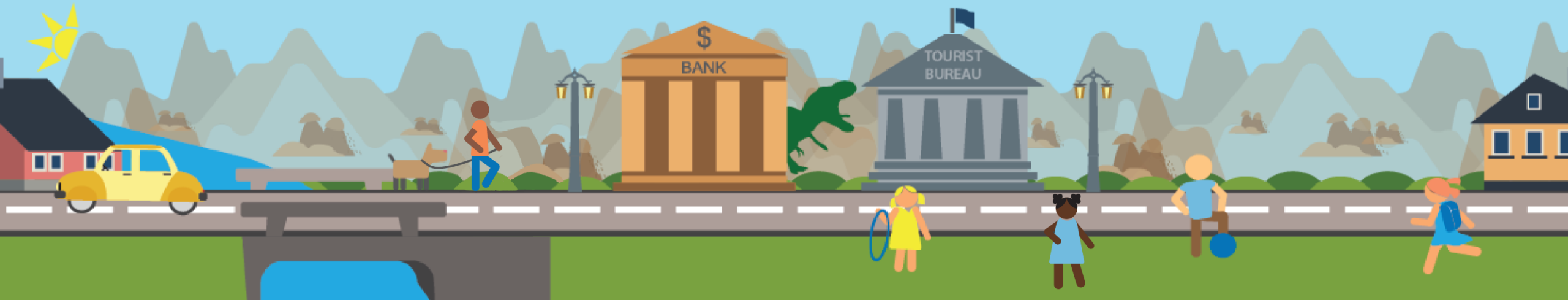
DRUMHELLER VALLEY

Drumheller Resiliency and Flood Mitigation Office

Community Engagement Event

December 9, 2021



Agenda

Welcome everyone, I’m Kathryn Kolaczek the Communications Lead and event host. Today’s agenda is as follows:

- Land Acknowledgement
- Overview of event and format
- Introduce the team
- Introduce the speakers
- Presentation
- Question and answer period – Virtual vs In Person

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Land Acknowledgement

The Town of Drumheller respectfully acknowledges that we are on Treaty 7 territory, the ancestral and traditional territory of the Blackfoot Confederacy: Kainai, Piikani, and Siksika, as well as the Tsuut'ina First Nation, the Stoney Nakoda First Nation and Metis Nation Region 3. We recognize the land as an act of reconciliation and gratitude to those on whose territory we reside.

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Please Be Considerate

- Please respect your fellow neighbours and today's speakers. Abuse will NOT be tolerated.
    - Virtual Questions will be managed through the Q&A tool.
    - In person questions will be managed at each of the tables around the room

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Today's Team

Deighen Blakely, P. Eng, Project Director

Harvey Saltys, Community Advisory Committee

Mark Brotherton, P. Eng, Parkland Geo

Ernie Webster, Landscape Architect, IBI Group

Julia Tarnowski, M. Eng, P. Eng, SweetTech Engineering

Cristal McLean, Principal, Landscape Architect, Ground Cubed

Matt Knapik, Sarah Lumley, Reg Johnston, DARP Team

Darryl Drohomerski, Erica Crocker, Bret Crowle, Town of Drumheller

Jon Boyle, P. Ag, Rangeland Environmental Services Ltd.

Tracy Van Egmond, Admin Assistant, Flood Office

Kathryn Kolaczek, Communications Lead, Alchemy Communications

Robyn Betts, Communications Team, Alchemy Communications

Kate Chase, Communications Team, Alchemy Communications

Matt Knapik, Sarah Lumley, Reg Johnston, DARP Team

Today's Presenters

Deighen Blakely, P. Eng, Project Director

Cristal McLean, Principal, Landscape Architect , Ground Cubed

Julia Tarnowski, M. Eng, P. Eng, SweetTech Engineering

Harvey Saltys, Community Advisory Committee

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Deighen Blakely, P. Eng, Project Director

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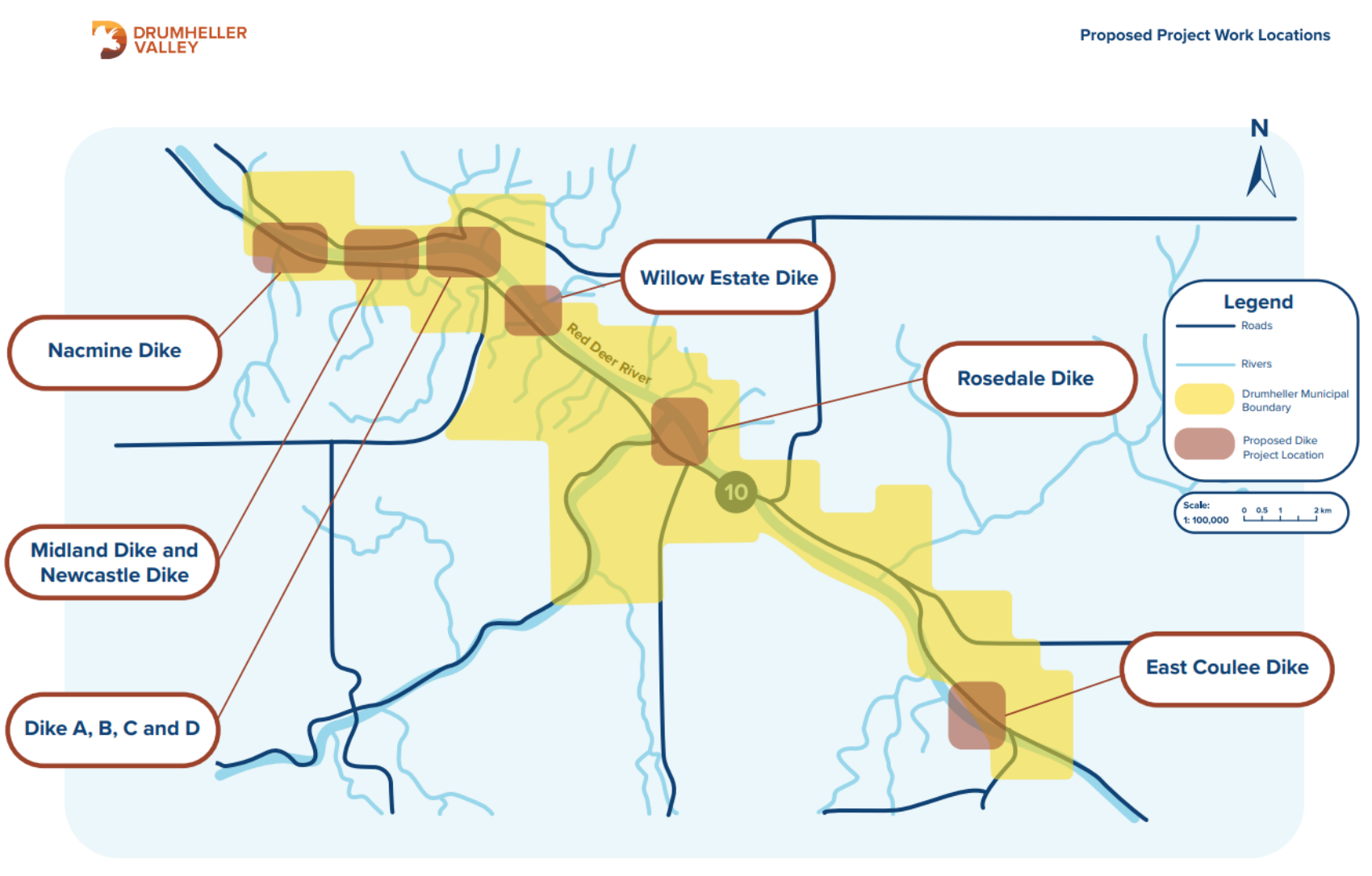
Project Locations



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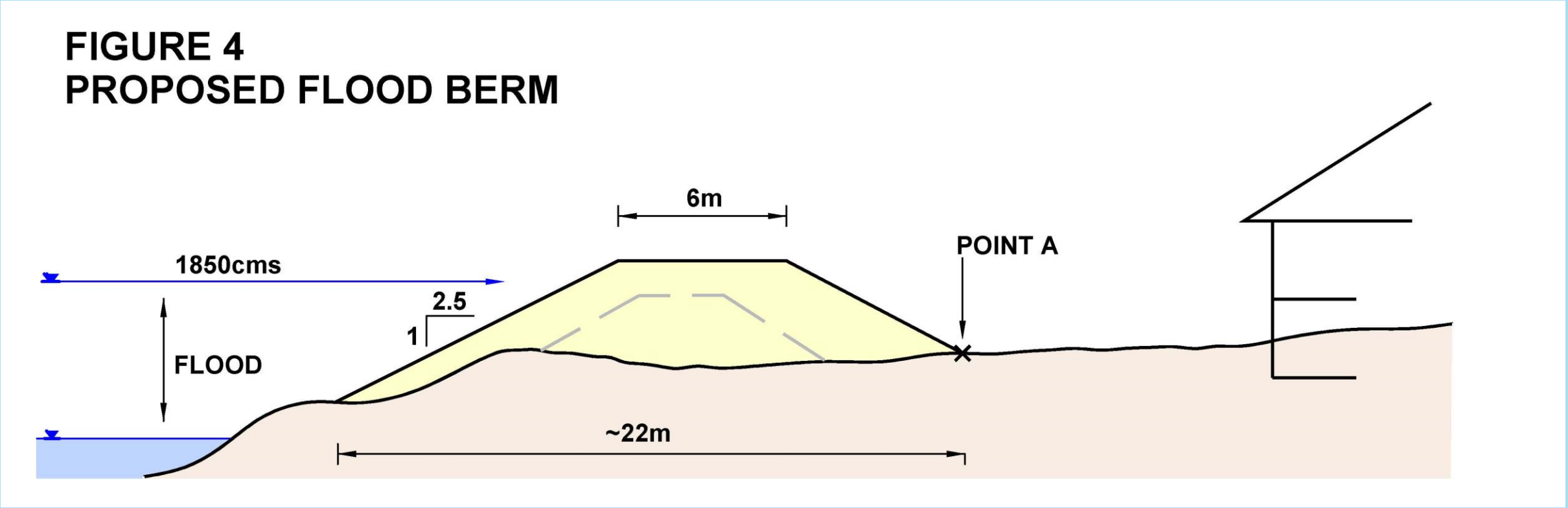
Flood Berm Design



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Flood Mitigation Program Budget $55M

We are funded in part by:

- Government of Canada Disaster Mitigation and Adaptation Fund ($22 M, 40% funding)
- Government of Alberta Community Resiliency Program ($26.4 M, 50% funding)
- Town of Drumheller ($6.6 M, 10% funding)

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Upcoming Regulatory Consultation Work

The project will require consultation with and/or approvals from the following:

- Alberta Environment and Parks (Water Act Approval or Amendments)
- Alberta Public Lands (TFA and/or DLO)
- Alberta Aboriginal Consultation Office (Indigenous Consultation)
- Alberta Culture, Multiculturalism and Status of Women (Historic Resources Impact Assessment)
- Fisheries and Oceans Canada (self-assessment/Request for Review)
- Transport Canada Navigable Waters (Minor Works)

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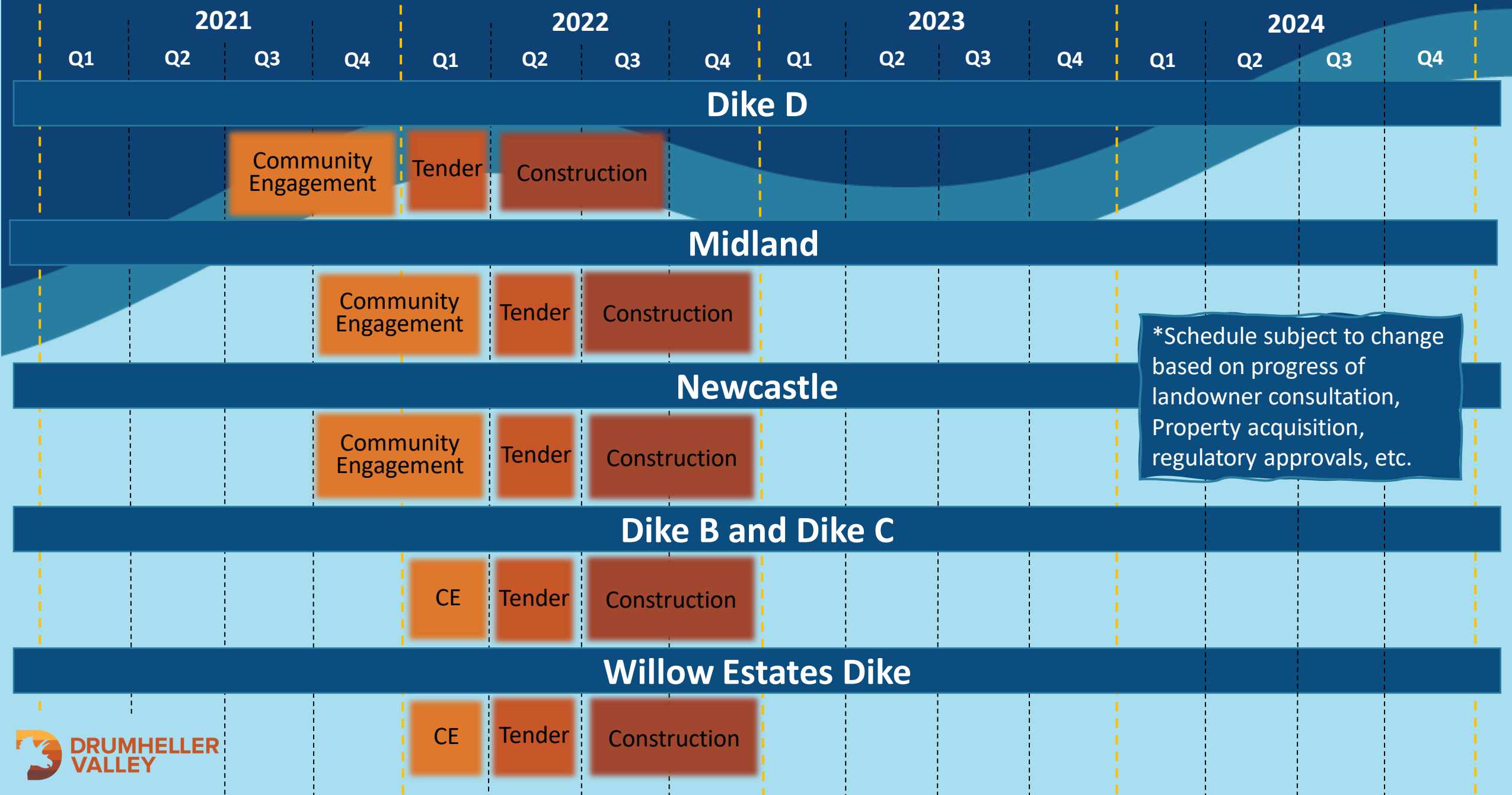
DRFM – Preliminary Program Schedule*



*Schedule subject to change based on progress of landowner consultation, Property acquisition, regulatory approvals, etc.

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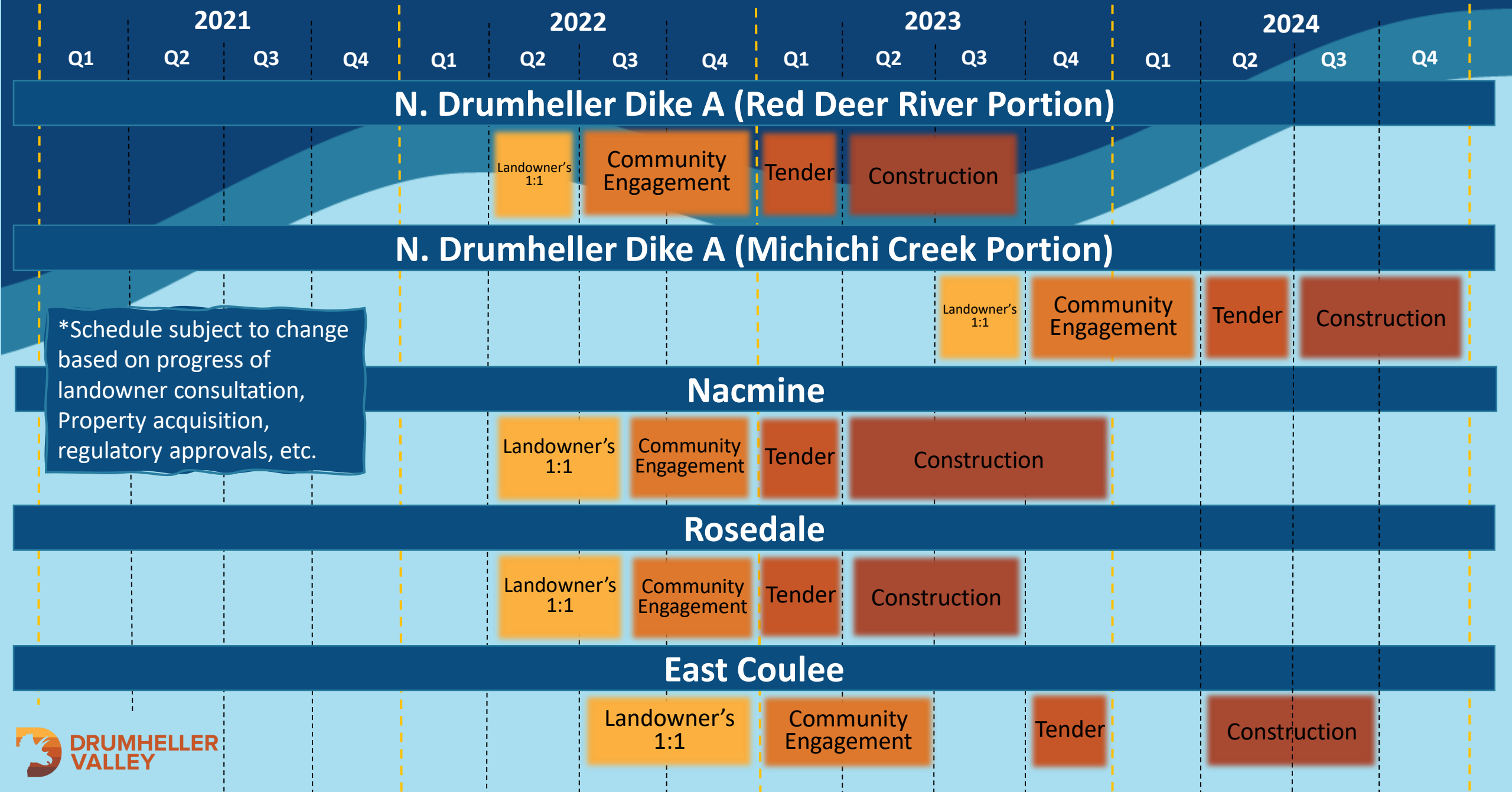
DRFM – Preliminary Program Schedule*



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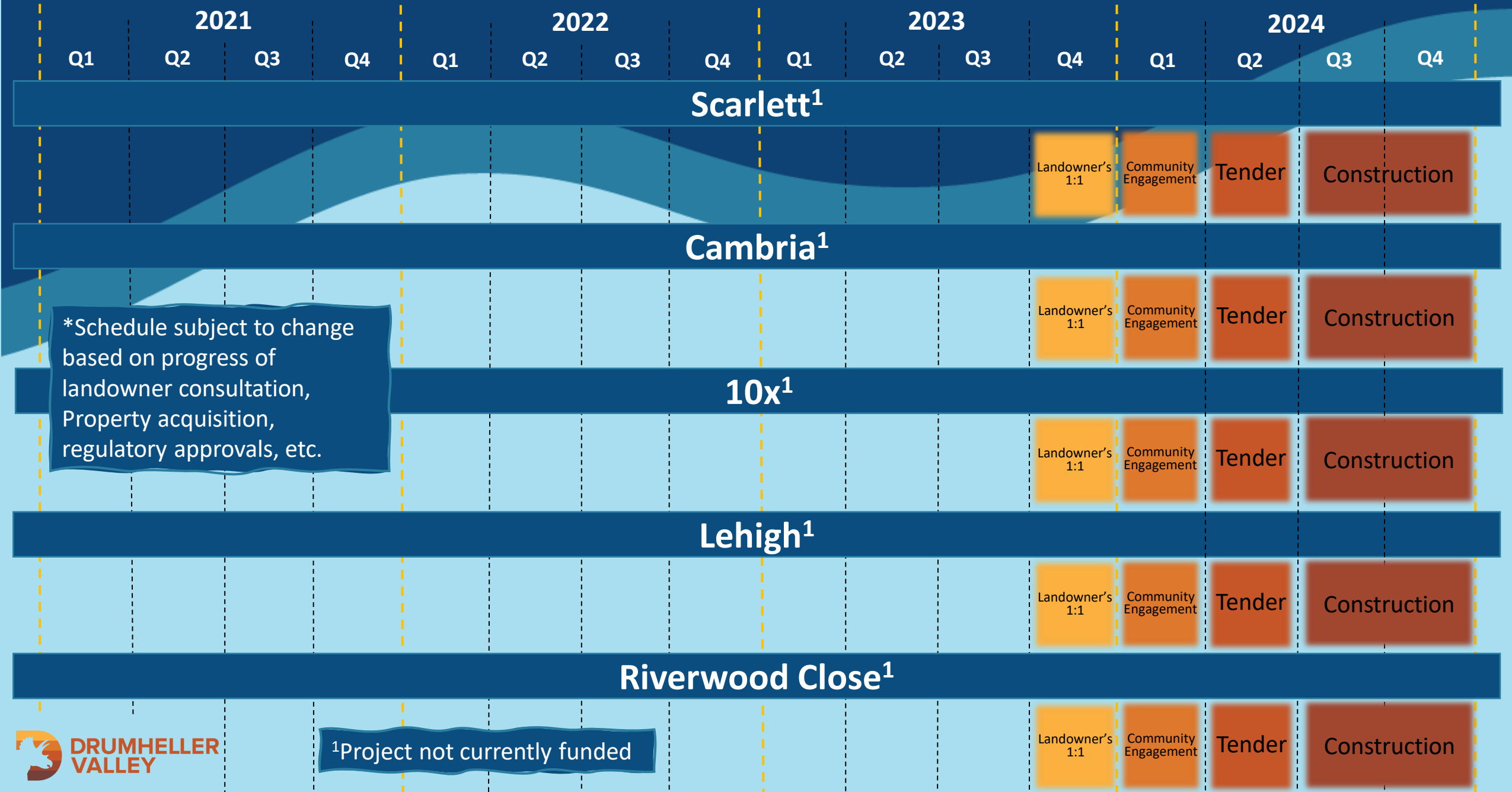
DRFM – Preliminary Program Schedule*



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[1]Project not currently funded

Cristal McLean, Principal, Landscape Architect, Ground Cubed

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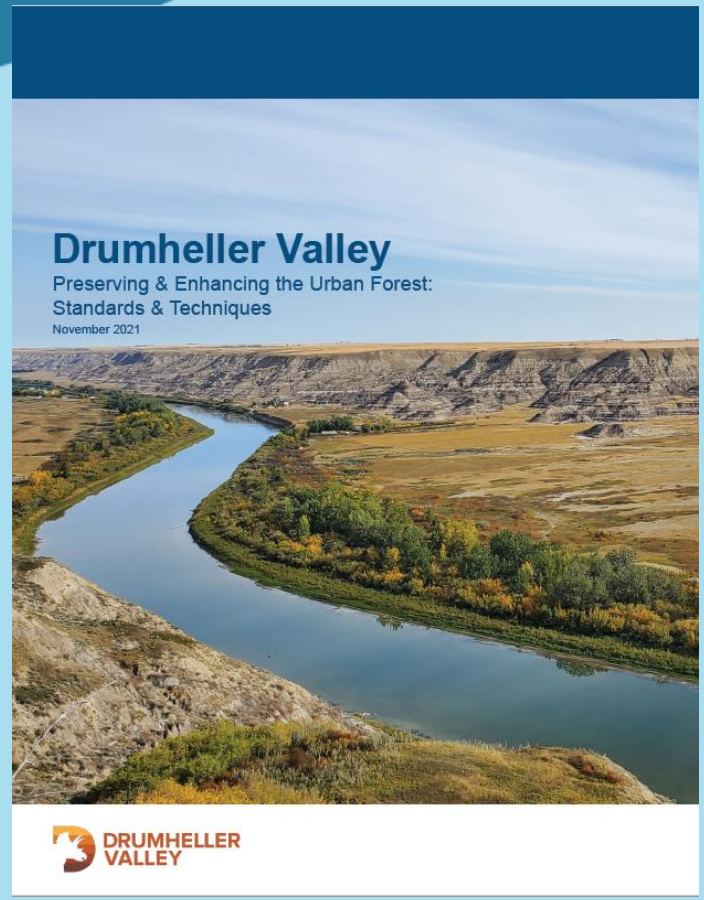
Preserving & Enhancing the Urban Forest: Standards & Techniques
PROJECT TIMELINES

- The first internal draft of the **Urban Forest Strategy** was completed at the end of August 2021
- The draft was revised and circulated to Drumheller administration at the end of October 2021
- The final draft was approved in November 2021



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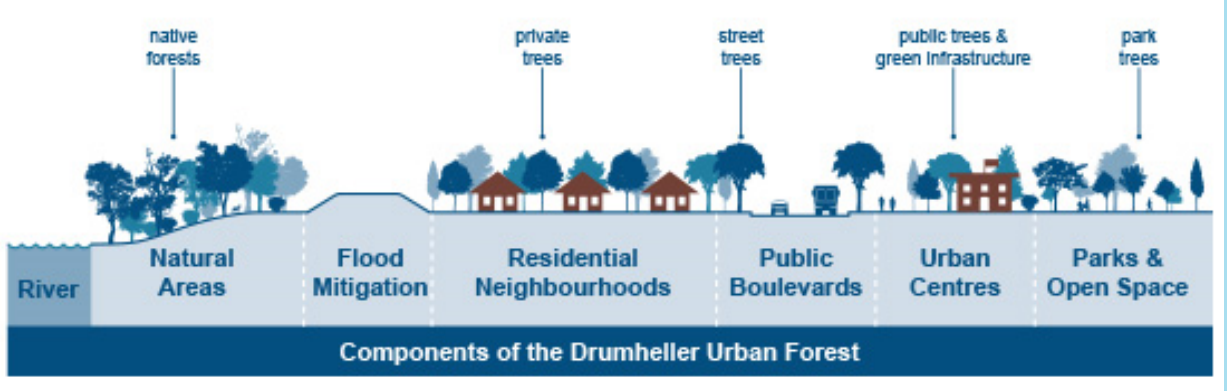
What is the Urban Forest?

The generation of the **Urban Forest Strategy** was done as part of the Drumheller Flood Mitigation Office project, but the goals and strategies outlined in the document are intended to serve the entire Drumheller Valley – **not just the areas associated with the flood mitigation project.**



- ecosystems composed of trees, shrubs and other vegetation that provide municipalities with environmental, economic and social benefits
- it includes street and yard trees, vegetation within parks and along public rights of way
- Urban Forestry is the planned and programmatic approach to the development and maintenance of the urban forest

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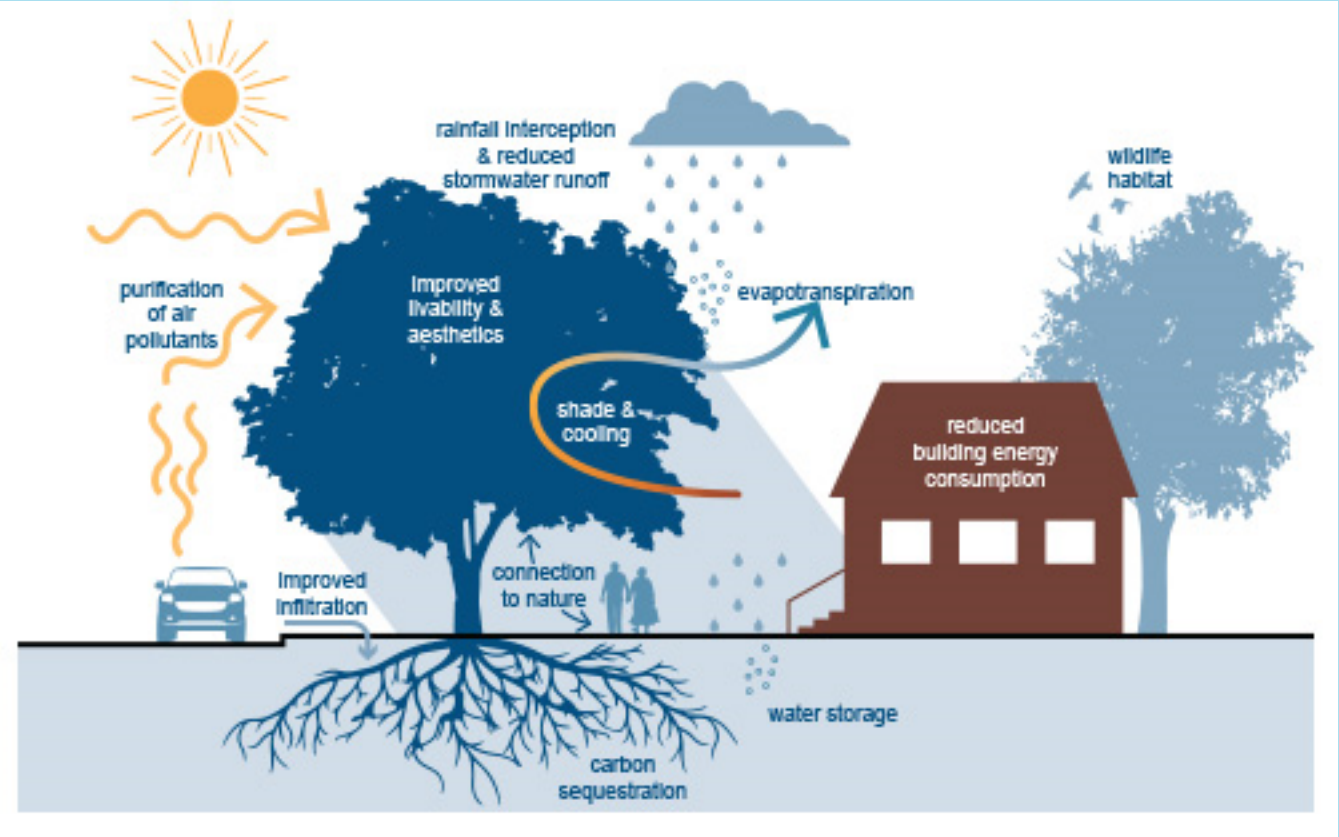
What are the benefits of a healthy Urban Forest?

- improved wildlife habitat
- increased shading and cooling
- purifying air
- improved storm water infiltration and storage



- reduced energy consumption
- rainfall interception
- reduced heat island effect
- improved aesthetics and livability

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What is this 5:1 ratio all about?

- for trees being removed from the existing urban forest, they will be replaced at a ratio of 5:1 – 5 replacements for every 1 removal
- the replacements may be trees or shrubs or a combination of trees or shrubs

Why the ratio? It is a 2-part answer:

- by using a **carbon sequestration** evaluation method for calculating the CO2 replacement time frame we are provided with a reasonable assessment metric
- balancing the CO2 replacement time frame with the **management and maintenance realities** of the living asset of the Urban Forest

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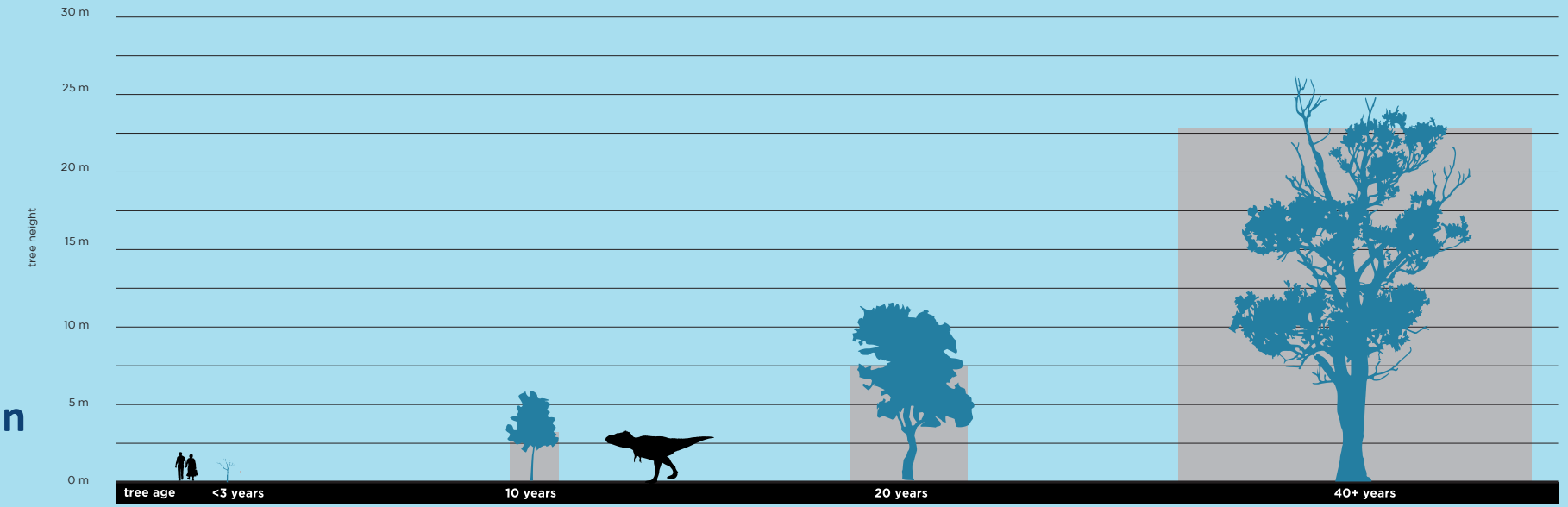
What is carbon sequestration all about?

- carbon sequestration is the process of capturing and storing atmospheric carbon dioxide (C02)
- the amount of CO2 sequestered by a tree will vary depending on its species, growth rate, density of its wood and stage of life

Why is carbon sequestration formula useful?

We are able to easily determine how quickly new tree and shrub plantings are able to capture similar amounts of CO2 previously sequestered by other trees

assumed amount of CO_2 sequestered by a tree at various life stages



sapling

height: 1.2 m
trunk diameter: 10 mm
CO_2 sequestered: 0.1 kg (lifespan)
CO_2 sequestered: 0.05 kg (annual avg.)

**assumed age of 2 years*

young tree

height: 6.0 m
trunk diameter: 170 mm
CO_2 sequestered: 159.6 kg (lifespan)
CO_2 sequestered: 16.0 kg (annual avg.)

**assumed age of 10 years*

early mature tree

height: 12.0 m
trunk diameter: 370 mm
CO_2 sequestered: 907.3 kg (lifespan)
CO_2 sequestered: 45.4 kg (annual avg.)

**assumed age of 20 years*

mature tree

height: 25.0 m
trunk diameter: 775 mm
CO_2 sequestered: 8291.7 kg (lifespan)
CO_2 sequestered: 207.3 kg (annual avg.)

**assumed age of 40 years*

amount of CO_2 sequestered by tree over lifespan (1 mm^2 = 1 kg)

** represented species Populus balsamifera* (balsam poplar)
** assumed growth rate of 600 +/- mm height per year*
** assumed growth rate of 20 mm diameter per year*
** albertasaurus for scale*

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Preserving & Enhancing the Urban Forest: Standards & Techniques documents can be found here:

- Abridged: https://floodreadiness.drumheller.ca/public/download/files/196194
- Unabridged: https://floodreadiness.drumheller.ca/public/download/files/196193

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Julia Tarnowski, M. Eng, P. Eng, SweetTech Engineering

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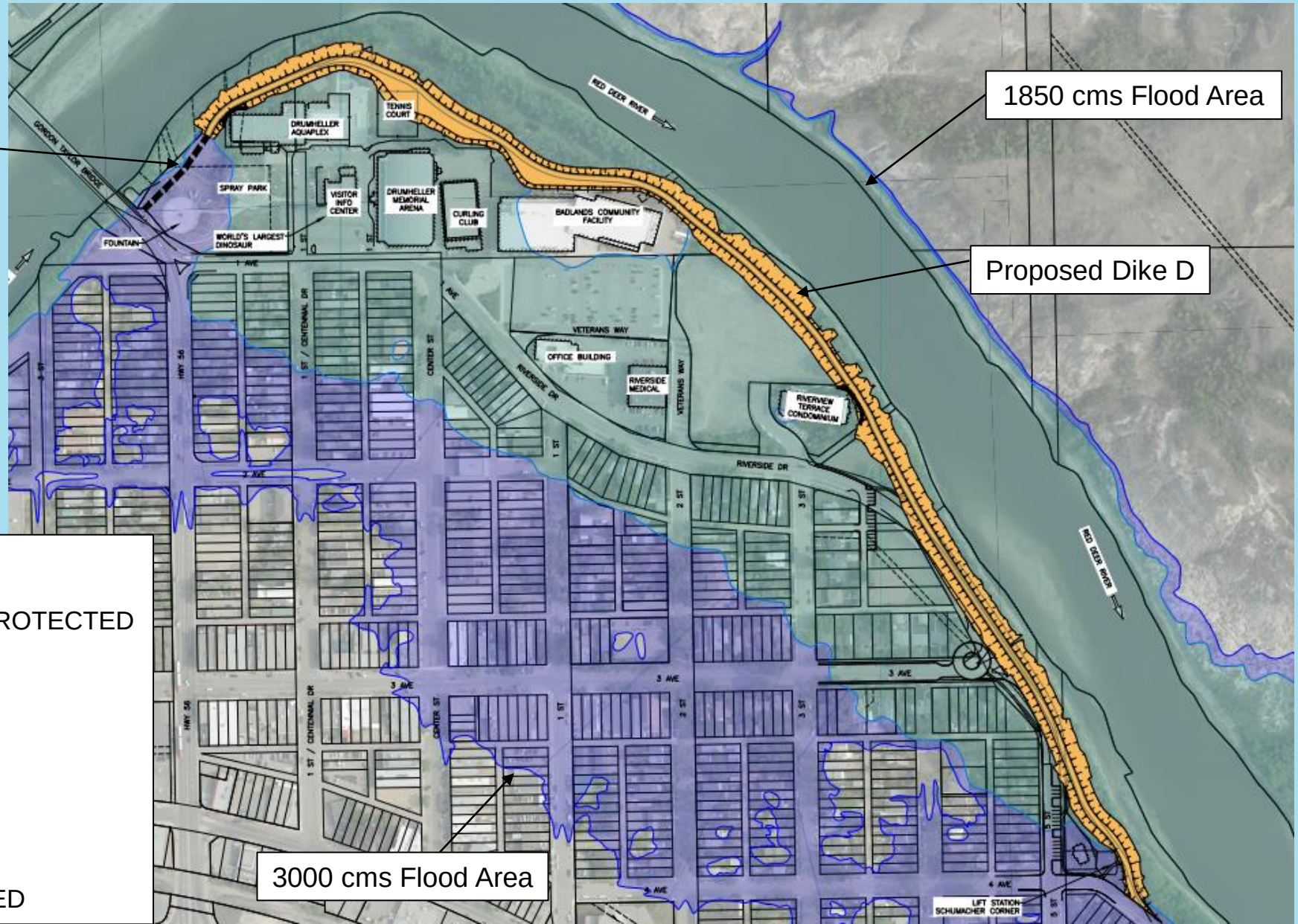
Dike D Existing Dike Alignment

Dike D Proposed Dike Alignment



PROTECTION AT 1850 CMS

70 HOMES PROTECTED

4 MULTI UNIT RESIDENTIAL BUILDINGS PROTECTED

2 COMMERCIAL BUILDINGS PROTECTED

5 COMMUNITY BUILDINGS PROTECTED

- BADLANDS COMMUNITY FACILITY
- CURLING CLUB
- DRUMHELLER MEMORIAL ARENA
- DRUMHELLER AQUAPLEX
- VISITOR INFORMATION CENTRE

PROTECTION AT 3000 CMS

ADDITIONAL **162** PROPERTIES PROTECTED

Dike D – Timeline of Activities To-Date

- Contract Award & Kickoff – Mid February 2021
- Feasibility Study, Field Investigations & Lab Testing – February-April, 2021
- Tree Clearing in Anticipation of Summer 2021 Construction – March-May 2021
- Bird Nest and Wildlife Surveys to Support Tree Clearing – May 2021
- Project Pause and Reset – June 2021
- Public Open House – August 2021
- Tree Health Assessment – September, 2021
- Evaluate and Assess Dike Alignment Options – June-November, 2021
- Detailed Design – In Progress

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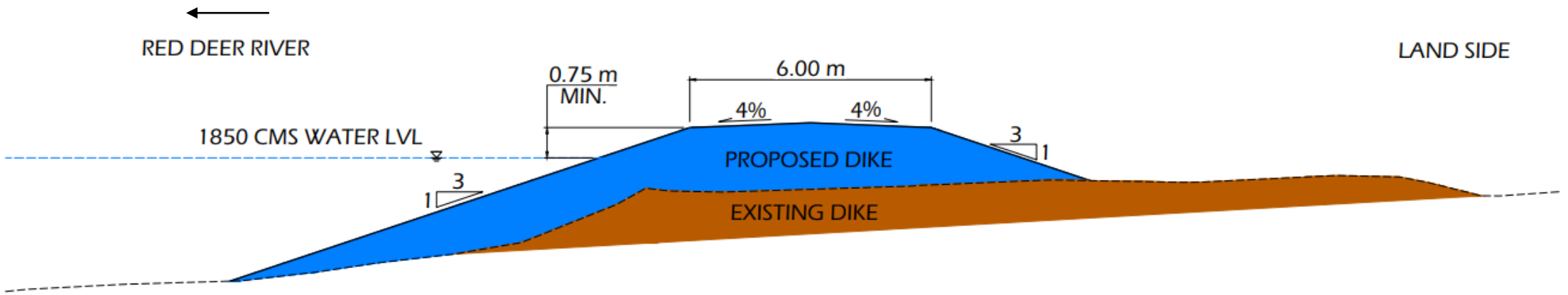
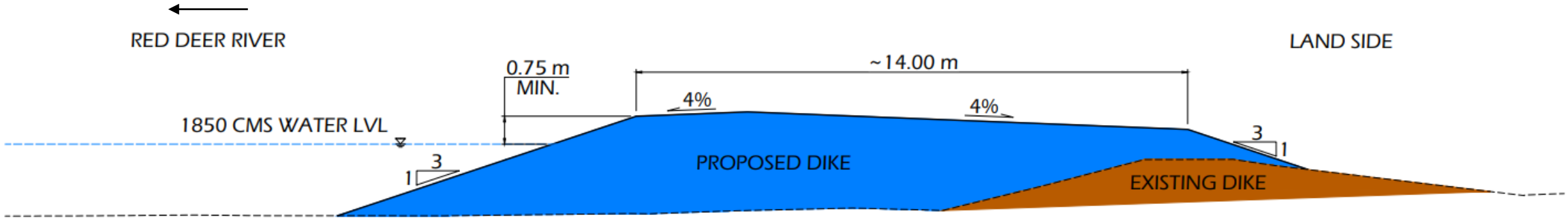
Dike D – Gordon Taylor Bridge to BCF

Dike D Typical Cross-Section

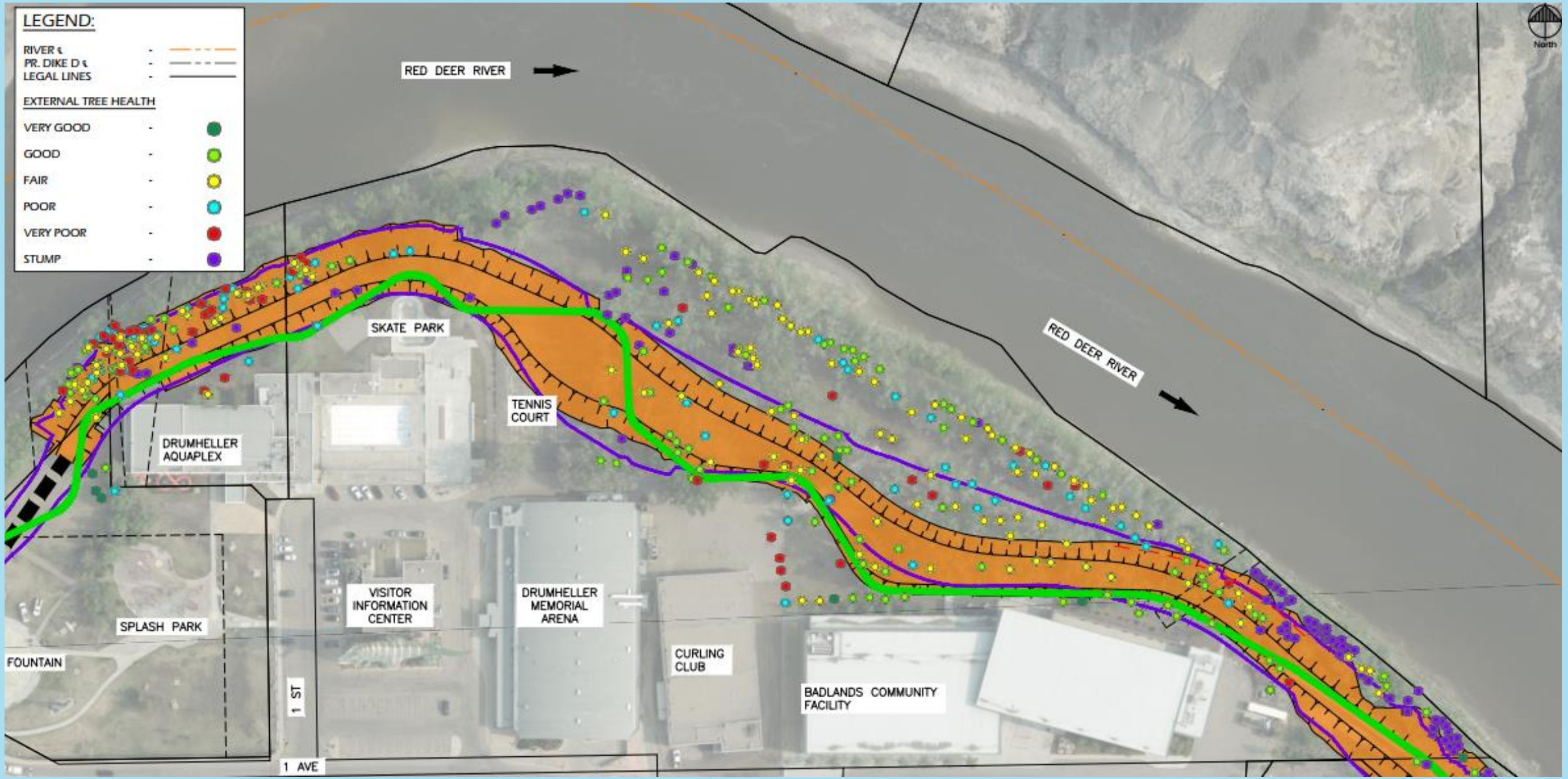


Dike D Cross-Section – Centennial Park

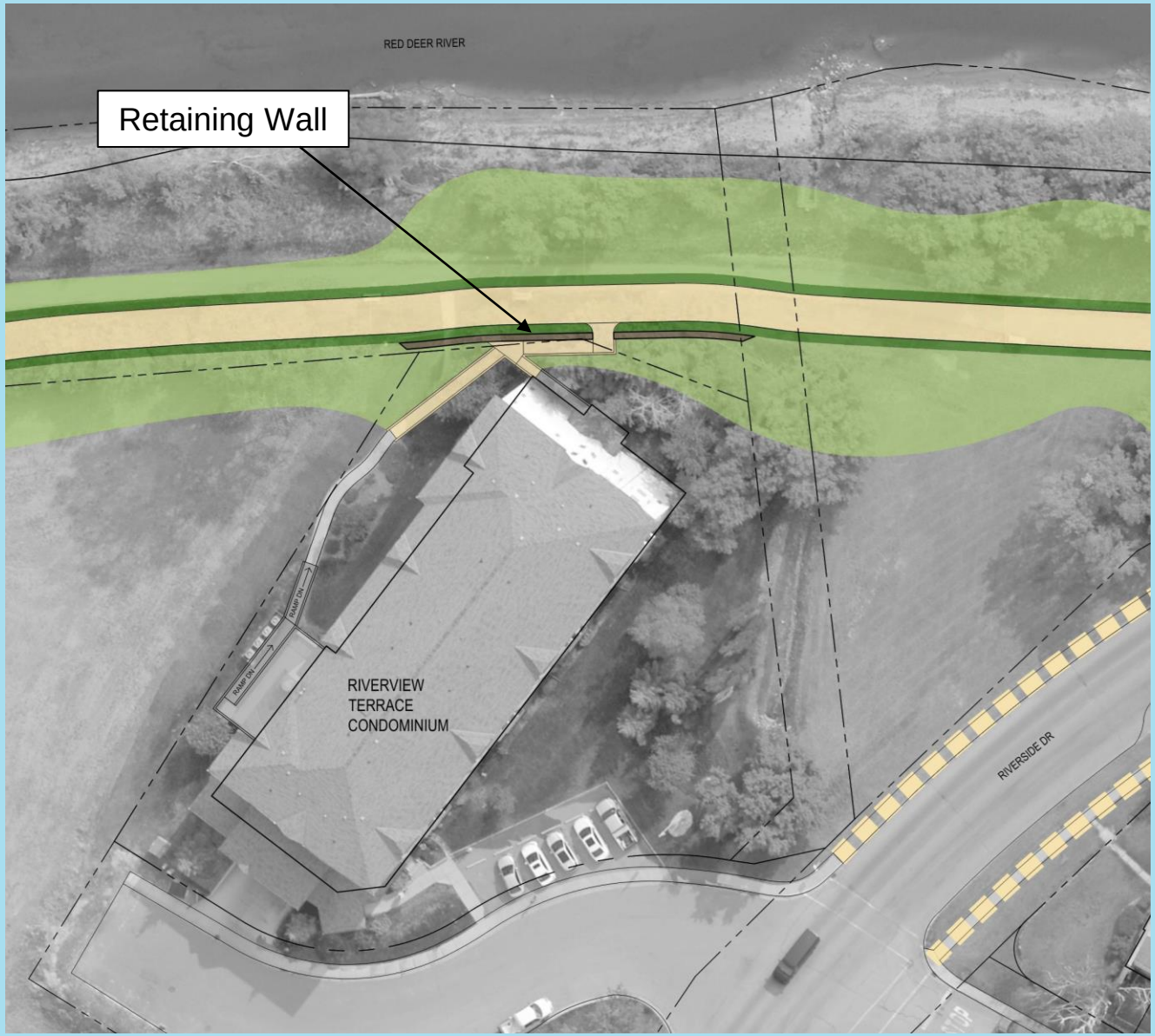


Dike D – BCF to Riverview Terrace

Dike D – Tree Health Assessment



Dike D – Riverview Terrace



Riverside Dr Options Assessment

A detailed options assessment was undertaken for the Dike D alignment along Riverside Dr that included the following options:

- Extend Dike D into the Red Deer River with no changes to Riverside Dr
- Modifications to Dike D cross-section to not extend into Red Deer River and no changes to Riverside Dr
- Modifications to Dike D cross-section and modifications to Riverside Dr, including:
  - Changes to Riverside Dr and 3rd Ave intersection
  - Reducing Riverside Dr to a one lane, one-way road
  - Closure of Riverside Dr (2 blocks) and cul-de-sac on 3rd Ave

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Riverside Dr Options Assessment Results

- Extension of Dike D into the Red Deer River with no changes to Riverside Dr
  - Dike would need to extend ~ 20m into the Red Deer River
  - Would cause significant environmental impact to aquatic habitat
  - DFO has indicated that authorization under the *Fisheries Act* would require justification that no other option feasible
  - Would constrict the flow of the Red Deer River
- Modifications to Dike D cross-section to not extend into Red Deer River and no changes to Riverside Dr
  - Dike would require a retaining wall ~300 m long and over 3 m (10 ft) high
  - Retaining wall is ~5x more expensive than earth-fill berm
  - This option would increase the cost of Dike D beyond the available budget

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Riverside Dr Options Assessment Results

- Modifications to Dike D cross-section and modification to intersection of Riverside Dr and 3rd Ave
  - Dike would require a retaining wall ~150 m long and over 3 m (10 ft) high
  - Retaining wall is ~5x more expensive than earth-fill berm
  - This option would require extensive roadwork to reconfigure the intersection
  - This option would increase the cost of Dike D beyond the available budget

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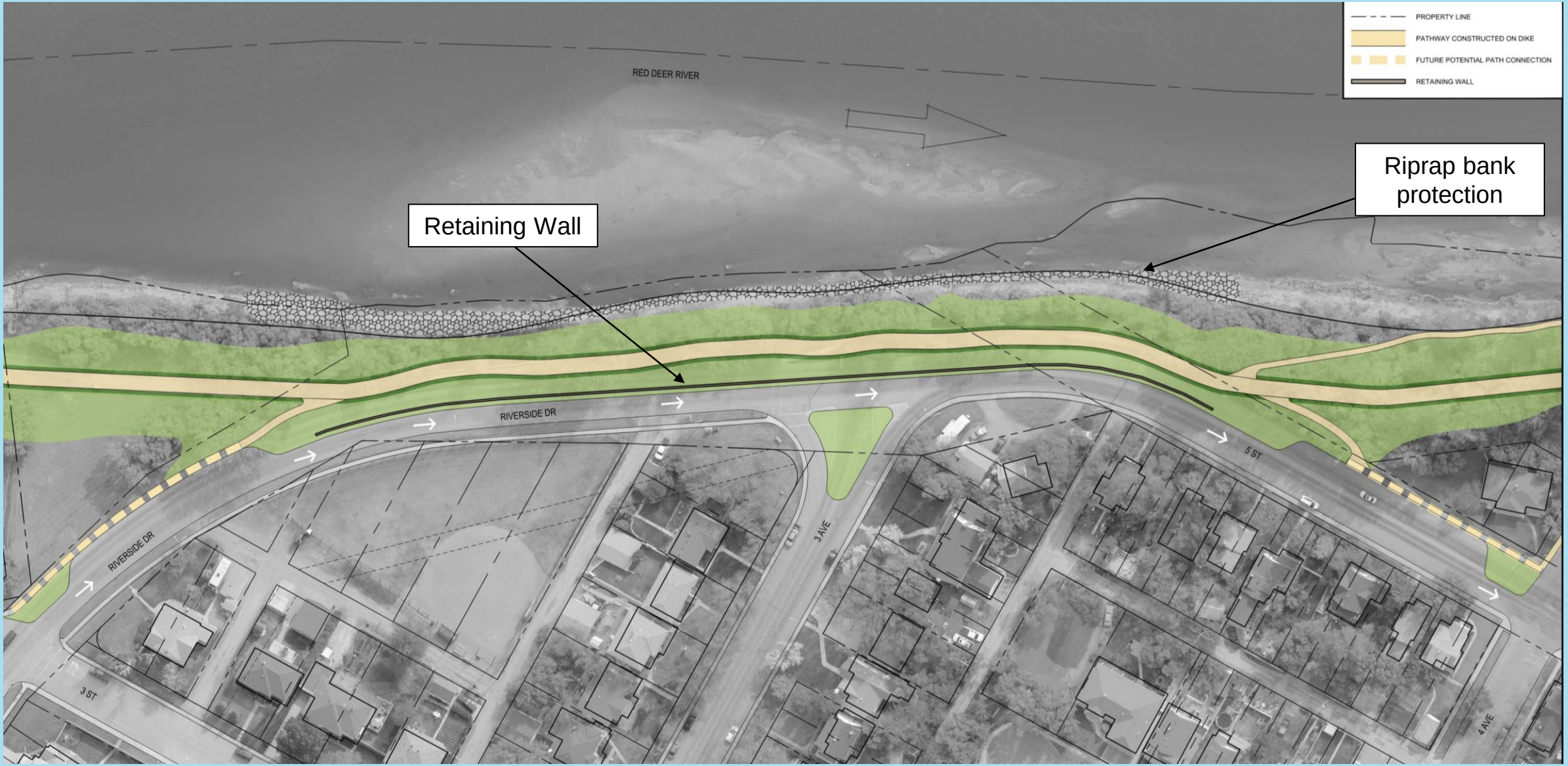
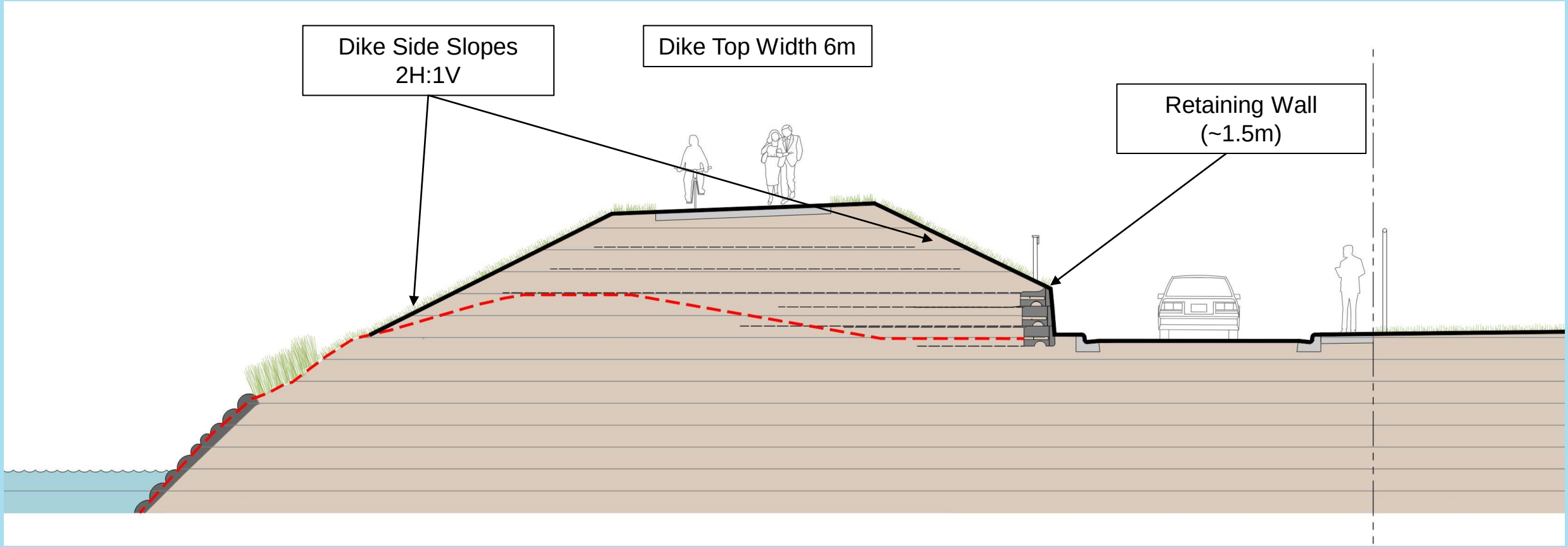
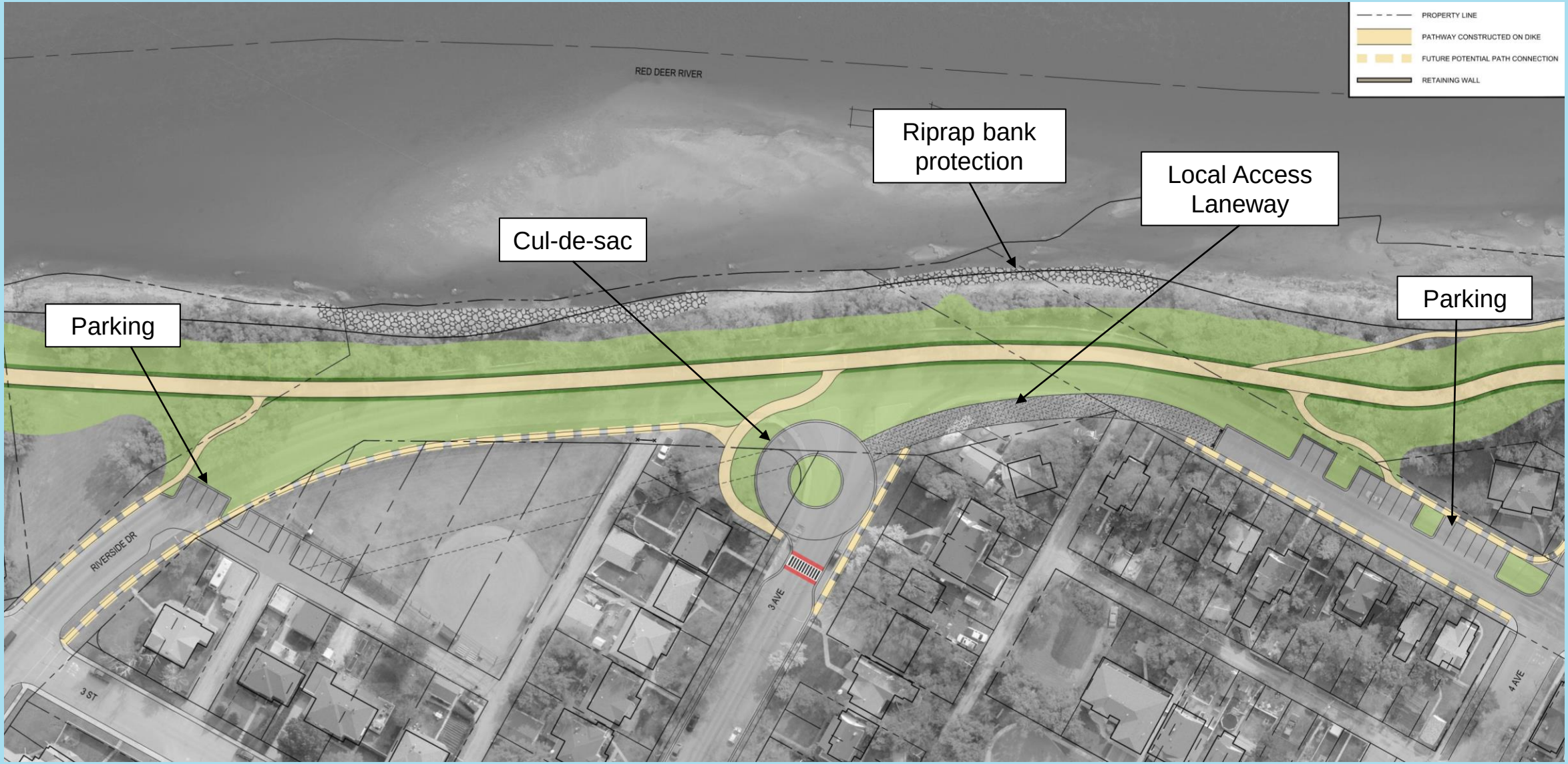
Dike D – Riverside Dr. (One Lane Option)



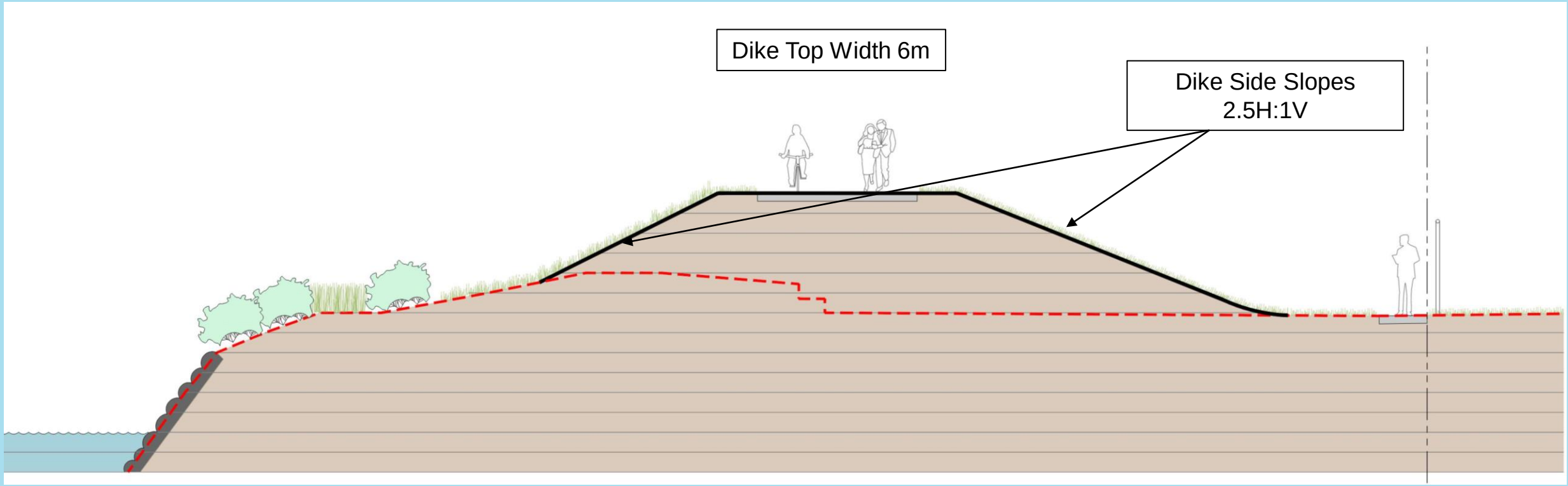
Dike D – Riverside Dr. (One Lane Option)



Dike D – Riverside Dr. (Recommended Option)



Dike D – Riverside Dr. (Recommended Option)



Riverside Dr Options Assessment Results

- Modifications to Dike D cross-section and modification of Riverside Dr. to a one-lane, one-way road
  - Dike would require a retaining wall ~300 m long and ~1.5 m (5 ft) high
  - Dike requires substantial rip rap for stabilization of riverbank
  - Added safety concerns for adaptive fill placement on retaining wall
  - Additional cost of $200k-$400k to Dike D with higher risk of increased costs
- Closure of 2 blocks of Riverside Dr and cul-de-sac at 3rd Ave
  - Dike does not require a retaining wall
  - Less rip rap required for stabilization of riverbank
  - Provides additional green space and park area adjacent to Downtown and Centennial Park
  - Maintains Dike D within available budget

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Dike D – Anticipated Timeline of Upcoming Activities

- Tendering – January to April, 2022
- Public Engagement – January to March, 2022
- Tree Clearing – March-April, 2022
- Construction of Dike D from Aquaplex to Riverview Terrace – April to July, 2022
- Centennial Park Available after June 30, 2022
- Construction of Dike D along Riverside Dr – June to October, 2022

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Harvey Saltys, Community Advisory Committee

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Introduction – Resiliency & Flood Mitigation Community Advisory Committee (CAC)

Committee Members:

- Cate Samuel
- Harvey Saltys
- Irv Gerling
- Keith Hodgson
- Tony Miglecz
- Wayne Powell

Mission:

To enhance communication among all parties on matters relating to the flood mitigation project.

Who we ARE:

Caring and open-minded volunteers and citizens of this community whose role is to actively engage all parties in this project, searching for common ground and possible solutions.

Who we are NOT:

Elected or self-appointed spokespersons created to erect a barrier, hindrance, or buffer between affect parties.

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Traffic Implications

https://www.surveymonkey.com/r/DowntownDrumTraffic

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Questions?

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Questions?

Q: Why can’t we push Dike D out into the Red Deer River further and keep Riverside Drive Open?

A: The Flood Team has heard quite clearly from Fisheries and Oceans Canada and Alberta Environment and Parks that dike encroachment into the river will not be permitted if there is a viable alternate, like the option currently selected. Placing fill material in a river causes significant harm to the aquatic environment and takes away from the room for the river to flow, so that option was discounted.

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Questions?

Q: Were any alternates considered to closing Riverside Drive?

A: The design team considered a number of options, including a partial road closure (one way traffic), and leaving the road fully open but constructing a full height retaining wall. The selected option (full road closure for one block) was deemed the best alternate in terms of cost, constructability, leaving room for the river and limiting fisheries impacts.

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Questions?

Q: Why don’t we just put Riverside Drive on top of the berm?

A: To place the road on top of the berm would require that it be built to a much higher standard in terms of the fill, berm side slopes, roadway geometry, guardrails, etc. to meet roadway standards for vehicle loading, which would significantly increase the cost of the berm, so this option was discounted.

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Questions?

Q: **When will Centennial Park be reopened?**

A: The target date for construction completion in Centennial Park is June 30, 2022, barring any unforeseen circumstances which could lead to construction delays, such as a Red Deer River flood event during construction.

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Questions?

Q: Can I still have my event in Centennial Park as planned next summer?

A: The Badlands Community Facility staff have notified customers with events planned in Centennial Park in summer 2022 about the upcoming construction work. For events that were booked coinciding with construction, the Centennial Park booking has been cancelled, and an alternate location (Riverside Park) offered. Events booked for after construction is scheduled to be completed should be able to go ahead in Centennial Park; however, the Riverside Park area will be available as a contingency in the event that construction is delayed.

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Questions?

Q: What will happen to the Memorial Benches in Centennial Park?

A: Any benches impacted by construction will be removed by Town staff and temporarily stored, then replaced once construction has been completed.

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Questions?

Q: Will the trees that were cut down in Centennial Park be replaced? Where will the replaced trees go?

A: Any trees that were cut down last year will be replaced on a 5:1 basis with new trees and shrubs. Any trees that need to be cut down this year that are in very good, good or fair condition will also be replaced on a 5:1 basis with trees and shrubs. Any trees noted to be in poor or very poor condition will not be replaced as they are near the end of their life cycle. The Landscape Architect working on the Dike D design team will identify locations for replacement trees and shrubs prioritizing placement to near where the trees were removed from, and trees and shrubs may also be placed at other locations in Downtown Drumheller, as identified in the Downtown Area Revitalization Plan.

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Questions?

Q: What will happen with the pathways in Centennial Park during construction?

A: Detour pathway routes will be identified and posted during Dike D construction, to safely get pedestrians to where they need to go adjacent Centennial Park and keep them away from on-going Dike D construction.

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Questions?

Q: Why can't we just use adaptive fill for this section of berm, like in Midland and Newcastle?

A: One of the Drumheller Resiliency and Flood Mitigation Program's goals is to build as much permanent flood mitigation infrastructure as possible in the next three years, while we have funding available, thereby minimizing future emergency response efforts and costs. Building the full section of Dike D along Riverside Drive will help to meet this goal. Unlike the adaptive fill reaches for Newcastle and Midland which would have cut off access to homes fronting on Riverside Ave and North River Drive, respectively if a full berm was built there; the section of roadway being closed to accommodate the construction of Dike D will not cut off access to any private properties.

Questions?

Q: Will the one block road closure of Riverside Drive to accommodate Downtown Dike D impact emergency services response times?

A: Access for emergency response vehicles to the neighbourhoods to the east of downtown will be maintained via a gravel alleyway connecting 3rd Ave E and 5th Street E. As well, provisions will be included in the project to implement emergency vehicle traffic light pre-emption for access to Highway 9/56, in addition to the existing Fire Department stop light at 2nd Ave and Highway 9/56 to mitigate impacts to emergency vehicle response times.

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Questions?

Q: What will happen to the memorial benches during construction?

A: Memorial benches will be moved during construction and returned once the berm has been completed. Our intention is to have these benches returned as close to their original location as possible.

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Questions?

Q: What will happen to the memorial benches in the event of a flood?

A: In the event of a flood, where adaptive fill is necessary, the affected benches will be moved by the Town and stored at a safe location before any fill material is hauled in. Once the flood waters have receded and adaptive fill has been removed, the benches will be returned as close to their original location as possible.

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Questions?

Q: As the current berms in Drumheller do not meet the design flood elevation of 1850 m^3/s plus 0.75m freeboard, if someone intends to take out a development permit do they have to build the main floor to 1850 m^3/s plus 0.75 m freeboard?

A: Residents located within the flood hazard overlay in the Land Use Bylaw must construct the first floor of their houses to the flood construction level which is the water elevation of a 1850 m^3/s flow rate on the Red Deer River. Residents are not required to include a freeboard, however building above the flood construction level increases their resilience to future flood events. The flood construction level for protected areas will be re-evaluated in the Land Use Bylaws once the berms are built.

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Questions?

Q: When the Town runs out of dollars building to 1850 m^3/s plus 0.75 m freeboard and there are remaining berms yet to construct, how will the Town be protected from possible high-water events? Would it not make more sense to build to a design flood elevation of 1640 m^3/s plus 0.75 freeboard to protect more areas of Drumheller?

A: There is no expectation that we will run out of money for the berms that have been funded. The province of Alberta has recommended that the Drumheller Valley build flood mitigation up to the 1850 m^3/s Red Deer River flow rate. If Drumheller only built the dikes to the 1640 m^3/s level, we would not be in accordance with that requirement and could impact future provincial funding.

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Questions?

Q: An explanation is required on the "protected flood fringe" area and when does the Town intend to address this concept in the Town's Land Use Bylaw so that realtors and property owners have knowledge of future regulations?

A: Protected flood fringe areas will consist of areas that are currently located within the Flood Hazard overlay (1850 m^3/s) but are located behind dikes that provide the same level of protection. Until the berms are constructed to the proper elevation, these areas are not considered to be in the protected flood fringe. Work on future regulations for these areas will be on-going over the next few months, in parallel with the berm construction.

Questions?

Q: When do you intend to write letters advising those property owners that they are now located in the floodway?

A: Much of the Town of Drumheller currently is within the Provincially designated floodway, this has not changed since the Provincial Flood Hazard mapping was published in 2007 (https://floods.alberta.ca/). The Province has indicated that with the upcoming Flood Hazard Mapping update, there will be no new areas designated as floodway.

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Questions?

Q: When will the Town address the residents' concerns regarding de-evaluation of property assessment, insurance and renewal of mortgages for those properties now in the floodway and for those properties that will not be protected by a berm because the Town will run out of dollars? Will the Town allow structures to be rebuilt in the floodway as they were originally built as stated in the exemption letter from the Province dated on June 1 2017?

A: Current Land Use Bylaw state that within the flood conveyance zone, residents are allowed to replace existing buildings or structures in the same location for the same use if they can overcome the flood hazard, subject to acceptance of the Town and a member of APEGA. Residents can also renovate existing buildings as long as they do not increase the floor area below the flood construction level.

*It is also important to note that many properties may increase in value as a result of the flood protection.

DRUMHELLER VALLEY

Questions?

Q: When will the Town address the conflicting information in the Municipal Development Plan with regards to building berms to 1640 m^3/s plus 0.75 m freeboard and 1850 m^3/s plus 0.75 m freeboard?

A: The current Municipal Development Plan, issued in December 2020, refers to the new Provincial 100-year regulatory design flow rate of 1850m^3/s. Of the 23 times the design flow rate is mentioned, there are 2 occurrences where the old, outdated flow rate inadvertently did not get updated. The Town is aware of this and plans to update the MDP for this and a few other typographical errors in spring 2022.
https://drumheller.civicweb.net/filepro/documents/40742

For detailed information on the MDP and LUB, contact Drumheller's Development Office at development@Drumheller.ca

DRUMHELLER VALLEY

Questions?

Q: Where is the berm material coming from if hill dirt is not being used? Is it true the Town is using bedrock to construct the berms as conveyed by the previous flood mitigation officer, Mark Steffler?

A: ParklandGEO Geotechnical Engineering is currently assessing source material.

DRUMHELLER VALLEY

Questions?

Q: When the berms are built in various neighborhoods, is it the Town's intention to have a drainage ditch between the properties and berms so that there is system in place for heavy rains and protection of the houses?

A: Yes. The berm designs will include design of overland conveyance route along the inside toe of the berms.

DRUMHELLER VALLEY

Questions?

Q: When the berms are being constructed and heavy compaction is carried out, who will be covering the damages to house foundations and cracked wallboard that may occur?

A: There will be provisions in the contract documents requiring contractors to undertake the work in a manner to mitigate impacts to adjacent structures in their use of heavy equipment. Pre-construction inspection of adjacent properties may be completed. If any damages occur, they will be reviewed on a case-by-case basis and responsibility assigned according to findings.

Questions?

Q: In the past, mine shafts that run under the river and throughout the Drumheller valley have been inundated by flood / storm water, what is being done to protect residential properties, i.e. from underground flooding?

A: Mine shafts are outside the scope of the current flood mitigation program.

DRUMHELLER VALLEY

Questions?

Q: Are you proposing to abandon one of the Newcastle Ball Diamonds for construction of a berm in this area?

A: No. There are no plans to abandon Newcastle Ball Diamonds for berm construction.

DRUMHELLER VALLEY

Questions?

Q: Why did the Town purchase "flood properties" when they are now being rented out?

A: Purchases of current properties were initiated by property owners. Houses are being rented to offset ongoing monthly maintenance cost until buildings can be removed in spring 2022 .

DRUMHELLER VALLEY

Questions?

Q: What measures are in place for protection of the greenbelt, in particular, the natural native poplar trees?

A: Unfortunately, some trees will need to be removed to facilitate construction. Tree inventories and assessment are completed during design and a 5:1 tree replacement strategy is being implemented.

DRUMHELLER VALLEY

Questions?

Q: It has most recently been stated that the tendering process for berms will commence in January 2022. Will this timeframe inflate the prices for potential bidding as there could potentially be 2-3 feet of snow on the ground? How will contractors view the job in its natural state?

A: No. It is very common to tender work over the winter. Experienced contractors are adept at bidding on projects in the winter. This allows them the ability to be ready to start construction early and have a longer construction season.

DRUMHELLER VALLEY

Questions?

Q: Who are the members on the Flood Mitigation Community Advisory Committee and what have they accomplished to date?

A: The CAC will be introduced at the Midland Town Hall (both virtual and in-person events). They have been undergoing training for the past several weeks.

DRUMHELLER VALLEY

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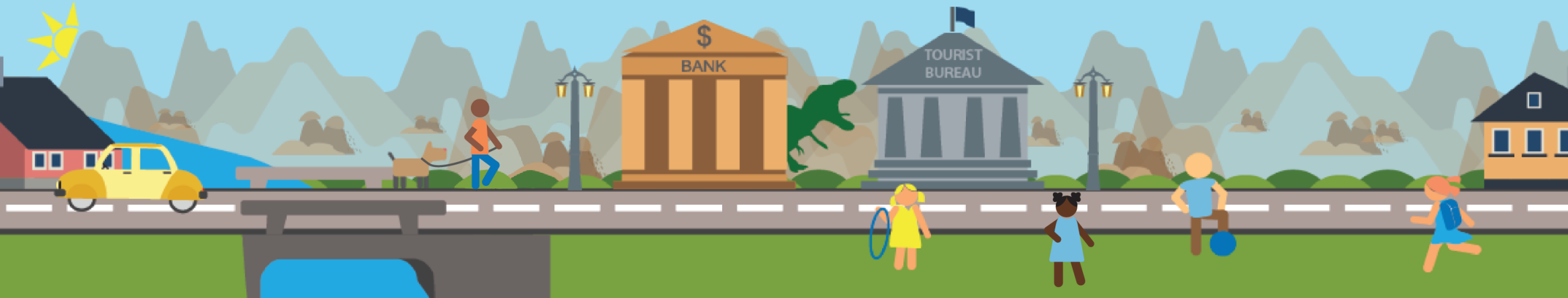

DRUMHELLER VALLEY

Community Advisory Committee

floodcommittee@drumheller.ca