

REQUEST FOR PROPOSAL #2022-02-01

PROPOSAL: **Flood Mitigation – Environmental Management Services**

DATE: **February 1, 2022**

INITIATOR: **Deighen Blakely, P.Eng., Project Director**

DATE PROPOSAL REQUIRED:

YEAR: **2022** MONTH: **February** DAY: **22** TIME: **2:00 PM Local Time**

Submit Proposal via email to the attention of:

Procurement Department:
Town of Drumheller
224 Centre Street
Drumheller, Alberta T0J0Y4

Email submission: purchasing@drumheller.ca

“RFP - Flood Mitigation – Environmental Management Services RFP 2022-02-01”

This Request for Proposal document is comprised of:

- RFP General Instructions
- Schedule A – Proposal Submission Form
- Schedule B – December 24, 2020 Alberta Environment Water Act Application
 - January 29, 2021 Water Act Approvals Presentation
 - October 20, 2020 Historical Resources Act Requirements

If you do not have all these components the RFP package is incomplete - please contact the Initiator.

Your firm is invited to submit a Proposal, pursuant to the general conditions for the scope of work as described. This Proposal shall not be considered authorization to proceed with work herein described. All Procurement processes must comply with Town of Drumheller Purchasing Policy C-09-20.

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1. INVITATION

The Town of Drumheller, recognized as the “Dinosaur Capital of the World”, is rich in geological and paleontological history. The breathtaking landscapes surrounding Drumheller are unique in Canada and draw hundreds of thousands of visitors every year.

The Town of Drumheller is a flood community with major floods having occurred in 1902, 1915, 1932, 1954, 1991, 2005, 2013, and 2018. While some areas in Drumheller have existing flood mitigation infrastructure, additional work is needed to improve upon Drumheller’s level of flood mitigation and resiliency. The Town of Drumheller has chosen to make significant investment to mitigate flooding throughout the Valley. Council’s Vision is:

Through a proactive flood-mitigation strategy, we are committed to changing the channel on flood readiness with a sustainable plan to protect Drumheller from future flooding. Together, we will shape the future of our community by protecting our people, our property, our economic growth, our environment and our cultural heritage.

In 2019 the Town was approved for \$55M in funding through the Government of Canada’s Disaster Mitigation and Adaptation Fund, the Government of Alberta’s Community Resiliency Program, and from the Town of Drumheller. In 2020 preliminary design work commenced to identify areas requiring additional flood mitigation works and to identify property acquisition requirements. In 2021, the Flood Office implemented a multi-discipline Design Team to undertake the project. The primary Engineering Design teams include:

- Klohn Crippen Berger (KCB)
- Kerr Wood Leidal Associates Ltd. (KWL)
- Sweet Tech Engineering Consultants (SWT)
- Wood Environment & Infrastructure Solutions (Wood)

The Flood Mitigation Program consist of twelve (12) major projects; additional projects may be added depending on funding availability. Provided below is a list of each of the major projects, engineering design firms and anticipated construction schedule. Construction cost of each project is estimated to be between \$3M-\$4M. A detailed project schedule can be found at <https://floodreadiness.drumheller.ca/public/download/files/199403>.

Project	Consultant	Construction Schedule
Midland	KCB	Q3 – Q4 2022
Newcastle	KCB	Q3 – Q4 2022
Drumheller (Dike D – Downtown Phase 1)	SWT	Q2 - Q3 2022
Drumheller (Dike D – Downtown Phase 2)	SWT	Q3 – Q4 2022
Drumheller Willow Estates	Wood	Q3 - Q4 2022
North Drumheller (Dike B and C)	KWL	Q3 – Q4 2022
Hospital Dike Extension	KWL	Q2 – Q3 2023
North Drumheller (Dike A West and Michichi Creek Realignment)	KWL	Q3 – Q4 2024
Nacmine	Wood	Q2 – Q4 2023
East Rosedale	Wood	Q2 – Q3 2023
East Coulee	Wood	2024
Rosedale Highway 10X	KWL	To Be Confirmed
Rosedale Scarlett	KWL	To Be Confirmed
Cambria	KWL	To Be Confirmed
Lehigh (buyout reclamation)	Wood	To Be Confirmed

In December 2020 a preliminary Water Act application package was submitted to Alberta Environment (Appendix A) providing project descriptions for each project and summarizing the environmental work completed to date. The supporting reports and documentation can be found on the Town of Drumheller Flood Mitigation website https://floodreadiness.drumheller.ca/,_on_the_Be_Informed\Resources\Drumheller_Resiliency_and_Flood_Mitigation_Office_page. Based on this submission and subsequent meetings, the Province has indicated that Town’s current Water Act approval can be amended to reflect the new and existing dike upgrades. However, projects involving instream works like the Nacmine Dike, Willow Estates Dike, and Michichi Creek realignment projects will require formal Water Act approvals.

In addition to the above the following environmental work has been completed since the 2020 application:

- regular update meetings and discussions have been held on a quarterly basis with representatives with Alberta Environment
- preliminary discussions with Department of Fisheries and Oceans (DFO) and Transport Canada Navigable Waters
- initial Indigenous consultation has been completed and Adequacy Assessment received from Government Alberta. However, this consultation did not include the in-stream work component.
- submission to Alberta Culture, Multiculturalism and Status of Women and subsequent response letter and Schedule of Requirements dated Oct 30, 2020
- Urban Forestry Strategy – November 2021

- Tree health assessments completed in 2021 for Dike D, Newcastle. and Midland dikes
- Tree clearing for Dike D, Newcastle and Midland dikes to be completed by March 31, 2022. Owl survey and bord sweep scheduled and not part of the scope of this proposal
- Dike D historical and paleontological approvals

To date, much of the Environmental coordination has been managed by the Flood Office with the assistance of the Project Consulting Team. Each Design Team is responsible for identifying their project specific environmental design elements. To provide consistency between all the projects, the Flood Office is looking for a firm to provide the overall project environmental, historical, paleontological coordination, support Water Act and DFO approvals, and quality assurance monitoring of contractor activities during construction. The Town invites organizations to submit a formal proposal to provide Environmental Management Services (the “Services”) with the intent to negotiate and enter into a Contract with the with the Town. The individual or organization proposing to provide the Services is referred to in this request as the “Proponent.”

The Scope of Services sets out the detailed tasks, duties, expectations and responsibilities. Also provided is the approach that could be considered in the provision of the Services. It is not necessarily expected that you or your organization would deliver the Services in the same manner. Your proposal may include an alternative or varied approach to the delivery of the Services with various duties and responsibilities allocated among a number of different individuals.

Your submission should address the following:

- Relevant Capabilities and Experience that would demonstrate the ability of you or your organization to effectively provide the services required.
- Project Lead and experience on similar municipal and local government projects in particular with projects overseeing a number of engineering consultants and disciplines.
- Bring a strong, diverse team with experienced subject matter experts that can bring innovative, out of the box strategies to effectively communicate and engage Town residents to meet the desired outcomes. If a multi-firm consulting team is proposed, identify each firm’s role, scope, and design lead.
- Individuals who would be involved in the delivery of services to the Town, their intended role and their experience and qualifications.
- Approach to the delivery of the services.
- The basis for determining Fees and Charges to the Town for providing the Services.
- The charge out rates for specific people based on time or other units that you would propose through the term of the contract.
- If not prescribed specifically, how future increases in fees and variable charges would be determined.

The length of Term of Contract will be for one (1) calendar year period commencing on March 1, 2022. The Town reserves the right to extend the contract for a maximum of two (2) additional calendar years.

2. PROPOSAL MANDATORY REQUIREMENTS

Proposals must comply with the following requirements in order to be considered by the Town. It will be at the Town's sole discretion to determine if a Proposal shall be disqualified due to insufficient or incomplete information.

Rejection of Proposals

The Town shall not be obligated to accept Proposals that are unsigned, incomplete, conditional, illegal, or contain irregularities of any kind or if the Proponent fails to meet all of the requirements stated in this Request. The Town also reserves the right to disqualify any Proponent's submission whose credentials or performance have been unsatisfactory in the past.

Town's Discretion

Funding contribution agreements require, insofar as practicable, that public solicitation be made for contracts carried out under this funding arrangement. The Town reserves the right to accept any Proposal, and not necessarily the lowest cost Proposal.

Proposal Format Requirements

Proposals shall not exceed **twenty (20) single sided pages, 8 1/2 X 11, 11 pt. font**. Cover letters, table of contents, organizational charts, personnel resumes, and appendices will not be considered in the number of pages.

Submissions

Proposals are to be **submitted via email** to the email address provided clearly marked "**TOD RFP #2022-02-01 Flood Mitigation Environmental Management Services**". The body of the proposal is to be provided in single pdf maximum 10Mb file size. Appendices and supporting documentation are to be provided in separate pdf attachment(s).

Proposal Requirements

- **Project Understanding** – Proposals shall provide a clear understanding of the objectives and critical issues that could affect the outcome of the project. The Proponent should include a clear explanation of their proposed approach and may include any innovative ideas pertaining to delivery of the project.
- **Key Staff and Qualification** - A resume shall be provided for each staff member that includes, but is not limited to, qualifications, education, experience, capability and current workloads. The Project Manger shall have at least ten (10) years management experience in delivery of multi-discipline project team. Two (2) client references and relevant projects shall be provided for the Project Manager.

The proposal shall include:

- Organizational chart identifying key personnel, roles and responsibilities.
 - Supporting personnel.
 - Location of key personnel. While it is envisioned that most of the work can be done remotely, travel to Drumheller may be required from time to time to facilitate Town Hall meetings, Council presentations, or to meet with residents.
- **Relevant Project Experience** - The Proponent must identify past project experience on similar projects which showcase the team's qualifications and capabilities. Emphasis should be given to projects completed within the past five (5) years undertaken within a municipal government environment. The Proponent is to provide a minimum of three (3) Client references which should include the following:
 - The Client name, address, and telephone number.
 - Identify project team members involved on the project,
 - The name, title, and contact information for the Primary Contact.
 - The title, date, description, and relevancy of the work performed.
 - Length and value of the Contract.
 - **Budget** – It is understood that costs and labour requirements will vary throughout the life of the project. For the purpose of evaluating the proposals, Proponents are to identify personnel, time commitment, and anticipated average monthly coordination/construction service fee. Proposals are to include hourly rate schedule, disbursements, and estimation of annual rate increases for key project personnel.
 - **Additional Content** – Proponents may at their discretion include additional information which they consider relevant to ensure a full and proper evaluation, provided that the specified maximum twenty (20) page limit is not exceeded.

RFP Clarifications/Addenda

Proponents shall carefully examine the Request for Proposal Documents and report any errors, omissions, discrepancies or clauses requiring clarification. When deemed necessary, the Town shall respond to questions and clarifications by way of Addenda to report any changes to the Request for Proposal Documents. Any addenda issued prior to the closing date will form part of the Request for Proposal Documents.

Question or Inquiries

Questions may be submitted via email and directed to the contact person listed below:

Mark Steffler, P.Eng.
Flood Resiliency – Technical Adviser
msteffler@drumheller.ca
Phone (403) 660-3507

Proposal Review

The Proposals will be reviewed by Selection Committee on a confidential basis and may shortlist those proponents that they wish to interview. A Recommendation for Award of the successful Proponent is tentatively scheduled for Council approval at the March 7, 2022 Regular Council Meeting.

RFP Cancellation

The Town reserves the right to cancel this Request for Proposal for any reason without any liability to any proponent or to waive irregularities and informalities at their own discretion. No payment will be made by the Town for costs incurred in the preparation or submission of this document.

Insurance

The successful Proponent must be able to provide proof of the following insurance:

- General Liability Insurance in an amount not less than Two Million Dollars (\$2,000,000) per occurrence for personal injury and/or property damage.
- Automobile Liability Coverage in an amount not less than Two Million Dollars (\$2,000,000) per accident for bodily injury and/or property damage.

Conflict of Interest

The Proponent shall have no pecuniary interest in the business of any third party that would cause, or seem to cause, a conflict of interest in carrying out any Consulting Services for the Town. Should such an interest be acquired during the Proposal process, the Consultant shall immediately declare it to the Town. The Town will, immediately upon notification, take action as it deems appropriate. This may include rejection of the submitted Proposal.

Proposal Confidentiality

All documents submitted to the Town will be subject to the protection and disclosure of the Alberta Freedom of Information and Protection of Privacy Act (FOIP ACT).

3. SCOPE OF SERVICES

The Proponent will manage and coordinate the environmental services for the Flood Mitigation program. The scope of work shall include:

Environmental Coordination

- Attend bi-weekly Project Design Team meetings.
- Review exiting reports and project designs to identify additional environmental, historical and paleontological investigation needs based on each project's specific requirement.
- Develop an environmental approval schedule identifying work elements, additional studies/investigations, regulatory approval timelines, and risks for the entire flood mitigation program.
- Collaborate with Project Consultant Teams on regulatory submissions.
- Work with Design Team on preparing and submitting Regulatory approval packages.
- Liaise and main point of contact for regulatory agencies related to all DRFM projects.
- Maintain regular communications and project updates to regulatory agencies including:
 - Department of Fisheries and Oceans Canada
 - Navigable Waters, Transport Canada
 - Alberta Environment and Parks
 - Alberta Culture, Multiculturalism and Status of Women
- Support indigenous consultation where required
- Liaise with Alchemy Communications (Project Communications Lead) on public engagement and communications strategies.
- Provide historical and paleontological services including:
 - Review existing historical resource and paleontological information and preliminary approval from Heritage Division, Alberta Culture and Status of Women.
 - Review historical and existing geotechnical/drilling and land use information for each project area.
 - Develop Historic Resource Impact Assessment (HRIA) approaches and rationale for each project area based on schedule and previously disturbed and undisturbed project areas to minimize the need for additional field investigation.
 - Obtain permits under *Historical Resources Act* for proposed field investigations.
 - Submit Historical Resources Impact Assessment (HIRA) as required under the *Historical Resources Act*.
- Design tree inventory and health assessment GIS database to support vegetation clearing and tree replacement strategy.
- To facilitate construction, the Town may choose to undertake pre-clearing of project areas. Tree clearing support to include bird and wildlife sweeps, tendering, and construction supervision.

Construction Services

- Reviewing contractor environmental management (i.e. ECO) plans.
- Monitoring contractor work procedures and documentation.
- Part time quality assurance construction inspection services.
- Post construction and warranty inspections and monitoring.
- Preparation and submission of post construction reporting.

4. EVALUATION CRITERIA AND WEIGHTING

Proposals meeting the mandatory requirements will be evaluated.

Evaluation of Proposals

Each Proposal received will be evaluated on the basis listed below. The Town of Drumheller will have the sole and unfettered discretion to award up to the maximum number of points for each criterion listed below.

By submitting a Proposal, each Proponent acknowledges and agrees to waive any right to contest through legal proceedings. The decision to award points in respect to the criteria noted below will be at the sole discretion of the Town of Drumheller.

CRITERIA	WEIGHTING
Project Understanding	25 %
Key Staff and Qualifications	25 %
Relevant Project Experience	25 %
Cost	20 %
Proposal Completeness and Organization	5 %

The Proponent's responses to these technical requirements will be evaluated using a rating scale of 0 to 5. The rating will then be multiplied by the weighting as specified in the chart above. Each weighted score will be added to arrive at a total score. This scoring will assist the committee in evaluating the proposal but will not be the sole method of evaluation or selection.

The fees /salary evaluation will be calculated by taking the lowest Proposal Price divided by each other Proponents Proposal Price. The calculated point for each proposal will then be multiplied by the weight indicated in the Evaluation Criteria and Weighting table.

RATING	EXPLANATION
5 -Excellent	Exceeds Requirement/Adds Value
4 - Above Average	Exceeds Minimum Requirements
3 - Average	Meets Minimum Requirements

2 - Below Average	Falls Short of Expectations. Lacking Innovation
1 - Poor	Falls to Meet Minimum Requirements
0 - Non-Responsive	Did Not Attempt to Address Requirement

Proposal Feedback

All unsuccessful Proponents will be notified within two (2) business days after contract award.

Communication

Proponents or bidders are required to ensure that no communication is made by the Proponent or its representatives, including a third-party representative employed or retained by it, to promote or oppose any Proposal, make any public announcement, or communicate with any news media in any way unless such communication has first been approved by the Town.

Proposal Submission Form

The Proponents will complete the Proposal Submission Form provided in Schedule A and include a signed copy with the Proposal. In case of an incomplete or conditional Proposal, the Proponent will list the exceptions for a non-conforming proposal bid on a separate document and include in the Proposal.

SCHEDULE A

PROPOSAL SUBMISSION FORM

**“Flood Mitigation - Environmental Management Services
TOD RFP 2022-02-01”**

PROPOSALS THAT ARE UNSIGNED, INCOMPLETE, CONDITIONAL, ILLEGIBLE, OBSCURE, CONTAIN ARITHMETICAL ERRORS, ERASURES, ALTERATIONS OR IRREGULARITIES OF ANY KIND, MAY BE CONSIDERED INVALID.

THE LOWEST, OR ANY EVALUATED PROPOSAL, MAY NOT NECESSARILY BE ACCEPTED. THE TOWN OF DRUMHELLER RESERVES THE RIGHT TO REJECT ANY OR ALL PROPOSALS, OR TO ACCEPT THE PROPOSAL EVALUATED TO BE IN THE BEST INTEREST OF THE TOWN OF DRUMHELLER.

INTENT

THE UNDERSIGNED PROPONENT HEREBY PROVIDES THE ATTACHED PROPOSAL TO PERFORM THE PROJECT/WORK AS DESCRIBED SUBJECT TO ACCEPTANCE AND SUCCESSFUL NEGOTIATION OF A CONTRACT SUITABLE TO THE TOWN OF DRUMHELLER

PROponent:

PRINT NAME OF AUTHORIZED REPRESENTATIVE:

SIGNATURE: _____

DATE: _____

EMAIL: _____

TELEPHONE: _____

SCHEDULE B

“Flood Mitigation -Environmental Management Services
TOD RFP 2022-02-01”

December 24, 2020 Alberta Environment Water Act Application

January 29, 2021 Water Act Approvals Presentation

October 20, 2020 Historical Resources Act Requirement



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December 24, 2020

Alberta Environment and Parks
3rd fl Provincial Building
4920 - 51 Street
Red Deer, Alberta T4N 6K8

Dear Todd Aasen, Approvals Manager:

RE: Water Act Application for Drumheller Resiliency and Flood Mitigation Program

Introduction

The Town of Drumheller, situated in the Red Deer River valley is rich in geological and paleontological history but has also historically been prone to flooding. Much of the communities of Nacmine, Midland, Newcastle, North Drumheller, Central Drumheller, Rosedale, Cambria, Lehigh, and East Coulee are located within flood risk areas. Major floods have occurred in the past in 1902, 1915, 1932, 1954, 1991, 2005, 2013, and 2018. While some of the communities in Drumheller have existing flood mitigation infrastructure, additional work is needed to improve upon Drumheller's level of flood mitigation and resiliency.

To this end, the Town has secured \$55M in funding through the Government of Canada's Disaster Mitigation and Adaptation Fund, the Government of Alberta Community Resiliency Program, and from the Town, and has established the Drumheller Resiliency and Flood Mitigation Office (DRFMO) to administer the funding and manage the Drumheller Resiliency and Flood Mitigation Program (DRFM Program) through to its completion in 2024.

This letter is to advise Alberta Environment and Parks (AEP) of the upcoming work under the DRFM Program, to solicit feedback on the design criteria and approach for the projects, to obtain a Water Act approval in principle for the work under the DRFM Program (with detailed update submissions to follow once design has been completed) as well as to open the lines of dialogue AEP and the DRFMO for this important work so that it may be delivered smoothly in the coming four years.

Project Locations

The DRFM Program will consist of several individual projects to upgrade and extend existing dikes, design and construct new dikes and floodwalls, and implement riverbank erosion protection. The projects are located throughout the Drumheller Valley and within the municipal limits of the Town of Drumheller. The projects are located within the *Red Deer River Corridor Integrated Management Plan* area (GoA, 2000).

**Projects Located in
Alberta Townships:**
Twp29-Rge20-W4
Twp28-Rge19-W4
Twp27-Rge18-W4

The intent of the DRFMO is to secure any land on which the projects are to be completed if the land is not already Crown-owned. Work on land assembly is already underway, as discussed in the *Studies and Work Completed to Date* section of this letter.

This project is funded in part by the Government of Canada.



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**Mapped,
Impacted
Waterbodies:**
Red Deer River
Rosebud River
Michichi Creek

These projects will take place along the mapped water bodies of: Red Deer River, Rosebud River, and Michichi Creek, within Townships 27, 28 and 29. According to the Alberta Water Act – Code of Practice for Watercourse Crossings, the Red Deer River is a Class C watercourse. The Rosebud River and Michichi Creek are also noted to be Class C watercourses (AEP, 2006). The attached Figures 0 to 7 show the specific project locations relative to each waterbody. The Restricted Activity period for the Red Deer River is April 16 to June 30, and the Michichi Creek and Rosebud River Restricted Activity Period is April 16 to July 15.

DRFM Program – Proposed Projects

As previously mentioned, the projects under the DRFM Program will include work on existing dikes, constructing new dikes, and riverbank erosion protection. The following are the projects included in each of these categories.

Existing dikes to be raised and extended:

- 2. West and Central Midland Dike
- 3. East Midland Dike
- 4. West and East Newcastle Dike
- 5. Hospital Dike
- 6. North Drumheller Dike B
- 6. North Drumheller Dike C
- 7. Central Drumheller Dike D
- Rosedale Dike
- 11. East Coulee Dike

New dikes to be designed and constructed:

- 1. Nacmine Dike (including Nacmine Creek Dikes)
- 4. Newcastle Dike (new portion)
- 5. West Michichi Creek Dike A
- 7. Central Drumheller Dike D (new portion)
- 8. Willow Estates Dike
- 9. East Rosedale Dike
- 10. Lehigh Dike
- 11. East Coulee Dike (new portion)

Bank erosion protection to be installed:

- Hospital Dike
- Newcastle Dike
- West Newcastle Dike
- East Coulee
- Nacmine
- Midland Dike
- Drumheller
- Central Drumheller Dike D
- Rosedale
- Rosebud River
- Wayne
- Lehigh

For the locations of the above listed projects, please refer to the attached Figures 0 to 8. The projects under the DRFM Program are still in the feasibility stage, with design work beginning in early January 2021, and detailed update information submissions anticipated in May 2021. Further details of the DRFM Program's schedule are provided in the *DRFM Program Schedule* section of this letter.

Upon completion of the flood mitigation works under the DRFM Program, the Town of Drumheller will take over ownership and be responsible for on-going inspection and maintenance of the infrastructure.

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Studies and Work Completed to Date

The DRFM Program has been on-going since the fall of 2019, and several steps in moving the Program forward have already been completed or are underway. The list below outlines the work to date.

- Newcastle Beach – Brush Clearing for River and Creek Channel Conveyance Capacity completed March 2020 (AEP Water Act Approval #5048640)
- Newcastle Beach - Sand Bar Trimming for River Channel Conveyance Capacity Improvements completed April 2020 (AEP Water Act Approval #5049245)
- Project Land Assembly for flood mitigation projects (2019 – ongoing)
- First Nations Consultation, FCN # FNC202006286 (2019 – ongoing)
- Rewrites to the Municipal Development Plan (MDP) and Land Use Bylaw (LUB) to incorporate the flood mitigation and resiliency context were completed from May to December 2020 and the updated MDP and LUB were passed by Council on December 7, 2020.
- Environmental Assessments:
 - Three fish and fish habitat assessments were completed for the DRFM Office in the fall of 2020, dividing the Program area into two study reaches, as noted below. These three studies identified potential effects of the flood mitigation projects on the aquatic environments and recommend mitigation strategies to reduce the effects. The reports will be used throughout the design and construction of the projects.
 - Klohn Crippen Berger Ltd. (KCB, 2020 (1)) over an approximately 14 km long reach of the Red Deer River from 55th Street to Willow Estates.
 - Wood Group (Wood, 2020 (1)) for Cambria, Lehigh and East Coulee.
 - Applied Aquatic Research Ltd. (AAR, 2020 (1)) over an approximately 4 km reach of the Red Deer River at Nacmine and North Drumheller, and a 1.2 km reach of the Rosebud River.
 - Four terrestrial vegetation and wildlife habitat assessments have been completed for the DRFM Office in the fall of 2020, dividing the Program area into four study reaches, as noted below. These four studies identified potential effects of the flood mitigation projects on terrestrial plants and wildlife and recommend mitigation strategies to reduce the effects. The four reports will be used throughout the design and construction of the projects.
 - KCB, 2020 (2) for project areas within Midland, Newcastle, Centennial Park (Central Drumheller) and Willow Estates.
 - Ghostpine Environmental Services Ltd. (Ghostpine, 2020) for the abandoned CN Rail Line running from Midland to Wayne.
 - Wood, 2020 (2) for project areas within Cambria, Lehigh and East Coulee.
 - AAR, 2020 (2, 3) for project areas within Nacmine, North Drumheller, Rosedale, Hoodoo Trail, and Wayne Valley.

A high-level summary of the potential impacts identified and the associated mitigations for each impact are provided in the attached *Table A3: Construction Timing Considerations and Mitigation Strategies Summary*. Additionally, on-site monitoring by qualified professionals will be implemented during the construction phase of the work.

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- Desktop studies have been completed for paleontological and historic resources within the DRFM Program area, along with a Historical Resources Act (HRA) submission. The HRA Requirements were provided to the DRFMO in October 2020 (HRA Number: 4956-20-0069-001). Further work required includes a Historic Resources Impact Assessment (HRIA) by a qualified archeologist. This work will be undertaken in the coming months.

In addition to the list of completed studies and regulatory applications, it is anticipated that other approvals may be required from the following regulatory bodies. These applications will be prepared and submitted in the coming months.

- Transport Canada – Navigable Waters
- Fisheries and Oceans Canada – Self Assessment and Requests for Review

As the DRFM Program flood mitigation and resiliency projects were contemplated during the MDP and LUB update and have been incorporated into the new plan and bylaw, municipal approval will not be required for the work.

Design Criteria for Flood Mitigation Projects

The DRFMO has compiled summary tables to provide design guidance to the engineering firms who will be undertaking the projects' design in the coming months. These two tables are attached to this letter (Table A1, Table A2). By providing guiding design criteria for the upcoming flood mitigation projects, will ensure that the work is completed as much as practically possible, to the same standard, using the same background data set, a consistent set of flow rates, the same supporting hydraulic model (NHC, 2020 (2)) the same environmental assessment study data. This approach will facilitate project review by AEP and other regulatory agencies.

The construction timing considerations and the recommended construction practices summarized in this table are to mitigate impacts to fish, fish habitat, wildlife and terrestrial vegetation, based on the project's Environmental Assessment studies completed to date, are summarized in the attached Table A3.

The DRFMO welcomes any early comments and discussion on the information provided in the attached tables, ideally before the project design work kicks-off.

DRFM Program Schedule

As noted, the DRFM Program commenced in the fall of 2019 and is scheduled to wrap up in 2024. Key dates for the upcoming flood mitigation project work in the next year, including timeline for the submission of detailed project updates under the Water Act, are outlined in Table 1.

Table 1: DRFM Program Key Dates

Item	Timeline
Flood Mitigation Design Projects Award	Mid-January 2021
Preliminary Design Reports Completion	April 30, 2021
Detailed Approvals Update Submissions	May 2021
Flood Mitigation Project Construction Tendering	July 2021
Flood Mitigation Project Award	August 2021
Flood Mitigation Project Construction	Sept. 2021 to Nov. 2022

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Key dates for construction activities timing – including the in-stream work Restricted Activity Period, and the least risk windows for wildlife are included in the attached *Table A3: Construction Timing Considerations and Mitigation Strategies Summary*.

Closing

Based on the information contained in this letter and attachments, the DRFMO requests provisional Water Act approval for the projects under the DRFM Program. Detailed project updates will be provided to AEP in the coming months as the design work progresses, well before the planned construction start date.

Should you have any questions on the DRFMO's upcoming work, please feel free to contact me at 403-875-1456, or by email at Darwin.Durnie@drmpprogram.com

Yours truly,

DRUMHELLER RESILIENCY AND FLOOD MITIGATION OFFICE

Darwin Durnie
Chief Resiliency and Flood Mitigation Officer

Encl:

Project Location Figures 0 – 8

Table A1: Dike Design Criteria Summary Table

Table A2: Bank Erosion Protection Design Criteria Summary Table

Table A3: Construction Timing Considerations and Mitigation Strategies Summary Table

Table A4: Water Act – Flood Control Application: OneStop Submission Information Summary

This project is funded in part by the Government of Canada.



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Wood, 2020 (1). Aquatic Environment Assessment Rosedale, Cambria, Lehigh and East Coulee – Drumheller Flood Mitigation – Draft. Report Prepared for Drumheller Resiliency and Flood Mitigation Office, November 2020.

Wood, 2020 (2). Terrestrial Assessment Cambria, Lehigh and East Coulee – Drumheller Flood Mitigation. Report Prepared for Drumheller Resiliency and Flood Mitigation Office, December 2020.

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Table A1 provides a summary of the Drumheller Resiliency and Flood Mitigation Office's (DRFMO) preferred design criteria for the planned dike upgrades and new dike construction.

Table A1. Dike Design Criteria Summary

Parameter	Design Criteria	Source	Rationale
Red Deer River design flow	1,850 m ³ /s	NHC, 2020	<ul style="list-style-type: none"> 1:100-year regulated peak instantaneous discharge 1:100 year flood is regulatory flood in Alberta
Kneehills Creek design flow	186 m ³ /s	NHC, 2020	<ul style="list-style-type: none"> 1:100-year peak instantaneous discharge
Michichi Creek design flow	68 m ³ /s	NHC, 2020	<ul style="list-style-type: none"> 1:100-year peak instantaneous discharge
Rosebud River design flow	292 m ³ /s	NHC, 2020	<ul style="list-style-type: none"> 1:100-year peak instantaneous discharge
Willow Creek design flow	41 m ³ /s	NHC, 2020	<ul style="list-style-type: none"> 1:100-year peak instantaneous discharge
Design water levels	As per 2020 NHC HEC RAS model, including encroachment for dike	NHC, 2020	<ul style="list-style-type: none"> NHC 2020 model is the most up to date hydraulic model for the project area
Dike freeboard	0.75 m	DRFMO	<ul style="list-style-type: none"> Preferred minimum standard to account for: waves, water surface super-elevation, hydraulic model level of accuracy, local stormwater inflow on top of design flow, channel deposition during flood event, debris and future climate change
Climate change factor	Included in enhanced dike freeboard	DRFMO	<ul style="list-style-type: none"> Allows for future increase in design flow due to climate change
Dike top width	6 m	DRFMO	<ul style="list-style-type: none"> Preferred minimum standard Allows room for temporary dike raise and pathway on crest on an emergency basis

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Parameter	Design Criteria	Source	Rationale
Side slopes	3H:1V	DRFMO	<ul style="list-style-type: none"> Preferred minimum standard BC Dikes Design BMP– minimum slope typically 3H:1V; no steeper than 2.5H:1V to allow for mowing/maintenance
Minimum setback from top of bank	5 m	BC Dikes Design BMP	<ul style="list-style-type: none"> Preferred minimum, allows for riverside riparian vegetation buffer, room for bank erosion/movement <i>It may not always be possible should include site-specific assessment</i>
Dike alignment radius of curvature	15 m	BC Dikes Design BMP	<ul style="list-style-type: none"> Preferred minimum standard Allows for efficient access of most heavy equipment
Erosion protection	Refer to Table A2		
Stormwater cross drain design flow	Match Town of Drumheller Major System design flow of 1:100-year rainfall event	Town of Drumheller Utility Engineering Standards	<ul style="list-style-type: none"> Prevent surcharging of existing stormwater system
Natural drainage channel side dikes design flood elevation	Match Red Deer River flood elevation + freeboard	NHC, 2020	<ul style="list-style-type: none"> Preferred minimum standard Mitigates back-flow flooding while allowing for free drainage of channel
Dike access ramps	Maximum slope 10% Minimum width 4 m Recommend 1 every 2 km	BC Dikes Design BMP	<ul style="list-style-type: none"> Preferred minimum standard Allows for efficient access of most heavy equipment
Dike turnouts	Provided every 300 to 500 m, where access ramps not available Provide an extra 6 m width over 20 m length	BC Dikes Design BMP	<ul style="list-style-type: none"> Preferred minimum standard Allows for vehicles to pass on dike crest and room for vehicles to turn around

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Parameter	Design Criteria	Source	Rationale
Dike footprint land ownership	Land assembly underway for flood mitigation works, wherever possible, land to be owned by Town or public land Alberta Environment owned dikes to be transferred to Town of Drumheller along with land interest	DRFMO	<ul style="list-style-type: none">To facilitate dike maintenance and mitigate private landowner interference
Utilities	Avoid placement of utilities in the dike footprint (with the exception of stormwater cross drains)	Best practice	<ul style="list-style-type: none">Reduces potential for seepage and settlement and inadvertent interference with dike impervious core

References:

Northwest Hydraulic Consultants, 2020. Drumheller River Hazard Study: Hydraulic Modelling and Flood Inundation Mapping Report. Report Prepared for Alberta Environment and Parks, April 2020.

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Table A2 below indicates the Drumheller Resiliency and Flood Mitigation Office's (DRFMO) preferred design criteria for the project areas where erosion protection is recommended, as shown in Figures 1 to 7. The determination of areas requiring bank erosion protection was made by examining the NHC 2020 Channel Stability Report combined with site inspections on planned flood mitigation locations by DRFMO team members.

Table A2: Bank Erosion Protection Design Criteria Summary

Parameter	Design Criteria	Source	Rationale
Design Flow	<ul style="list-style-type: none"> 1:100 year flood, refer to Table A1 	NHC, 2020	<ul style="list-style-type: none"> Industry-standard practice
Materials	<ul style="list-style-type: none"> Combination of hard armour and bioengineering (typ. hard armour to 1:5 year for flood and ice; bioengineering above) Minimum slope for riprap placement is 2H:1V 	Ghostpine, 2020 KCB, 2020	<ul style="list-style-type: none"> Minimizes impacts to fish and fish habitat and wildlife corridors Inclusion of bioengineering improves river bank aesthetics for river users and park users
Toe Scour	<ul style="list-style-type: none"> Design for calculated maximum scour plus safety factor 		<ul style="list-style-type: none"> Protect against ice and flood scour of bed and bank

References:

Ghostpine, 2020. Terrestrial Vegetation and Wildlife Assessment/Inspection Report: CN Rail Line. Report Prepared for Drumheller Resiliency and Flood Mitigation Office, December 2020.

Klohn Crippen Berger, 2020 (1). Drumheller Resiliency and Flood Mitigation Project Fish and Fish Habitat Assessment. Report Prepared for Drumheller Resiliency and Flood Mitigation Office, December 2020.

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Table A3 provides a high-level summary of measures identified to mitigate the potential impacts for flood infrastructure construction on both aquatic and terrestrial environments. For further details on impacts and mitigations, refer to the environmental assessment summary report for each specific project area, listed in the *References* section below the table. In addition to implementing the mitigations listed below, the Drumheller Resiliency and Flood Mitigation Office (DRFMO) also plans to implement on-site environmental monitoring during construction, with the range of professionals required on-site dictated by the specific work, potential impacts identified and the location of the project.

Table A3: Construction Timing Considerations and Mitigation Strategies Summary

Parameter	Measures to minimize impacts	Source
In-stream work practices		
In stream work - Restricted Activity Period (RAP)	In stream work shall observe the applicable RAP: <ul style="list-style-type: none"> - Red Deer River: Apr 16 – Jun 30; - Kneehills Creek: Apr 16 – Jul 15; - Michichi Creek: Apr 16 – Jul 15; - Rosebud River: Apr 16 – Jul 15; and - Willow River: Apr 16 – Jul 15. 	Code of Practice for Watercourse Crossings: Brooks Management Area (GoA, 2006)
Practices to minimize effects to fish and fish habitat	Avoid direct changes and effects to identified spawning and overwintering areas. Minimize encroachment into river channel below the ordinary high-water mark (1:2 year flood). Minimize disturbance to riparian vegetation and revegetate areas where disturbance is unavoidable; revegetation should include appropriate species (e.g., grasses, willows, etc.) for the regional area and site conditions. Permanent riparian and in-stream footprints are to include fish habitat considerations within their design (e.g., bioengineering, etc.) to minimize the loss of fish habitat. Undertake compensation measures where effects are unavoidable; compensation measures will endeavor to create habitat beneficial to local fish species by promoting locally limited fish habitat (e.g., spawning areas, overwintering areas, etc.). For construction below high-water mark, isolate work area to prevent sediment release into	Ghostpine, 2020 KCB, 2020 (1) Wood, 2020 (1) AAR, 2020 (1)

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Parameter	Measures to minimize impacts	Source
	<p>watercourse; fish rescues to be conducted within isolation areas; isolation areas to be less than 1/3 of channel width; all in-stream works are to be completed as quickly as possible.</p> <p>If dewatering of the isolated areas is required, appropriately sized end-of-pipe screens will be used.</p> <p>If diversion of river flows is required, appropriately sized end-of-pipe screens will be used.</p> <p>The services of an on-site QAES will be retained during construction within riparian areas and below the ordinary high-water mark to monitor during work (e.g., turbidity, total suspended solids [TSS], etc.).</p> <p>Equipment working within riparian areas and below the ordinary high-water mark will be operated with environmentally friendly and biodegradable hydraulic fluids and lubricants.</p> <p>Suspend construction work during periods of snow melt and/or heavy precipitation.</p> <p>Refueling will only occur within designated locations away from the watercourse.</p> <p>Hazardous materials will be stored in secondary containment away from the watercourse.</p> <p>Site specific temporary and permanent sediment and erosion control plans are to be developed and implemented.</p> <p>Develop spill contingency plan and have spill kits readily accessible on site; spill kits are to be appropriately sized and equipped for the on-site machinery and potential release environment (e.g., large flowing river, etc.).</p>	
<p>Practices to prevent spread of Whirling Disease and Aquatic Invasive Species</p>	<p>All equipment working within riparian areas and below the high-water mark must be cleaned in compliance with AEP's <i>Decontamination Protocol for Work in or Near Water</i>.</p>	<p>Ghostpine, 2020 KCB, 2020 (1) Wood, 2020 (1)</p>

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Parameter	Measures to minimize impacts	Source
	<p>All equipment working within riparian areas and below the high-water mark must arrive on-site clean and be cleaned at an appropriate facility immediately after leaving the site; decontamination efforts shall be recorded as per AEP's <i>Decontamination Record Template</i>.</p> <p>The onsite QAES and/or Environmental Inspector will inspect machinery and decontamination records for compliance.</p>	AAR, 2020 (1)
Terrestrial Work Practices		
Lowest risk construction window for migratory birds (breeding)	<p>Approximately September 1 to early/mid-April</p> <p>Note: there are AEP recommended setback distances and timing constraints for low, medium, and high-risk activities for nests of sensitive migratory bird species (ASRD 2011); GOA 2018 provides setbacks, Standards/Conditions associated with nest sites for activities on crown land.</p>	<p>Ghostpine, 2020</p> <p>KCB, 2020</p> <p>Wood, 2020 (1)</p> <p>AAR, 2020 (3)</p> <p>Government of Canada, 2018</p> <p>ASRD, 2011</p> <p>GOA, 2018</p>
Lowest risk construction window inclusive of both Forest Nesting Owls and other Raptors (Breeding)	<p>Approximately September 1 to early February (for earliest nesting owl/ raptor species)</p> <p>Approximately September 1 to early March (for hawk /forest-nesting owl species)</p> <p>Note: there are AEP recommended setback distances as well as timing constraints for low, medium, and high-risk activities for nests of sensitive raptor species (ASRD 2011); GOA 2018 provides setbacks, Standards/Conditions associated with raptor nest sites for activities on crown land.</p>	<p>KCB, 2020</p> <p>Ghostpine, 2020</p> <p>AAR, 2020 (3)</p> <p>Government of Alberta, 2013</p> <p>ASRD, 2011</p> <p>GOA, 2018</p>
Lowest risk construction window for Burrowing owl (Breeding/Dispersal)	<p>Approximately October 16 to March 31 (for Low or Medium disturbance activities (ASRD 2011))</p> <p>Note: there are year-round AEP recommended setback distances as well as timing constraints for low, medium, and high-risk activities for nests/dens of burrowing owls (ASRD 2011); GOA 2018 provides setbacks, Standards/Conditions associated with</p>	<p>AAR, 2020 (3)</p> <p>Government of Alberta, 2013</p> <p>ASRD, 2011</p> <p>GOA, 2018</p>

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Parameter	Measures to minimize impacts	Source
	burrowing owls' nests/dens for activities on crown land.	
Lowest risk construction window for Sharp-tailed Grouse (Breeding/lekking)	<p>Approximately September 1 to early/mid-March (breeding)</p> <p>Approximately June 16 to March 14 (leks) (for Low or Medium disturbance activities (ASRD 2011))</p> <p>Note: there are year-round AEP recommended setback distances as well as timing constraints for low, medium and high-risk activities for sharp-tailed grouse leks (ASRD 2011); GOA 2018 provides setbacks, Standards/Conditions associated with sharp-tailed grouse lek and nest sites for activities on crown land.</p>	<p>KCB, 2020</p> <p>AAR, 2020 (3)</p> <p>Government of Alberta, 2013</p> <p>ASRD, 2011</p> <p>GOA, 2018</p>
Lowest risk construction window for mammals in riparian habitats, including Bats (Breeding)	<p>Approximately September 1 to March 31</p> <p>GOA 2018 provides setbacks, Standards/Conditions associated with important wildlife features (i.e., den sites, mineral licks etc.) for activities on crown land.</p>	<p>KCB, 2020</p> <p>Ghostpine, 2020</p> <p>GOA, 2018</p>
Lowest risk construction window for amphibians (including Breeding/Hibernation)	<p>Approximately September 1 to March</p> <p>Note: there are AEP year-round recommended setback distances for low, medium and high-risk activities for breeding and hibernation sites of sensitive amphibian species (ASRD 2011); GOA 2018 provides setbacks, Standards/Conditions associated with amphibian breeding and hibernation sites for activities on crown land.</p>	<p>KCB, 2020</p> <p>Ghostpine, 2020</p> <p>Government of Alberta, 2013</p> <p>ASRD, 2011</p> <p>GOA, 2018</p>
Lowest risk construction window for snakes (including Breeding/Hibernation)	<p>Approximately June to September 30 (when snakes are away from hibernaculae)</p> <p>November 1 to March 14 (Rookery Sites) (for Low or Medium disturbance activities (ASRD 2011))</p> <p>Note: there are year-round AEP recommended setback distances as well as timing constraints for low, medium and high-risk activities for sensitive snake species hibernacula and rookeries (ASRD 2011); GOA 2018 provides</p>	<p>KCB, 2020</p> <p>Government of Alberta, 2013</p> <p>ASRD, 2011</p> <p>GOA, 2018</p>

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Parameter	Measures to minimize impacts	Source
	setbacks, Standards/Conditions for activities on crown land.	
Practices to minimize impacts to wildlife	<p>Limit project footprint; use previously disturbed areas when possible for temporary workspace or laydown; avoid disturbing sensitive habitats.</p> <p>Qualified biologists to conduct targeted wildlife surveys at an appropriate time of year to identify active wildlife breeding areas/residences; devise mitigation plans to avoid disturbance of these sites in consideration of government recommended setbacks and timing constraints and until breeding/rearing activities have ended.</p> <p>Qualified biologists to conduct pre-construction wildlife sweep within five to seven days prior to start of clearing/construction; buffer zones around active breeding areas/residences must be maintained until no longer considered active.</p> <p>Vegetation clearing to take place outside of migratory bird nesting and rearing period (approximately April 15 to August 31); earlier clearing (i.e., in fall or early winter) may be also warranted in areas with high potential for earlier nesting owls/raptors.</p> <p>QAES present on site for in-stream and bank work.</p> <p>If active wildlife breeding areas/residences protected under government legislation are discovered during construction, work will be postponed, and a qualified biologist will be contacted to recommend a species appropriate buffer zone.</p> <p>If snake hibernacula are found, signage will be installed in area to watch out for and avoid snakes.</p> <p>Minimize barriers to wildlife movement through project site, through design and construction.</p> <p>Limit number of construction vehicles on site and their speed.</p>	<p>AAR, 2020 (3)</p> <p>Ghostpine, 2020</p> <p>KCB, 2020</p> <p>Wood, 2020 (2)</p>

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Parameter	Measures to minimize impacts	Source
	<p>Minimize use of artificial lighting and turn it off when not in use.</p> <p>Remove all garbage from site daily.</p> <p>Wildlife will not be fed or harassed.</p>	
Practices to minimize impacts to rare plant species and communities	Conduct localized pre-construction rare plant surveys between early June to mid-August; develop mitigation measures based on survey results.	<p>AAR, 2020 (2)</p> <p>Wood, 2020 (2)</p> <p>Ghostpine, 2020</p> <p>KCB, 2020</p>
Practices to minimize vegetation/habitat loss	<p>Conduct localized pre-construction surveys between June to August to verify vegetation species composition and cover.</p> <p>Avoid complete grubbing of riparian vegetation shrub roots in riparian areas where vegetation regrowth is desired (i.e. - willows) or minimize clearing of shrubs/trees where possible.</p> <p>Protect trees/shrubs from adjacent clearing areas; avoid removal of large trees where feasible.</p> <p>Provide additional ground padding for high traffic areas (i.e., rig mats).</p> <p>Limit project footprint; use previously disturbed areas when possible for temporary workspace or laydown.</p> <p>Remove and destroy diseased wood immediately to prevent spread of Black Knot.</p> <p>Herbicides will not be used in ephemeral drainages and watercourses, and movement of herbicides into nearby drainages, watercourse, ditches, or other sensitive areas is to be avoided.</p> <p>When possible, work will be conducted during dry and/or frozen conditions to minimize impacts to vegetation (e.g., rutting).</p>	<p>KCB, 2020</p> <p>Wood, 2020 (2)</p> <p>Ghostpine, 2020</p>
Practices to minimize impacts to wetlands	Conduct wetland assessment.	<p>Ghostpine, 2020</p> <p>Wood, 2020 (2)</p>

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Parameter	Measures to minimize impacts	Source
	Develop wetland mitigation/reclamation strategy as required for regulatory applications for disturbance to wetlands.	
Practices to prevent introduction of invasive weeds	<p>Conduct localized weed survey between June to August at construction site and along equipment movement corridors.</p> <p>Contractors required to develop weed management plan as per Alberta <i>Weed Control Act</i> and <i>Weed Control Regulations</i>.</p> <p>Management of <i>Noxious</i> and <i>Prohibited Noxious</i> species must follow provincial weed control regulation.</p> <p>Equipment must be washed thoroughly prior to entering and exiting project area.</p> <p>Monitor soil stockpiles for evidence of growth of unwanted vegetation or weeds; control any Noxious or Prohibited Noxious weeds as per <i>Weed Control Act</i>.</p> <p>All plant material used for construction must be sourced from native species.</p> <p>Chemical application for weed control must be in compliance with Pesticide Regulation and Environmental Code of Practice for Pesticides.</p>	<p>AAR, 2020 (2)</p> <p>Ghostpine, 2020</p> <p>KCB, 2020</p> <p>Wood, 2020 (2)</p>
Site restoration practices	<p>Develop a restoration plan prior to construction that incorporates native vegetation.</p> <p>Reclaim, restore, and revegetate disturbed land within one growing season to minimize erosion.</p> <p>Use certified and weed-free seed mix for final reclamation and revegetation.</p> <p>Salvage topsoil and coarse woody debris from project footprint to use as reclamation material.</p> <p>Consider revegetating with plant species that create habitat opportunities for sensitive wildlife species.</p>	<p>Ghostpine, 2020</p> <p>KCB, 2020</p> <p>Wood, 2020 (2)</p> <p>AAR, 2020 (2)</p>
Erosion and sediment control	Erosion and sediment control plan & inspection requirements will be established.	<p>Ghostpine, 2020</p> <p>KCB, 2020</p>

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Parameter	Measures to minimize impacts	Source
	<p>Both final revegetation plan & temporary site plan are required.</p> <p>Stockpile materials away from watercourse and protect with erosion and sediment control measures.</p> <p>Use isolation structures and turbidity monitoring to reduce sediment release.</p> <p>Include strategies in plan to control erosion of replaced topsoil using silt fencing, erosion control matting, staked burlap rolls, willow staking, hydroseeding, etc.</p>	AAR, 2020 (1)

References:

Alberta Environment, 2006. Code of Practice for Watercourse Crossings – Brooks Management Area. Available: <https://open.alberta.ca/publications/2478000>

Applied Aquatic Research Ltd., 2020 (1). Fall Riverine Habitat Inventory of the Red Deer and Rosebud Rivers – Resiliency and Flood Mitigation Program – Draft. Report Prepared for Drumheller Resiliency and Flood Mitigation Office, October 2020.

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Ghostpine Environmental Services Ltd. (Ghostpine), 2020. Terrestrial Vegetation and Wildlife Assessment/Inspection Report: CN Rail Line. Report Prepared for Drumheller Resiliency and Flood Mitigation Office, December 2020.

Government of Alberta 2013. Sensitive Species Inventory Guidelines. April 2013. [Online]. Last updated October 29, 2015. Available from: <http://esrd.alberta.ca/fish-wildlife/wildlife-management/sensitive-species-inventory-guidelines>.

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Wood, 2020 (1). Aquatic Environment Assessment: Rosedale, Cambria, Lehigh and East Coulee – Drumheller Flood Mitigation – Draft. Report Prepared for Drumheller Resiliency and Flood Mitigation Office, November 2020.

Wood, 2020 (2). Terrestrial Assessment: Cambria, Lehigh and East Coulee – Drumheller Flood Mitigation. Report Prepared for Drumheller Resiliency and Flood Mitigation Office, December 2020.

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Table A4 below provides a summary of the required OneStop Submission requirements, where the information can be found in the current submission package or if it will be submitted at a later date with the detailed project update submissions.

Table A4: Water Act – Flood Control Application: OneStop Submission Information Summary

Item	Response	Further Information
General – Contact Info	Applicant: <i>Darwin Durnie, Chief Resiliency Officer Drumheller Resiliency and Flood Mitigation Office (on behalf of Town of Drumheller)</i> <i>Ph (403) 875-1456 Darwin.durnie@drmprogram.com</i> Applicant Representative: <i>Deighen Blakely, P. Eng. Kerr Wood Leidal Ph (403) 471-9783 dblakely@kwl.ca</i>	
General – Activity Details	Application Type: <i>Water Approval</i> Application Purpose: <i>Flood Control</i>	
Authorization - General Application: Upload Shapefile	<i>Location map attached to current Water Act Letter shows project locations</i>	<i>Project shapefiles to be submitted with detailed design update package in spring 2021</i>
Authorization - General Application: Activity Details	LLD: <i>Twp29-Rge20-W4 Twp28-Rge19-W4 Twp27-Rge18-W4</i>	<i>Detailed project locations for individual projects to be submitted with detailed design update package in spring 2021</i>
Authorization - General Application: Activity Details	The activity is located on: Crown Lands/Private Land Are there any other lands affected by the activity? Yes/No Provide written consent of directly affected land owner(s) <i>-attach file-</i> Attach Registered Land Title	<i>The intent of the DRFMO is to secure any land on which the projects are to be completed if the land is not already Crown-owned. This land will become Town of Drumheller owned.</i> <i>Further details on land assembly will be submitted with detailed design update package in spring 2021</i>

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RESILIENCY AND FLOOD MITIGATION OFFICE

DRUMHELLER
VALLEY

Item	Response	Further Information
	– attach file-	
Authorization - General Application: Activity Details	File Number for Consultation (First Nations Consultation): <i>FNC202006286</i> Consultation Status: Exempt/Not Required/ Required and Adequate /Required and Outstanding	<i>First Nations Consultation has been on-going since 2019.</i>
Authorization - General Application: Activity Details	Are there any existing Water Act authorizations to link to this application? Yes/No Authorization ID: <i>5048640</i> Authorization Type: <i>Water Approval – Flood Control</i>	<i>Previous authorization for works at Newcastle Beach</i>
Authorization - General Application: Activity Details	Has the work under this authorization been completed? Yes/No	
Authorization - General Application: Activity Details	Will this activity require maintenance? Yes/No	<i>Town of Drumheller will take over ownership of flood mitigation infrastructure and complete required inspection and maintenance</i>
Authorization - General Application: Activity Details	Proposed Activity Start Date: <i>Sep. 2021</i> Proposed Activity End Date: <i>Nov. 2022</i>	
Authorization - General Application: Activity Details	Activity Description: <i>The DRFM Program will consist of several individual projects to upgrade and extend existing dikes, design and construct new dikes and floodwalls, and implement riverbank erosion protection.</i>	<i>Refer to Water Act Letter dated Dec 24, 2020 for further details</i>
Authorization - General Application: Activity Details	Attach Supporting Documentation	<i>Refer to Water Act Letter dated Dec 24, 2020 for further details</i> <i>Environmental Assessment Reports available on request</i>

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Item	Response	Further Information
		<i>Design reports and drawings to be submitted with detailed design update package in spring 2021</i>
Authorization – Water Body	Impacted Water Body: <i>Red Deer River Rosebud River Michichi Creek</i>	
Authorization – Water Body	Does this activity impact wetlands? Yes/No	<i>Projects have potential to impact wetlands, further details to be submitted with detailed design update package in spring 2021</i>
Authorization – Additional Information: Upload Shapefile	Attach shapefile of flood control in .zip format: <i>Location map attached to current Water Act Letter shows project locations</i>	<i>Flood control shapefiles to be submitted with detailed design update package in spring 2021</i>
Authorization – Additional Information: Flood Control Water Approval	Is the Water Body Mapped? Yes/No Please Review the Relevant Management Area Map: <i>Brooks Management Area has been reviewed</i> What is the Class of Water Body? <i>C Moderate Sensitivity</i> Is there a Restricted Activity Period? Yes/No Start Date: <i>April 16 – all three watercourses</i> End Date: <i>June 30 – Red Deer River July 15 – Michichi Creek and Rosebud River</i>	
Authorization – Additional Information: Flood Control Water Approval	Does the proposed activity impact a lake? Yes/No	

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Item	Response	Further Information
<p>Authorization – Additional Information: Flood Control Water Approval</p>	<p>Will the proposed work have a potential impact to the aquatic environment? Yes/No</p> <p>Please Review the Fisheries & Wildlife Management Information System</p> <p><i>FWMIS was consulted during Environmental Impact Studies</i></p> <p>Attach Aquatic Environment Impact Assessment completed by a Qualified Aquatic Environmental Specialist</p> <p><i>See link for reports</i></p> <p>Name of Qualified Aquatic Environmental Specialist:</p> <ul style="list-style-type: none"> • <i>Applied Aquatic Research Ltd. – Thomas Boag, Senior Fish Biologist</i> • <i>Ghostpine Environmental Services Ltd. – Tyler Rae, Sr. Fisheries Biologist</i> • <i>Klohn Crippen Berger – Matthew Landgrebe, Aquatic Biologist</i> • <i>Wood – Michael Kovacs, Aquatic Biologist</i> <p>Professional Desingation of Qualified Aquatic Environmental Specialist:</p> <ul style="list-style-type: none"> • <i>Thomas Boag – P. Bio.</i> • <i>Tyler Rae – P. Bio</i> • <i>Matthew Landgrebe – P. Bio.</i> • <i>Michael Kovacs – P. Bio</i> 	<p><i>Environmental Assessment Reports available on request</i></p>
<p>Authorization – Additional Information: Flood Control Water Approval</p>	<p>Will the proposed activity have an impact on the water body upstream or downstream or adjacent to the proposed activity? Yes/No</p> <p>Will the proposed activity have an impact on the water body upstream or downstream or adjacent landowners? Yes/No</p>	<p><i>Impacts and mitigations are identified at a high level in the Program’s Environmental Assessment Reports</i></p> <p><i>Environmental Assessment Reports available on request</i></p> <p><i>A summary of mitigation is provided in Table A3.</i></p>

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Item	Response	Further Information
	<p>Is there potential for erosion or siltation during the proposed activity? Yes/No</p> <p>Are there permanent mitigation measures proposed for the potential impacts? Yes/No</p> <p>Have the proposed permanent mitigation measures been identified within a report submitted with this application? Yes/No</p> <p>Attach a detailed description of the proposed mitigation measures <i>-attach documents-</i></p>	<p><i>Further details on anticipated impacts and proposed mitigations to be submitted with detailed design update package in spring 2021</i></p>
Confirmation - Validations	<i>n/a</i>	
Confirmation - Overview	<i>n/a</i>	

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Water Act Approvals for Drumheller Resiliency and Flood Mitigation Program

January 29, 2021



Agenda

1. Introductions
2. Program overview presentation
3. Questions & discussion on program
4. Next steps for Water Act approvals
5. Closing

Introduction

- Drumheller is a flood community – past events in 1902, 1915, 1932, 1954, 1991, 2005, 2013 and 2018
- Drumheller has secured \$55M through Disaster Mitigation Adaptation Fund (DMAF) \$22M (Canada) \$28M (Alberta) \$5M (Town of Drumheller)
- Drumheller Resiliency and Flood Mitigation Office (DRFMO) established in 2019 deliver the DRFM Program through to its completion in 2024
- DRFMO Objectives:
 - Communication & Public Engagement
 - Regulatory/Approvals
 - Conveyance Capacity
 - Structural Measures
 - Municipal Emergency Plan

Project Types

DRFM Program includes three main types of work:

- Upgrading and extending existing dikes (9 projects)
- Designing and constructing new dikes (8 projects)
- Implementing riverbank erosion protection (12 projects)

Existing Provincial dikes - raised and extended:

2. West and Central Midland Dike
3. East Midland Dike
4. West and East Newcastle Dike
6. North Drumheller Dike B
6. North Drumheller Dike C
7. Central Drumheller Dike D
11. East Coulee Dike

New dikes:

1. Nacmine Dike (including Nacmine Creek Dikes)
 4. Newcastle Dike (new portion)
 5. West Michichi Creek Dike A
 7. Central Drumheller Dike D (new portion)
 8. Willow Estates Dike
 9. East Rosedale Dike
 10. Lehigh Dike
 11. East Coulee Dike (new portion)
- Rosedale (Scarlett) Dike

Bank erosion protection:

- Hospital Dike
- Newcastle Dike
- West Newcastle Dike
- East Coulee
- Nacmine
- Midland Dike
- Drumheller
- Central Drumheller Dike D
- Rosedale
- Rosebud River
- Wayne
- Lehigh



Project Locations

- Within Town of Drumheller municipal limits, along **Red Deer River, Rosebud River, and Michichi Creek**
- DRFMO intends to secure land for projects if not already Crown-owned
- Upon completion - Town of Drumheller will take over ownership, inspection and maintenance

Projects Located in Alberta Townships:
 Twp29-Rge20-W4
 Twp28-Rge19-W4
 Twp27-Rge18-W4

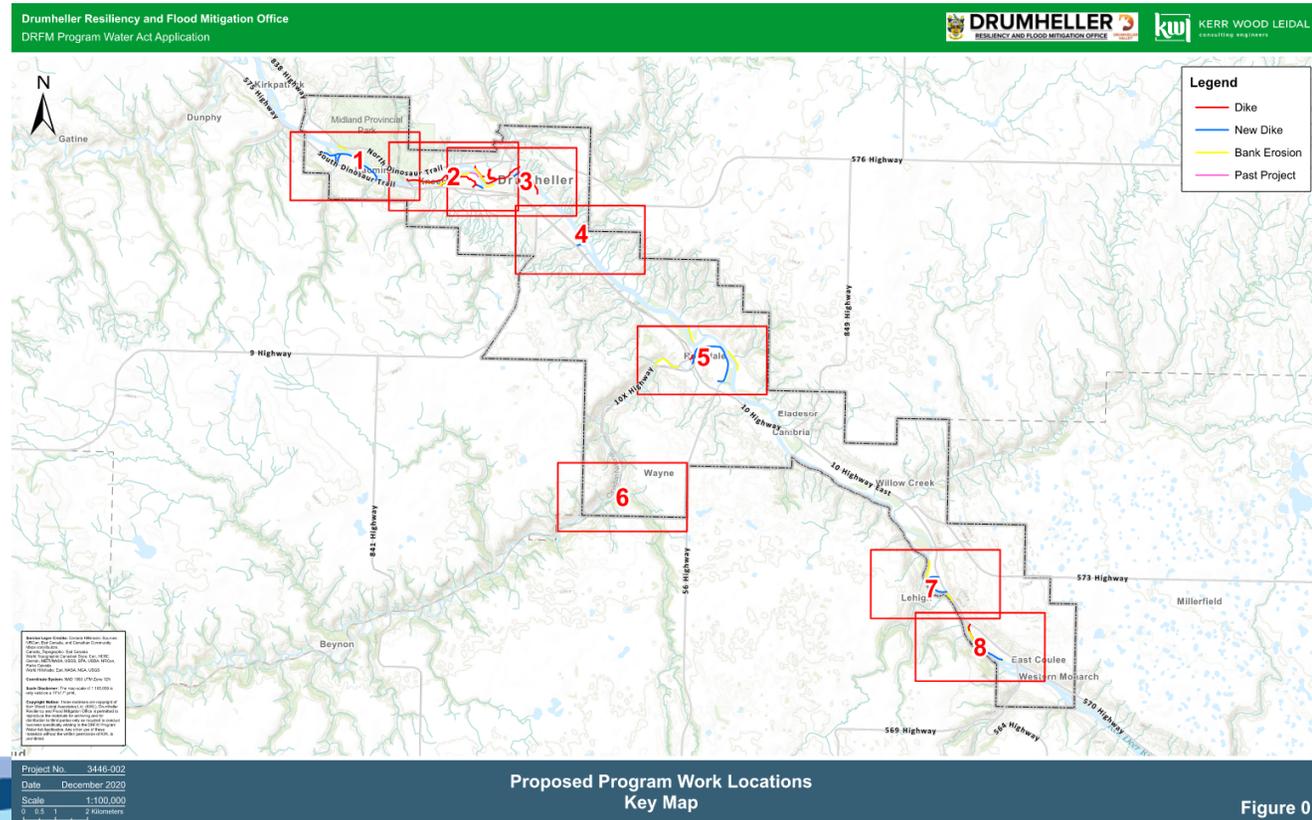
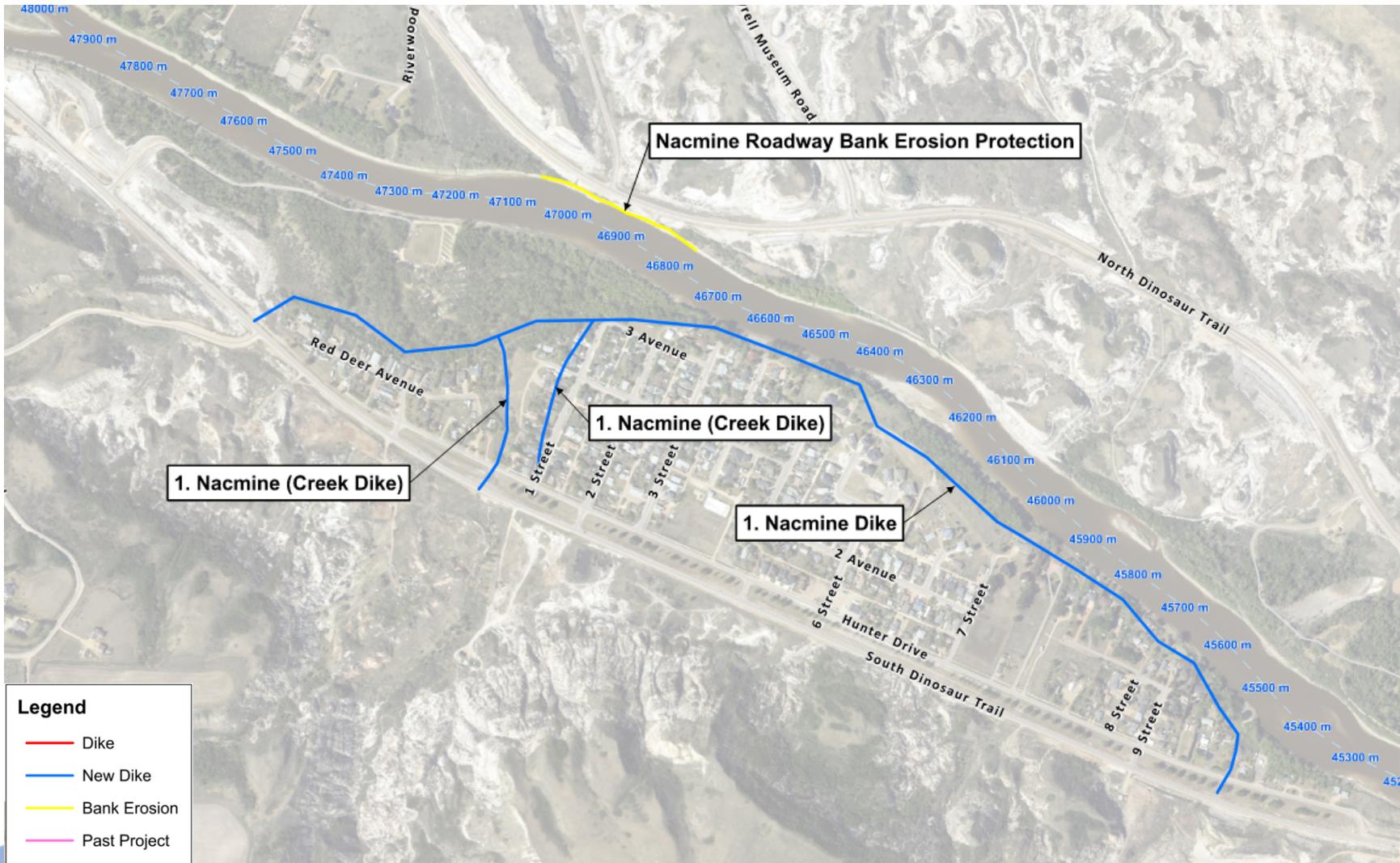
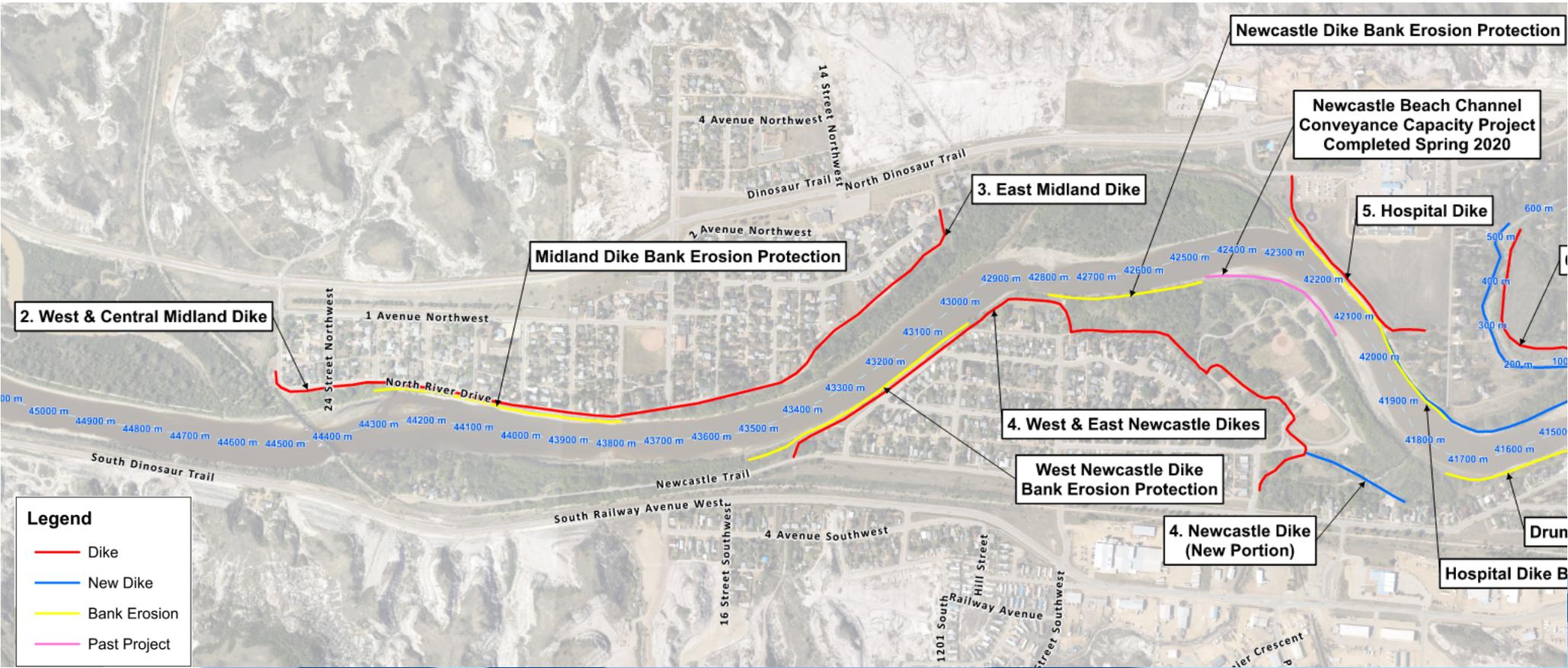


Figure 0

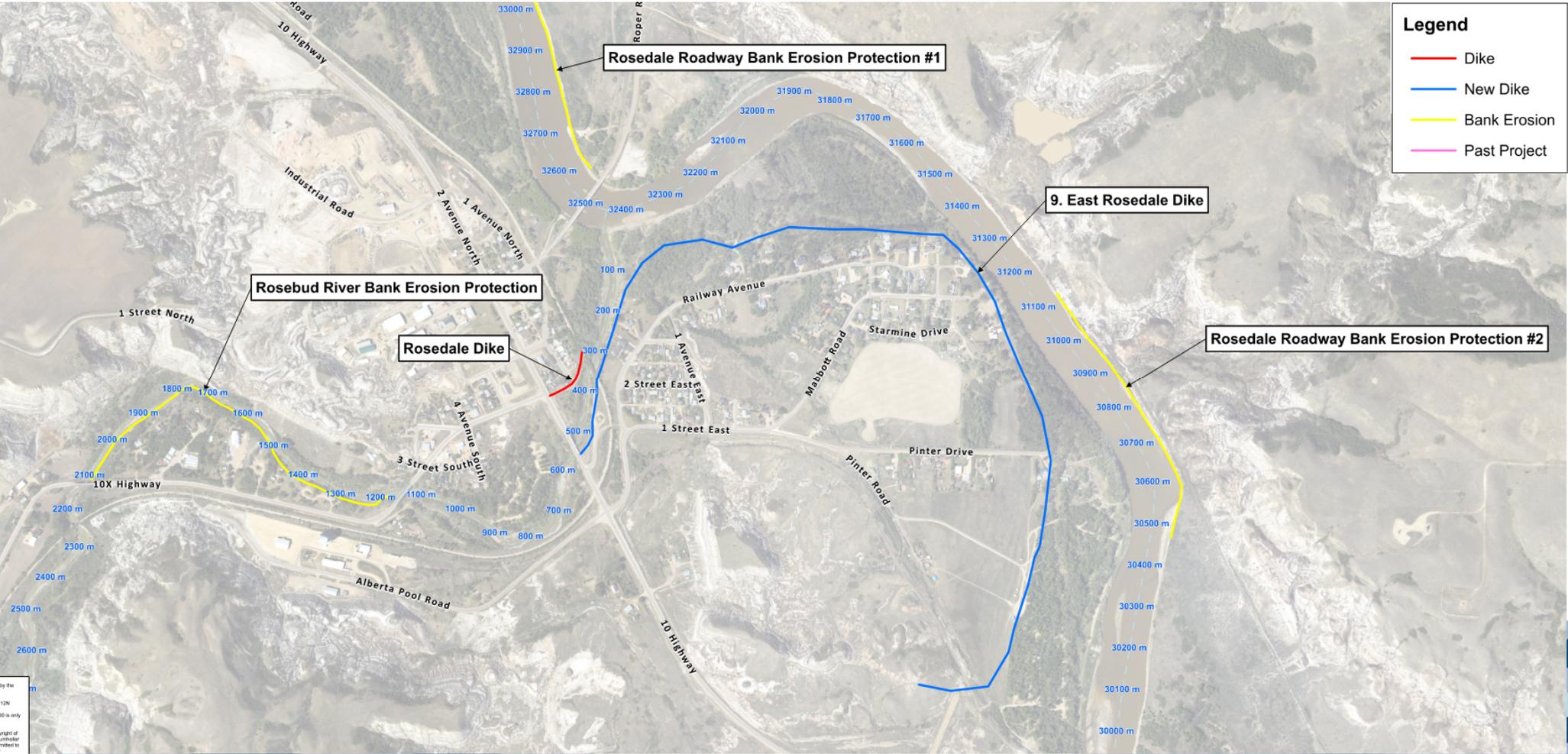




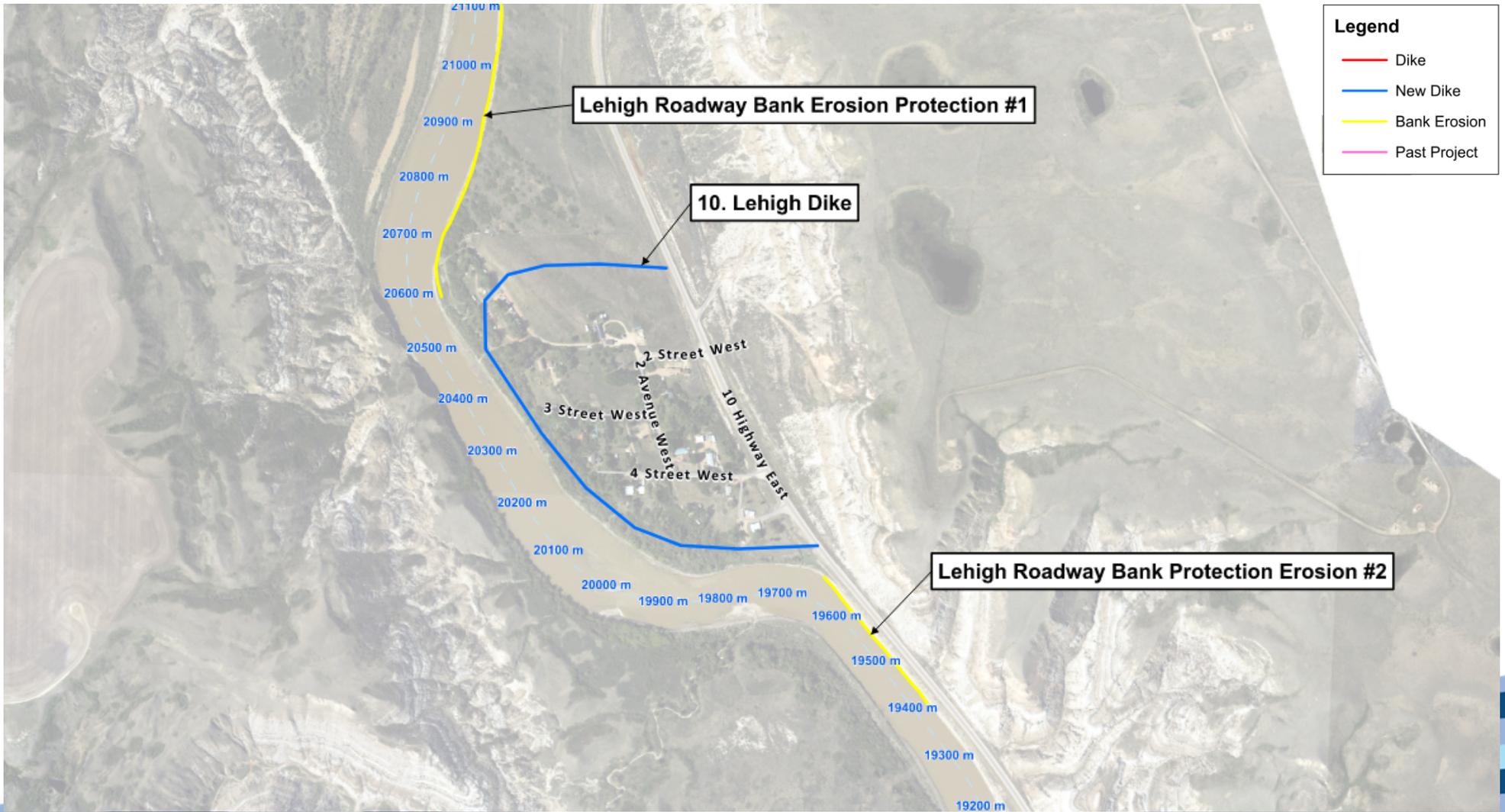


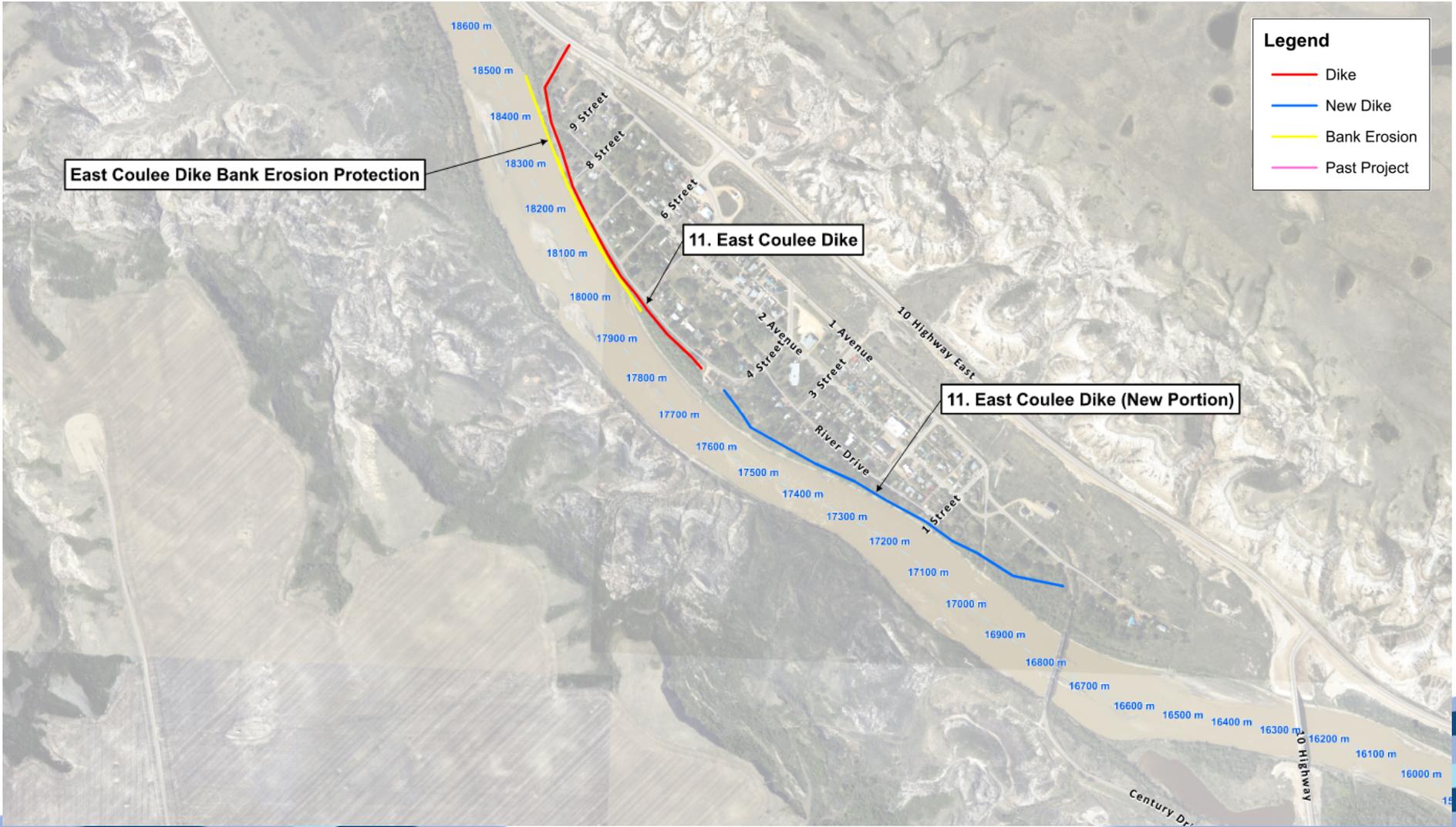
Legend

- Dike
- New Dike
- Bank Erosion
- Past Project









DRFM Program Schedule

- All DRFMO Program work will be completed by 2024
- Key project dates:

Item	Timeline
Flood Mitigation Design Projects Award	January 2021
Preliminary Design Reports Completion	April 30, 2021
Detailed Approvals Update Submissions	May 2021
Flood Mitigation Project Construction Tendering	July 2021
Flood Mitigation Project Award	August 2021
Flood Mitigation Project Construction	Sept. 2021 to Nov. 2022

Work Completed to Date

- Newcastle Beach – Brush Clearing for River and Creek Channel Conveyance Capacity completed March 2020 (AEP Water Act Approval #5048640)
- Newcastle Beach - Sand Bar Trimming for River Channel Conveyance Capacity Improvements completed April 2020 (AEP Water Act Approval #5049245)
- Project Land Assembly for flood mitigation projects (2019 – ongoing)
- First Nations Consultation, FCN # FNC202006286 (ACO Adequacy received Jan 12, 2021)
- Municipal Development Plan (MDP) and Land Use Bylaw (LUB) rewrites (approved December 2020)
- Three fish and fish habitat assessments completed fall 2020 (Red Deer River at Cambria, Lehigh, East Coulee, Nacmine, North Drumheller, 55th Street to Willow Estates, and Rosebud River)
- Four terrestrial vegetation and wildlife habitat assessments completed fall 2020 (Midland, Newcastle, Centennial Park, Willow Estates, Cambria, Lehigh, East Coulee, Nacmine, North Drumheller, Rosedale, Hoodoo Trail, Wayne Valley, and CN Rail)



Potential Issues and Mitigation Measures

Potential Issue	Mitigation
Water level rise due to dike encroachment	Impact limited ~ 0.1m (nhc, 2020)
Public Concerns	On-going communication, stakeholder engagement and community level consultation
Multiple consulting teams on program	“One window” submission approach from DRFMO, consistent background data used, common design standards
Fish and Fish Habitat Impacts	Most dike work set well back from river banks, erosion mitigation work to follow RAP, designed to be self-compensatory, specific construction practices to mitigate impacts
Construction - impacts to wildlife and vegetation	Potential impacts and mitigations documented in Dec 2020 assessment reports; additional surveys and sweeps conducted as needed pre-construction
Construction – noxious weeds	Contractors to develop weed management plans

Questions & Discussion

1. Introductions
2. Program overview presentation
3. Questions & discussion on program
4. Next steps for Water Act approvals
5. Closing

Historical Resources Act Requirements

Proponent: Drumheller Resiliency and Flood Mitigation Office
224 Centre Street, Drumheller, AB T0J 0Y4

Contact: Mr. Darwin Durnie

Agent: Drumheller Resiliency and Flood Mitigation Office

Contact: Andrew Neuman

Project Name: Drumheller Resiliency and Flood Mitigation

Project Components: Flood Mitigation / Remediation
Other - trails, signage, pavilions, kiosks

Application Purpose: Requesting HRA Approval / Requirements

Pursuant to Section 37(2) of the *Historical Resources Act*, a Historic Resources Impact Assessment is required for all or portions of those activities described in this application and its attached plan(s)/sketch(es). The Historic Resources Impact Assessment is to be conducted in accordance with the instructions outlined in the following schedule.



David Link
Assistant Deputy Minister
Heritage Division
Alberta Culture, Multiculturalism
and Status of Women

SCHEDULE OF REQUIREMENTS

ARCHAEOLOGICAL RESOURCES

Pursuant to Section 37(2) of the *Historical Resources Act*, a Historic Resources Impact Assessment for archaeological resources is to be conducted on behalf of the proponent by an archaeologist qualified to hold an archaeological research permit within the Province of Alberta. A permit must be issued by Alberta Culture, Multiculturalism and Status of Women prior to the initiation of any archaeological field investigations. Please allow ten working days for the permit application to be processed.

1. The Historic Resources Impact Assessment is to be carried out prior to the initiation of any land surface disturbance activities under snow-free, unfrozen ground conditions. Should the project require field studies under winter conditions, directions in the [Archaeological Survey Information Bulletin: Winter Conditions](#) must be followed.

SCHEDULE OF REQUIREMENTS (continued)

2. The Historic Resources Impact Assessment must address all areas of high archaeological potential within the project area including, but not limited to, undisturbed terrain in areas that have not been assessed systematically under previous Historic Resources Impact Assessment studies, and areas in proximity to previously recorded archaeological and historic sites. The permit application is to be accompanied by a detailed selection of areas for assessment.
3. A deep testing program is required in areas of significant sedimentation.
4. During the conduct of the Historic Resources Impact Assessment the proponent's consulting archaeologist is to confirm the relationship between the footprint of the proposed project and the following previously recorded archaeological sites: EiPd-1 and EiPd-3.
5. Results of the Historic Resources Impact Assessment must be reported to Alberta Culture, Multiculturalism and Status of Women and subsequent *Historical Resources Act* approval must be granted before development proceeds.
6. Site-specific conditions and approvals are itemized below.

SITE	HRV	SITE DESCRIPTION	CONDITIONS/APPROVAL
EiPd-1	4	campsite, killsite	The proponent's consulting archaeologist is to confirm the relationship between this site and the footprint of the proposed project.
EiPd-3	4	campsite	The proponent's consulting archaeologist is to confirm the relationship between this site and the footprint of the proposed project.

PALAEONTOLOGICAL RESOURCES

There are no *Historical Resources Act* requirements associated with palaeontological resources; however, the proponent must comply with [Standard Requirements under the Historical Resources Act: Reporting the Discovery of Historic Resources](#), which are applicable to all land surface disturbance activities in the Province.

ABORIGINAL TRADITIONAL USE SITES

There are no *Historical Resources Act* requirements associated with Aboriginal traditional use sites of a historic resource nature; however, the proponent must comply with [Standard Requirements under the Historical Resources Act: Reporting the Discovery of Historic Resources](#), which are applicable to all land surface disturbance activities in the Province.

HISTORIC STRUCTURES

There are no *Historical Resources Act* requirements associated with historic structures; however, the proponent must comply with [Standard Requirements under the Historical Resources Act: Reporting the Discovery of Historic Resources](#), which are applicable to all land surface disturbance activities in the Province.

SCHEDULE OF REQUIREMENTS (continued)
PROVINCIALY DESIGNATED HISTORIC RESOURCES

There are no *Historical Resources Act* requirements associated with Provincially Designated Historic Resources; however, the proponent must comply with [Standard Requirements under the *Historical Resources Act: Reporting the Discovery of Historic Resources*](#), which are applicable to all land surface disturbance activities in the Province.

ADDITIONAL COMMENTS

1. To obtain contact information for consultants qualified to undertake the assessment work specified above, please consult the list of [Alberta Historic Resource Consultants](#).
2. In addition to any specific conditions detailed above, the proponent must abide by all [Standard Conditions under the *Historical Resources Act*](#).

Lands Affected: All New Lands

Proposed Development Area:

MER	RGE	TWP	SEC	LSD List
4	20	29	1	1-2,6-8,10-14
4	19	28	29	1-3,7-11,13-14
4	18	27	29	8-10,14-16
4	19	28	14	1-2,5-7,11-12
4	20	29	14	3
4	20	29	8	7-16
4	20	29	18	1-2,8
4	19	28	15	9-10,13-16
4	20	29	12	3-5
4	20	29	11	1-14
4	18	27	32	2-3,5-6,12
4	19	28	12	9-10,13-15
4	18	28	6	1-2,7-10,14-15
4	20	29	10	1-3,5-12,14-16
4	19	28	31	1-2,6-7,11-13
4	19	28	28	2-7
4	20	29	9	1-2,5-12
4	19	28	11	16

SCHEDULE OF REQUIREMENTS (continued)

4	20	29	17	3-4
4	19	28	21	7-10,14-15
4	19	28	22	2-5
4	18	28	7	2-3,5-6,12
4	19	28	20	14-16
4	18	27	31	9,15-16
4	20	29	7	9,15-16
4	19	28	13,32	4
4	18	27	28	5,12
4	19	29	6	4
4	20	28	36	16
4	20	29	2	16

Documents Attached:

Document Name	Document Type
mapbook	Review