are amenities people would like to see.
4. Pedestrian/bicycle connections, wildlife observation/viewing areas, and shade are desired.
5. Access, wetland performance, a natural aesthetic, and amenities are elements to consider in design.

#### What will make Erie Lagoons Special?

1. Wildlife/Habitat (35%)
2. Walking Paths/Trails (18%)
3. Access (15%)
4. Recreation (12%)

#### What elements will enhance discovery learning?

1. Boardwalk (27%)
2. Soft Trails (21%)
3. Habitat (20%)

#### What Amenities would you like?

1. Boardwalk (19%)
2. Shade Structure (18%)
3. Benches/Seating (17%)

#### What features will improve your experience?

1. Pedestrian/Bicycle connect (27%)
2. Observation/Viewing Area (25%)
3. Shade (22%)

#### Things to consider:

1. Access/Circulation
2. Keep Natural and Performance
3. Amenities

#### What we heard:

“Consider accessibility for strollers/wheelchair”

“Year-round design strategy”

“Quiet space for relaxed sitting”

“Natural protective boundaries”

#### Dot Feedback:

1. Character - Boardwalk
2. Experience – Net climber
3. Wetland – Biodiversity

“Returning to a natural area, reducing human footprint”

### Top 5 Takeaways (Survey Results: 43)

1. A natural area with wildlife & habitat will make Erie Lagoons a place people want to visit.
2. Discovery and learning will be enhanced by habitat, natural play, and boardwalks.
3. Seating, shade structures, boardwalks, & soft surface trails are amenities people would like to see.
4. Pedestrian/bicycle connections, shade, and wildlife observation/viewing areas are desired.
5. Access, wetland performance, and views are elements to consider in design.

#### What will make Erie Lagoons Special?

1. Natural Area (30%)
2. Amenities (22%)
3. Circulation/Accessibility (15%)
4. Dog Access (15%)

#### What Amenities would you like?

1. Benches/Seating (18%)
2. Shade Structure (18%)
3. Boardwalk (16%)
4. Soft (Gravel) Trails (15%)

#### Things to consider:

1. Access/Circulation
2. Performance
3. Views

#### Dot Feedback:

1. Character – Shade & boulder seating
2. Experience – Net climber & trails
3. Wetland – Biodiversity

#### What elements will enhance discovery learning?

1. Habitat (24%)
2. Natural Play Area (23%)
3. Boardwalk (21%)

#### What features will improve your experience?

1. Pedestrian/Bicycle connect (25%)
2. Shade (24%)
3. Observation/ Viewing Areas (21%)

#### What we heard:

“Keep structures/trees low to keep unobscured views from Reliance Park & Northridge”

“Boardwalk wide enough for two people”

“Natural area where kids & families can interact with it”

“More open space to observe nature”

# Erie Wetlands

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ONLINE

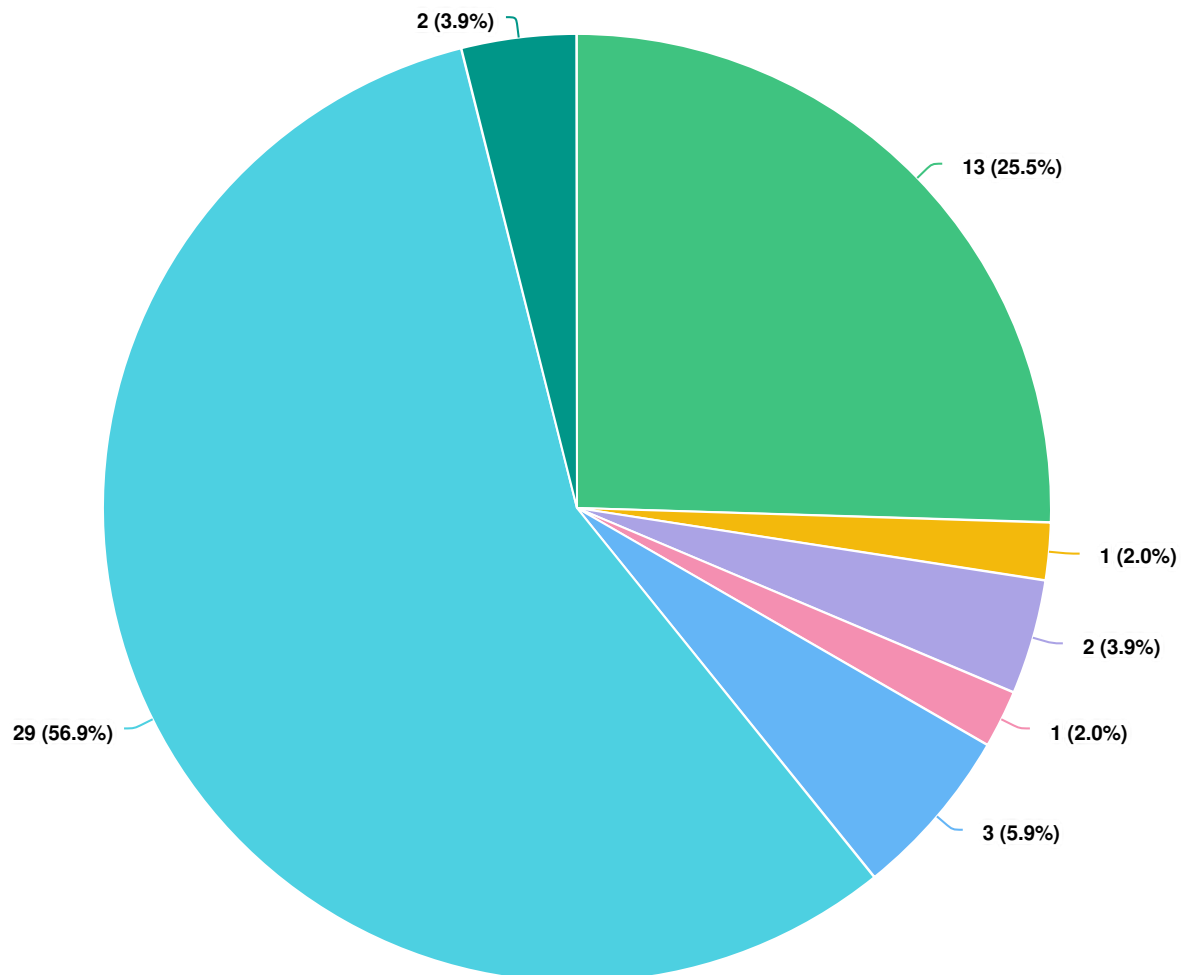
## SURVEY RESPONSE REPORT

24 October 2019 - 12 October 2021

PROJECT NAME:

Erie Wetlands

**Q5** What features will improve your experience at Erie Wetlands?

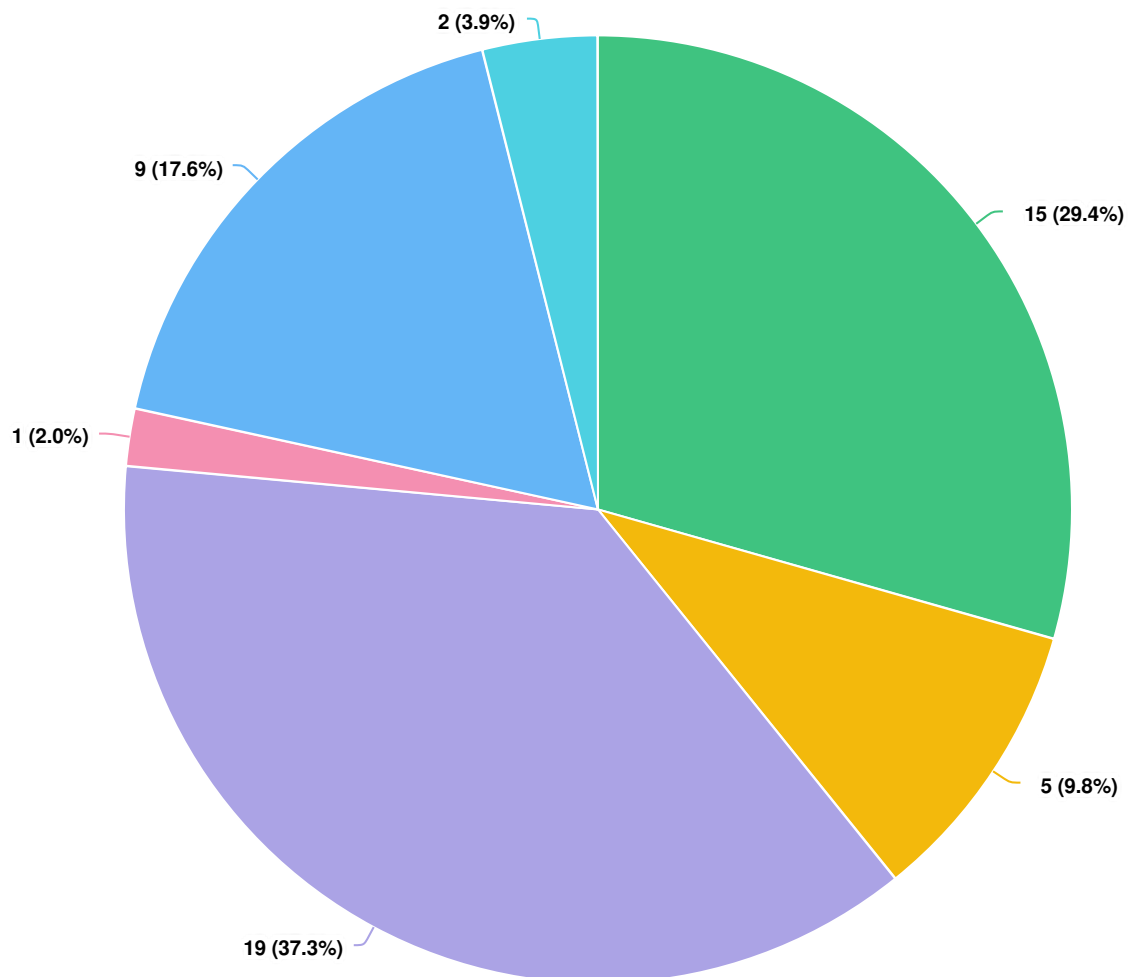


**Question options**

- Pedestrian/bicycle connections
- Arrival area and clear circulation
- Interpretive signage
- Outdoor gathering space
- Shade
- Observation/viewing areas to landscape and wildlife
- Other (please specify)

Optional question (51 response(s), 0 skipped)  
Question type: Radio Button Question

**Q6** What experience/elements will enhance discovery and learning?



**Question options**

Boardwalk Outdoor classroom Habitat Shade pavilion Natural play area Other (please specify)

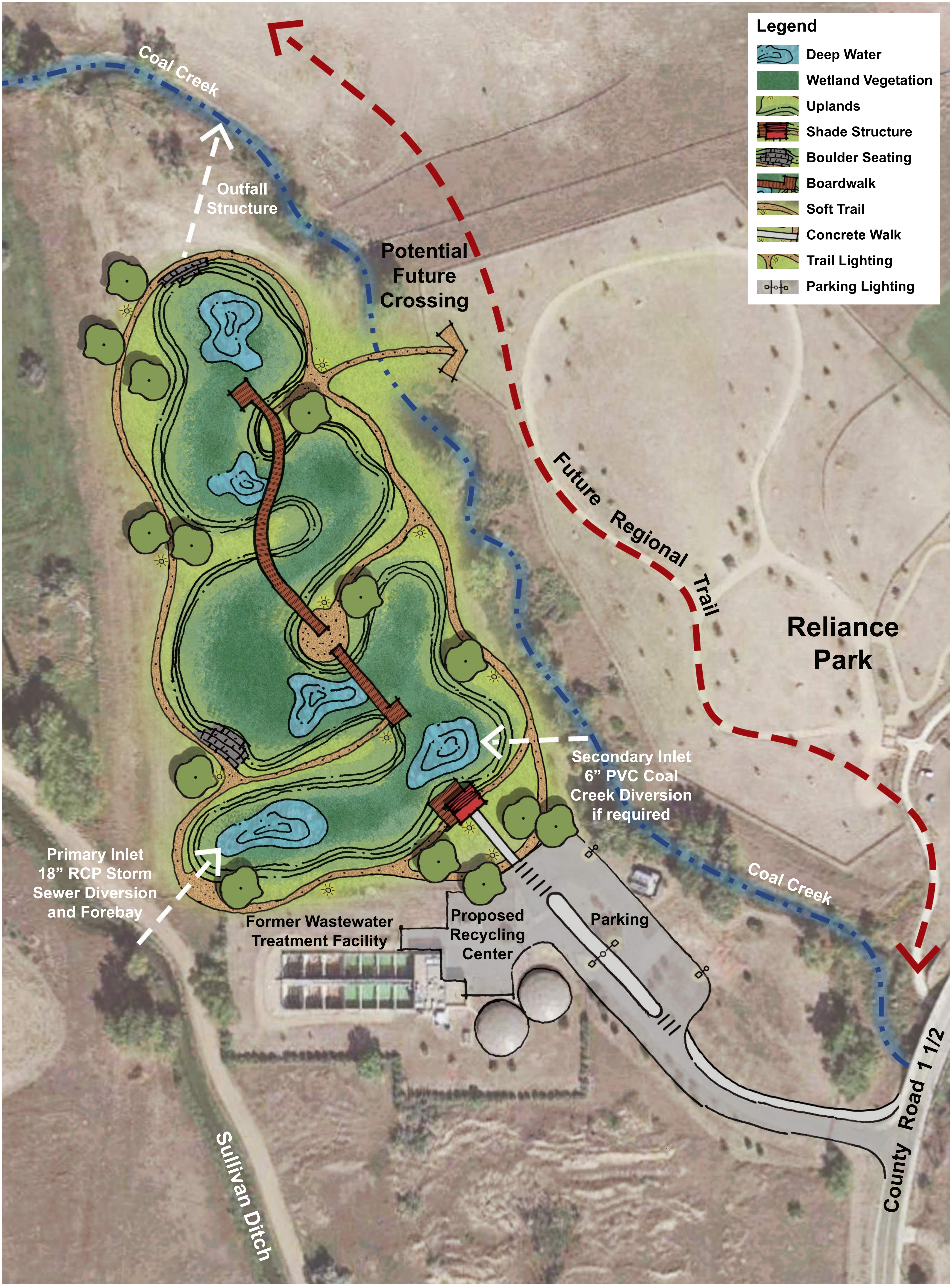
Optional question (51 response(s), 0 skipped)

Question type: Radio Button Question



## **Appendix C – Preferred Concept Design**





Preferred Concept - Linear Wetland Design







## BOARDWALK



## SIGNAGE



## GATHER

## SHADE



## DISCOVERY



## TRAILS

## Character and Experience



## **Appendix D – Environmental Wetland Delineation Memo & Exhibit**

## Town of Erie, Colorado Proposed Wastewater Treatment Lagoon Conversion to Water Quality Wetlands Weld County, Colorado

### Environmental Services Update

**Date:** October 21, 2021  
**Prepared For:** Town of Erie, Colorado  
**Prepared By:** Topographic Land Surveyors, Inc. (TLS) – Jason Voight, PWS

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Topographic was tasked with delineating aquatic features near the Town of Erie's former Wastewater Treatment Lagoon Site. The following presents the findings from that assessment as well as discussion with U.S. Army Corps of Engineers (USACE) Staff regarding the proposed project.

#### Aquatic Resource Delineation and Report:

On September 28, 2021, scientists from Topographic performed an on-site assessment to determine the extent of aquatic resources within an approximately 12.5-acre assessment area. The area assessed included Coal Creek from an area approximately 450 feet north of Briggs Street (County Road 1 ½) to an area approximately 80 feet west of an existing stormwater outfall located north of the former treatment lagoon system along the southern streambank for Coal Creek. The assessment also included the two basins formerly used as treatment lagoons. The western extent of the assessment area was the former railroad right of way known as the Burlington Northern Topeka Boulder Line and the southern extent was the current recycling facility. As shown on **Figure A-1** included in **Attachment A**, aquatic features delineated during the assessment included Coal Creek and the two former treatment lagoons.

- Coal Creek is considered a perennial stream. Within the assessment area, Coal Creek occupied approximately 1,340 linear feet and 0.39 acres.
- The two former treatment lagoons did contain vegetation adapted to living in saturated soil conditions (also known as hydrophytes or wetland vegetation). The dominant hydrophytic vegetation observed was cattail (*Typha spp.*) and reed canary grass (*Phalaris arundinacea*). The northern lagoon basin occupies approximately 1.56 acres, and the southern lagoon basin occupies approximately 2.83 acres.

In the aquatic resource delineation report, Topographic intends to provide the following opinions:

- Coal Creek is a water of the U.S. and subject to Section 404 of the Clean Water Act regulations
- The former treatment lagoons are considered man-made features for the express purpose of wastewater treatment that are currently out of operation

Our intent after Town of Erie staff review of the delineation report is to request an "Approved Jurisdictional Determination" (AJD) from the USACE. The findings and conclusions in a delineation report are the opinion of

Topographic based on best professional judgement. The USACE has the ultimate authority over jurisdictional determinations for aquatic resources delineated within an assessment area. Therefore, we recommend that the delineation report be verified by the USACE. USACE verified delineations result in Approved Jurisdictional Determinations or AJDs. Why does this matter? If an aquatic resource can be deemed ineligible for coverage under the Clean Water Act, aquatic resource mitigation for impacts to that resource is not necessary – it is basically a potential cost savings for the Town in both permitting time and money.

## **Conversations with the USACE to Date:**

On October 4, 2021, Topographic contacted Mr. Cody Wheeler with the Denver USACE Regulatory Division. The following topics were discussed with Mr. Wheeler

- Wetland Mitigation Banking Potential
- Former Treatment Lagoons
- Section 404 of the Clean Water Act Permitting

With regard to Wetland Mitigation Banking Potential, Mr. Wheeler was in agreement that the limited size of the proposed wetland system to replace the former treatment lagoons compared to the steps to get a “wetland mitigation bank” approved was likely not worth the effort – there are insufficient number of credits that can be generated from the wetland creation to offset the costs to get the wetland mitigation bank approved. A discussion of using Coal Creek for Stream Mitigation ensued. An opportunity to consider, provided the Town of Erie owns both banks of Coal Creek, is to use Coal Creek as a mitigation stream bank.

Other issues to consider for mitigation banking, any lands used for a mitigation bank would have to be encumbered by a conservation easement. This encumbrance would limit activities within the bank, including maintenance activities, and would negatively impact the Town’s ability to maintain the pond.

With regard to the former treatment lagoons, we discussed the jurisdictional nature of the lagoons since they have been left fallow for some time. Mr. Wheeler mentioned the recent vacating of the Navigable Waters Protection Rule and the murky nature of what constitutes jurisdictional wetlands and waters under current guidance. Mr. Wheeler suggested we submit our findings from the aquatic resources delineation and request an Approved Jurisdictional Determination. He did mention that, regardless of the jurisdictional call associated with the lagoons, he would assume the project would be self-mitigating since it is a beneficial project.

With regard to permitting, Mr. Wheeler mentioned that since this is a beneficial project, permitting should not be a major issue.

Once the aquatic resource delineation report is submitted to the USACE, we will request a preapplication meeting with the USACE to discuss the project. This may be a virtual appointment considering current Covid restrictions.

## **Wetland Design and Water Right Concerns:**

Topographic staff is currently working on the preliminary design for the wetland. During this effort, we will be performing a water budget analysis to discern if supplemental hydrology would be necessary to maintain wetland vegetation during “dry months” or during periods of drought. We will convey the results of the water budget as soon as possible to Town of Erie staff once a more defined footprint for the wetland is designed. At this point, a conservative water budget to discern bookend needs is currently being developed.





### Legend

- Assessment Area
- Identified Stormwater Outfall
- Coal Creek Ordinary High Water Mark
- Former Wastewater Treatment Lagoon Basins

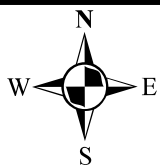


FIGURE 1 OF 1

300 150 0 Feet

## FIGURE A-1: AQUATIC RESOURCE DELINEATION

### TOWN OF ERIE PROPOSED CONSTRUCTED WETLAND FOR STORMWATER POLISHING PROJECT WELD COUNTY, COLORADO



520 STACY COURT, UNIT B  
LAFAYETTE, COLORADO  
80026  
PHONE: (303) 666-0379  
FAX: (817) 744-7554

DATE: 10/21/2021

## **Appendix E – Nutrient Removal Memo**

## DRAFT Technical Memorandum

**Date:** October 22, 2021  
**To:** Deborah Reuter, Topographic  
**From:** Bridget Mitchell and Caroline Byus, Pinyon Environmental, Inc.  
**Subject:** Town of Erie Lagoon Conversion – Preliminary Approach to Determine Nutrient Removal

---

### Introduction

Pinyon Environmental, Inc. (Pinyon) understands the Town of Erie (Town) plans to repurpose wastewater lagoons and convert them to a stormwater quality feature at the Wastewater Treatment Facility north of Old Town Erie. Pinyon is performing as a subconsultant to Topographic and is tasked with estimating Nutrient Credit Offsets pursuant to the Colorado Water Quality Control Commission's Voluntary Incentive Program for Early Nutrient Reductions (Policy 17-1). This memorandum provides a preliminary summary of one approach to estimate nutrient removal that could potentially result from the proposed stormwater quality feature. Note that information in this memorandum is intended to share Pinyon's progress toward establishing project nutrient removal estimates based on available empirical data, and efforts to apply those data to project conditions. Pinyon is in the early stages of evaluating methods and results. Final results of our nutrient reduction evaluation will be summarized in a technical memorandum provided later this year that will also include, to the extent possible, estimates of potential nutrient offsets in the context of Policy 17-1 for the Town's consideration, and Pinyon's conclusions and recommendations if further action is warranted.

### Nutrient Removal Calculation

The following is a summary of Pinyon's progress toward gaining a rough estimate of potential nutrient removal from the stormwater quality feature. The following steps have been completed.

- Step 1 – Collect drainage area information.
- Step 2 – Assess existing nutrient loading for drainage area.
- Step 3 – Determine stormwater feature type and Water Quality Capture Volume (WQCV).
- Step 4 – Assess potential nutrient removal from proposed stormwater feature identified in Step 3.

**Step 1** - Pinyon used the Town's "Outfall Systems Plan (West of Coal Creek)" document prepared by RESPEC for UDFCD and the Town in January 2014 to obtain drainage area information contributing to the existing 54" drain pipe adjacent to the lagoon area. Figure 1 (attached) and Table 1 below summarize drainage area information.

**Table 1. Drainage Area Information**

<u>Subbasin ID</u>	<u>Area (Acres)</u>	<u>% Existing Impervious</u>	<u>% Future Impervious</u>
<u>483</u>	<u>27</u>	<u>62%</u>	<u>62%</u>
<u>484</u>	<u>79</u>	<u>35%</u>	<u>35%</u>
<u>485</u>	<u>128</u>	<u>27%</u>	<u>27%</u>
<u>486</u>	<u>89</u>	<u>30%</u>	<u>47%</u>
<u>Total</u>	<u>323</u>	<u>33%</u>	<u>37%</u>

**Step 2** – Pinyon used Schueler’s *Simple Method* to calculate nutrient loads including Total Phosphorus and Total Nitrogen from the contributing 323-acre drainage area as presented in New York State Stormwater Management Design Manual. The *Simple Method* estimates pollutant loads for chemical constituents as a product of annual runoff volume and pollutant concentrations as detailed below. This method is used readily by universities, state environmental agencies, and the Environmental Protection Agency (EPA) as a nutrient estimation tool for watershed protection. This method is typically used at the site-planning level to predict pollutant loadings and requires a modest amount of data input.

$$L = 0.226 * R * C * A$$

L = Annual load (lbs)

R = Annual runoff (inches)

C = Pollutant concentration (mg/L)

A = Areas (acres)

0.226 = Unit conversion factor

Annual runoff, R is calculated as:

$$R = P * P_j * (0.05 + 0.9 * I_a)$$

P = Annual rainfall (inches)

P<sub>j</sub> = Fraction of annual rainfall events that produce runoff (usually 0.9)

I<sub>a</sub> = Impervious fraction

Table 2 below provides a summary of estimated nutrient annual loads contributing to the existing 54-inch storm sewer based on the Simple Method.

**Table 2. Summary of Nutrient Load**

<b>Nutrient</b>	<b>Annual Load to Water Feature (lbs)</b>
Total Phosphorus	61
Total Nitrogen	470

An average annual rainfall (P) of 10.4 inches was calculated using data obtained from Northern Water’s weather station #103 “Longmont South” for the period of January 2018 through December 2020. (<https://www.northernwater.org/WaterConservation/WeatherandETData.aspx>). The impervious fraction (I<sub>a</sub>, 33%) was obtained from the Town’s “Outfall Systems Plan (West of Coal Creek)” presented in Step 1. Pollutant concentration (C) was obtained from the *National Median Concentrations for Chemical Constituents in Stormwater* presented in New York State Stormwater Management Design Manual. A Total Phosphorus concentration of 0.26 mg/L and Total Nitrogen concentration of 2.00 mg/L was used.

**Step 3** – Pinyon met with the Topographic design team on October 12, 2021 and learned that the proposed stormwater quality feature will be a wetland pond with serpentine channel. Pinyon also confirmed that the proposed wetland pond is estimated to accommodate the water quality capture volume (WQCV) for the drainage area contributing to the existing 54-inch storm sewer per Mile High Flood District (MHFD) calculations.

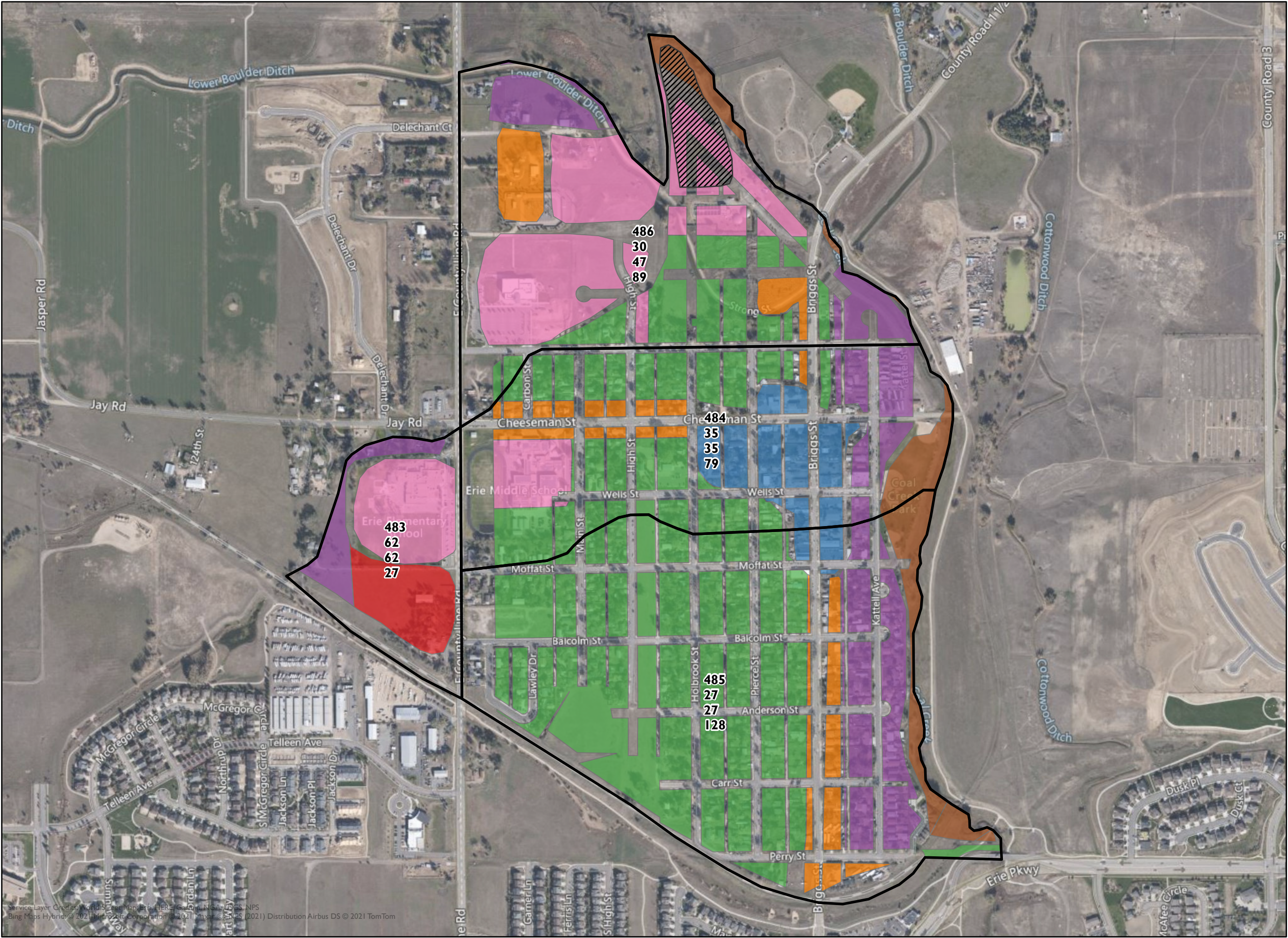
**Step 4** – Pinyon used suggested removal rates for a stormwater wetland feature presented in the New York State Stormwater Management Design Manual: 44% Total Phosphorus removal and 27% Total Nitrogen Removal. Table 3 summarizes estimated nutrient load in, removed, and out.

**Table 3. Summary of Nutrient Loads In and Out**

<b>Nutrient Parameter</b>	<b>Annual Nutrient Load to Water Feature In (lbs)</b>	<b>Estimated Amount Removed by Water Feature (lbs)</b>	<b>Annual Nutrient Load Discharged from Water Feature (out, lbs)</b>
Total Phosphorus	61	27	34
Total Nitrogen	470	127	343

The above analysis provides a preliminary estimate of the potential annual load reduction for total nitrogen and phosphorus from the proposed water quality feature. Pinyon is in the process of investigating other approaches for estimating nutrient load reductions for comparison to the Simple Method. Pinyon will use information from the load reduction analyses to determine potential nutrient offsets as described under the VIP for the Town's consideration. This information will be provided in the final technical memorandum.





## Legend

- Lagoon Area
- Subbasins
- Land Use**
  - Business
  - Downtown
  - Light Density Residential
  - Medium Density Residential
  - Mixed Use
  - Open Space
  - Public/Quasi-Public

Subbasin labels are:  
Catchment  
% Impervious (Existing Land Use)  
% Impervious (Future Land Use)  
Acreage



0 300 600  
Feet  
1:7,200



**Lagoon Conversion Stormwater  
Pond - Drainage Area Map**  
Town of Erie  
645 Holbrook Street  
Erie, Colorado 80516

Site Location: 105°3'5"W 40°3'2"N

Pinyon Project Number: I/21-1476-01

Drawn By: JAF

Figure: I

Reviewed By: BDM

Date: 10/21/2021

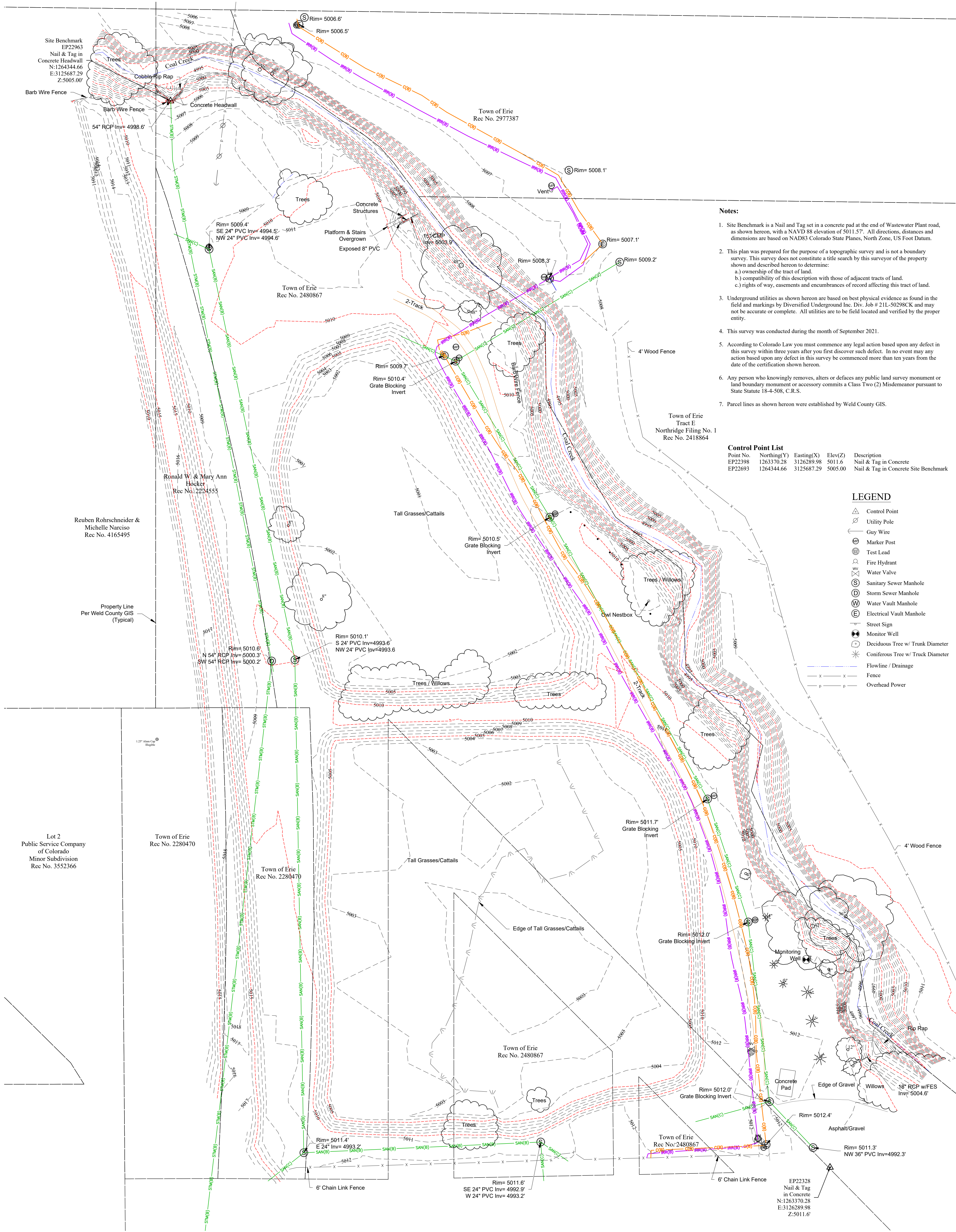


## **Appendix F – Updated Topographic Survey**



# Topographic Survey Erie Lagoon

A Portion of the northwest quarter of Section 18, Township 1  
North, Range 68 West of the Sixth Principal Meridian  
Town of Erie, Weld County, Colorado



## Notes:

- Site Benchmark is a Nail and Tag set in a concrete pad at the end of Wastewater Plant road, as shown hereon, with a NAVD 88 elevation of 5011.57'. All directions, distances and dimensions are based on NAD83 Colorado State Planes, North Zone, US Foot Datum.
- This plan was prepared for the purpose of a topographic survey and is not a boundary survey. This survey does not constitute a title search by this surveyor of the property shown and described hereon to determine:
  - ownership of the tract of land.
  - compatibility of this description with those of adjacent tracts of land.
  - rights of way, easements and encumbrances of record affecting this tract of land.
- Underground utilities as shown hereon are based on best physical evidence as found in the field and markings by Diversified Underground Inc. Div. Job # 21L-50298CK and may not be accurate or complete. All utilities are to be field located and verified by the proper entity.
- This survey was conducted during the month of September 2021.
- According to Colorado Law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon.
- Any person who knowingly removes, alters or defaces any public land survey monument or land boundary monument or accessory commits a Class Two (2) Misdemeanor pursuant to State Statute 18-4-508, C.R.S.
- Parcel lines as shown hereon were established by Weld County GIS.

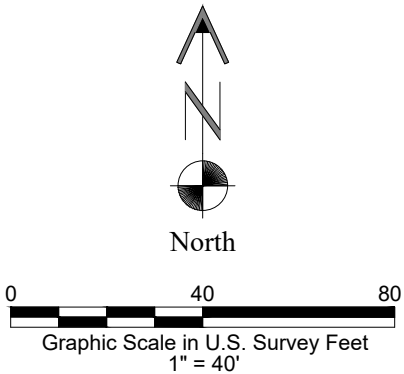
## Control Point List

Point No.	Northing(Y)	Easting(X)	Elev(Z)	Description
EP22398	1263370.28	3126289.98	5011.6	Nail & Tag in Concrete
EP22693	1264344.66	3125687.29	5005.00	Nail & Tag in Concrete Site Benchmark

## LEGEND

	Control Point
	Utility Pole
	Guy Wire
	Marker Post
	Test Lead
	Fire Hydrant
	Water Valve
	Sanitary Sewer Manhole
	Storm Sewer Manhole
	Water Vault Manhole
	Electrical Vault Manhole
	Street Sign
	Monitor Well
	Deciduous Tree w/ Trunk Diameter
	Coniferous Tree w/ Trunk Diameter
	Flowline / Drainage
	Fence
	Overhead Power

Quality Level B	Quality Level C	Quality Level D
Electric E(B)	Electric E(C)	Electric E(D)
Electric & Communication E/C(B)	Electric & Communication E/C(C)	Electric & Communication E/C(D)
Communication C(B)	Communication C(C)	Communication C(D)
Gas G(B)	Gas G(C)	Gas G(D)
Sanitary Sewer SAN(B)	Sanitary Sewer SAN(C)	Sanitary Sewer SAN(D)
Storm Sewer STM(B)	Storm Sewer STM(C)	Storm Sewer STM(D)
Water W(B)	Water W(C)	Water W(D)
Irrigation IRR(B)	Irrigation IRR(C)	Irrigation IRR(D)
Unknown UNK(B)	Unknown UNK(C)	Unknown UNK(D)





## **Appendix G - Closure/Decommissioning Document**



March 2021

## **Information Regarding** **Domestic Wastewater Treatment Works Closure/Decommissioning**

### **Background**

When a domestic wastewater treatment works (including all domestic wastewater treatment facilities (WWTF) and appurtenances as defined in Regulation 22 - treatment plants, lift stations, etc.) is decommissioned, the decommissioning efforts must be completed in a way that ensures protection of waters of the state (e.g., surface water, groundwater) and the surrounding environment in accordance with appropriate environmental regulations. This document is intended to provide information regarding the relevant Colorado Department of Public Health and Environment (Department) regulations to assist entities in the development of plans to decommission all or portions of a domestic wastewater treatment works. There may be other Federal, State, and local regulations and requirements regarding decommissioning or other activities at the facility; this document does not address these. It is the responsibility of the facility owner to comply with the individual regulations.

This document includes domestic wastewater treatment works decommissioning-related information as it pertains to the following:

- Site Location Application and Design Approval
- Liquids Management
- Biosolids Management and Disposal
- Solid Waste Management and Disposal
- Discharge Permit Termination
- Note Regarding Previous Guidance

### **Site Location Application and Design Approval**

Decommissioning of a domestic wastewater treatment works does not require site location approval and design approval. However, if a new domestic wastewater treatment work is being constructed to replace (in whole or in-part) decommissioned facilities, the new facility will need to receive site location approval and design approval from the Water Quality Control Division (WQCD) in accordance with the Colorado Water Quality Control Act, Section 25-8-702 and Site Location And Design Regulations For Domestic Wastewater Treatment Works 5 CCR 1002-22 (Regulation 22). Regulation 22 can be accessed at:

<https://cdphe.colorado.gov/water-quality-control-commission-regulations>. There are fees associated with the site application and design review processes. For instructions regarding the fee request procedure, please refer to: <https://cdphe.colorado.gov/design>.

### **Liquids Management**

In accordance with the Colorado Water Quality Control Act, Section 25-8-501, no point source discharges of water and/or contaminants from a facility to the waters of the State are authorized unless a permit for such discharges has been issued by the WQCD. Information regarding permit issues or requirements can be accessed at: <https://cdphe.colorado.gov/water-quality-permits>.



### **Biosolids Management and Disposal**

Biosolids must be completely removed from the decommissioned WWTF and managed in accordance with Federal Requirements in 40 CFR 503 and the Colorado Biosolids Regulation 5 CCR 1002-64 (Regulation 64). Regulation 64 can be accessed at:

<https://cdphe.colorado.gov/water-quality-control-commission-regulations>. For questions regarding biosolids issues or requirements, either general or land application, please contact Tim Larson in the WQCD Permits Section at [tim.larson@state.co.us](mailto:tim.larson@state.co.us). Disposal options for removed biosolids must also conform with Federal Requirements 40 CFR 503, 40 CFR 258, and the requirements of the Colorado Regulations Pertaining to Solid Waste Sites and Facilities 6 CCR 1007-2, as applicable (<https://cdphe.colorado.gov/swregs>).

### **Solid Waste Management and Disposal**

Waste materials at a decommissioned WWTF (e.g., liners, basins, etc.) must be properly managed in accordance with Regulations Pertaining to the Solid Waste Sites and Facilities 6 CCR 1007-2 (Solid Waste regulations) and the Solid Wastes Disposal Sites and Facilities Act, Title 30, Article 20, Part 1, Colorado Revised Statutes (CRS), as amended. Materials management may include beneficial reuse of some materials. Information regarding the Solid Waste regulations can be accessed from the Hazardous Materials and Waste Management Division (HMWMD) at: <https://cdphe.colorado.gov/swregs>. Information regarding the beneficial use program is at: <https://cdphe.colorado.gov/recycling>.

### **Discharge Permit Termination**

If a WWTF is being decommissioned, the facility will need to terminate the existing discharge permit, if a continuing discharge will not be needed. Once the WWTF discharge has been eliminated, the WWTF biosolids have been removed and managed, and the decommissioned WWTF waste materials have been managed in accordance solid waste regulations, the permittee must request termination of the permit from the WQCD in accordance with the Colorado Discharge Permit System Regulations (Regulation 61). Regulation 61 can be accessed at: <https://cdphe.colorado.gov/water-quality-control-commission-regulations>. Information regarding permit issues, requirements, and termination form can be accessed at: <https://cdphe.colorado.gov/water-quality-permits>.

### **Note Regarding Previous Guidance**

This revision does not change the substantive content of the previous version of this information (2013), but updates website references and department branding.

[cdphe.colorado.gov/design](https://cdphe.colorado.gov/design)

