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30 March 2017

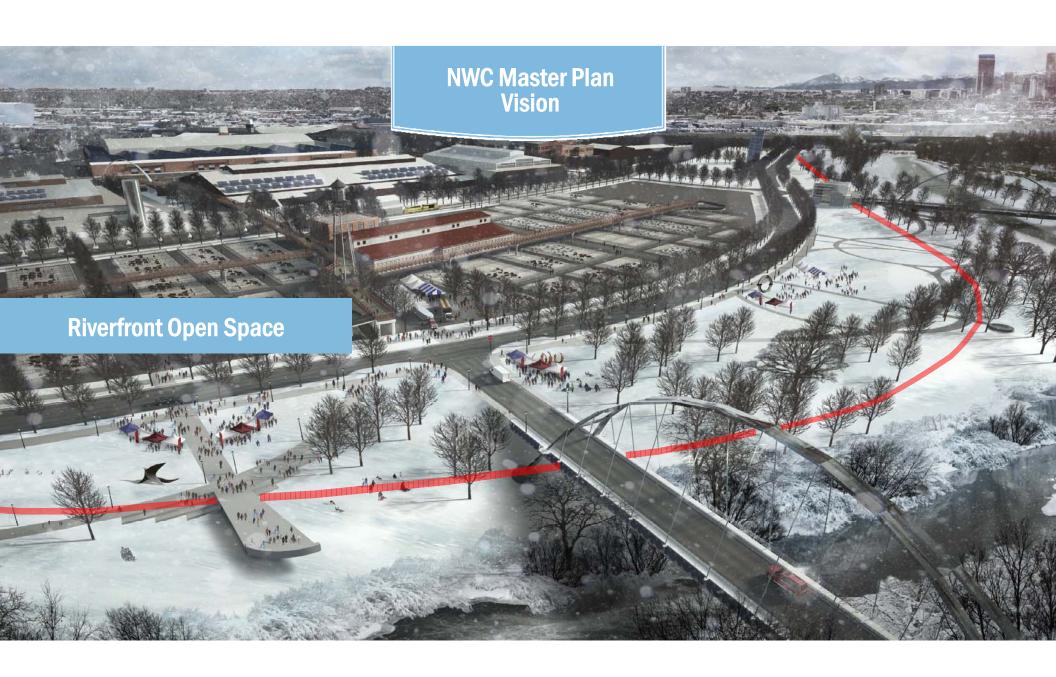
National Western Center Citizens' Advisory Committee

Delgany Interceptor & S Platte River Open Space Study

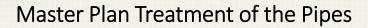
"Engage the River and Nature"



- Create campus-wide connections to the river and natural areas
- On site stormwater treatment / green infrastructure
- Improve habitat along the river
- Link to Heron Pond Natural Area
- Net zero: energy, waste and water
- Watershed / water resources education and research







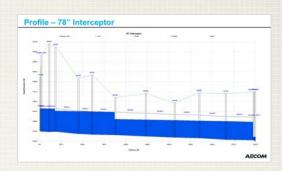


- Per the Master Plan, the pipes remain in place
- No budget to relocate
- Net zero goals for energy, waste and water are aspirational
- Project budget contemplates traditional building systems

Study Goals

1. Delgany Engineering Feasibility Study

Analyze whether the pipes can move elsewhere on the campus.



2. Sewer Heat Recovery Screening Analysis

Is SHR feasible at this location to serve the heating needs of the campus?



3. South Platte Riverfront Study

What are the impacts on the riverfront of various alignments of the pipes?



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Project Team



Office of the National Western Center and Public Works



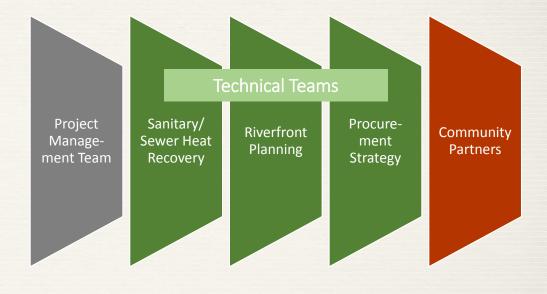
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Riverfront Open Space Study

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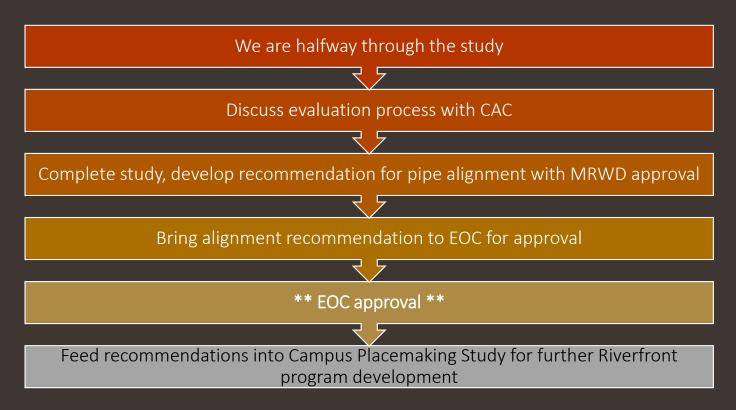
- On-call Contract holder
- Engineering feasibility
- Flood plain modeling
- Sewer heat recovery study
- Cost modeling

Stakeholder Teams





Decision Making Process



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Delgany Interceptor Engineering Feasibility



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Delgany Pipeline Engineering Feasibility

Constraints

- "No Rise" Requirement for 100-yr floodplain elevation
- MWRD
 - Interceptor Maintenance Access
 - Design Requirements
- Existing Delgany Features
 - Flow Control Manhole
 - South Platter River Siphon
- NWC Master Plan
 - Surface Features
 - Buried Utilities



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Delgany Interceptor – Engineering Feasibility

Analyses	Status	Findings
Delgany Hydraulic AnalysisExistingNew alignments	CompletedInitial calculation completed	Capacity confirmedNo reasonable limit
Delgany Structural Integrity Evaluations	In Progress	
South Platte River Hydraulic Modeling	In Progress	

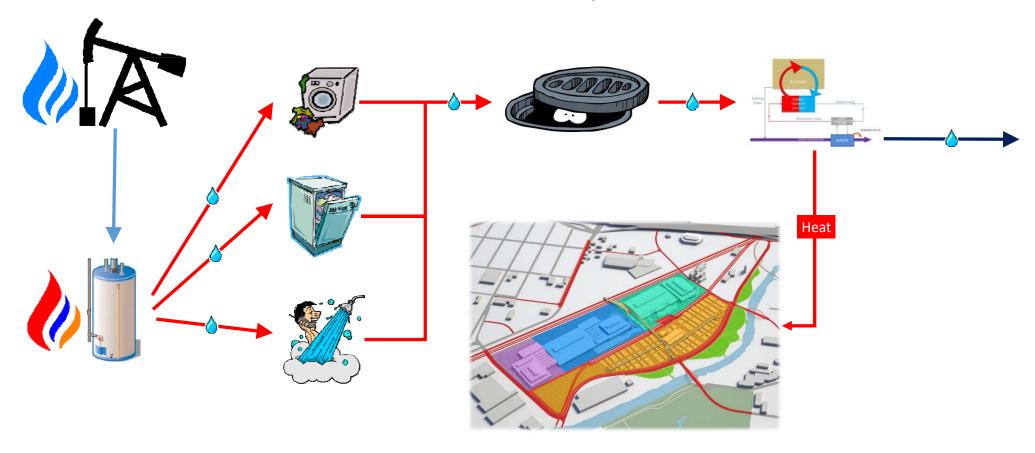
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Sewer Heat Recovery





Sewer Heat Recovery 101



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Delgany Interceptor – Sewer Heat Recovery

Opportunities/Challenges

- Opportunity Helps MWRD with thermal pollution discharges
- Opportunity Proximity of Delgany Interceptor to NWC
- Opportunity Supply Capacity is sufficient to heat the entire NWC campus
- Opportunity May be used for both heating and cooling
- Opportunity Planning NWC infrastructure development
- Challenge Minimize Sewer Heat Recovery footprint and impacts
- Challenge Early coordination and integration with HVAC System Designs is Needed
- Challenge Financing of initial capital costs



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Delgany Interceptor – Sewer Heat Recovery



Next Steps

- Sewer Heat Recovery looks extremely promising for this site, based on supply and characteristics
- Complete the thermal supply and demand analysis to refine alternatives for SHR recovery
- Complete the high level screening analysis of SHR options
- Analyze costs, both capital and life cycle
- Develop financial pro forma to understand net present value and return potential of a system

NATIONAL WESTERN CENTER LOCAL IMPACT . GLOBAL REACH Riverfront

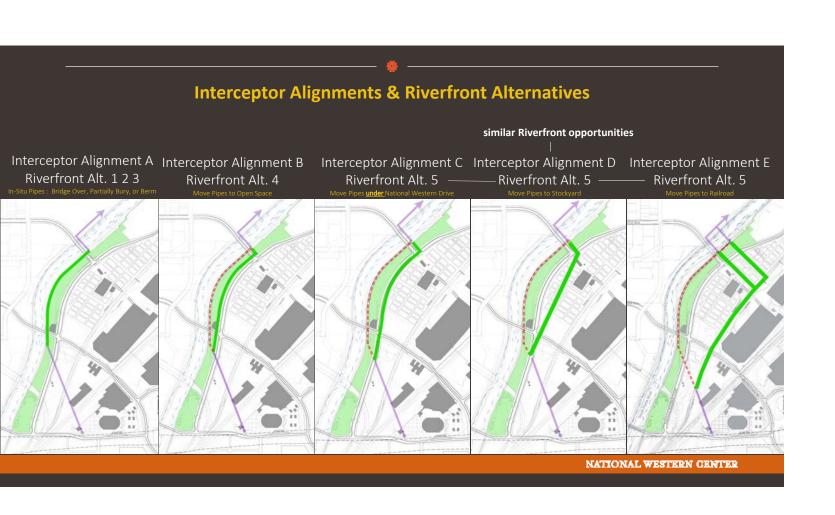
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Our Goal – Riverfront Concept

To understand the impact of the Delgany relocation and in situ alternatives on our ability to create open space along the river within the NWC campus.

Interceptor Alignments & Riverfront Alternatives

Interceptor Alignment	Riverfront Alternative
A. In Situ – remains in its current location	Pipe remains exposed, and is bridged over
	2. Partially buried on the east side
	3. Fully buried; "bermed" over
B. Pipes moved to the east, but still within the open space	4. Fully buried within the eastern portion of the open space
C. Under National Western Drive	5. Pipes out of the open space
D. Under the Stock Yards	
Under or adjacent to the consolidated rail corridor	



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Evaluation Criteria — Riverfront Alternatives

Fatal Flaw Analysis

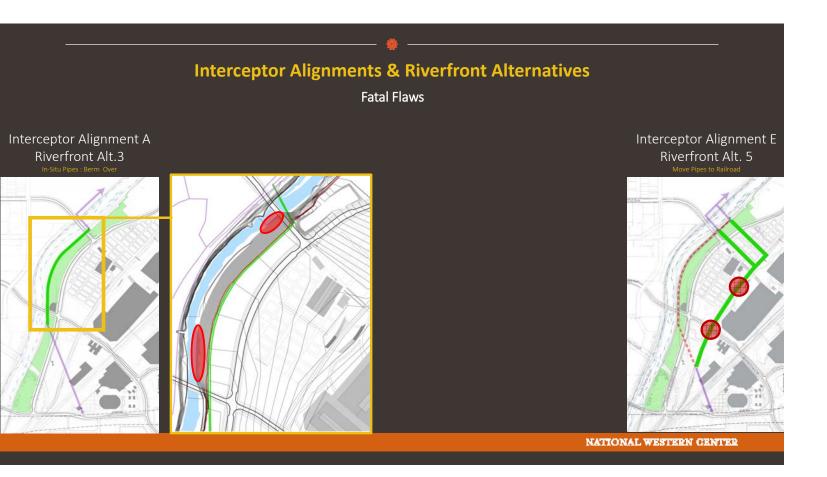
- Floodplain Impacts
- MWRD Maintenance Access
- Cost
- General Feasibility

Visitor Experience

- River Access
- Safety & Accessibility
- Habitat Restoration
- Odor Control

Conformance with the NWC Master Plan

- Master Plan Program
- Water Quality Needs
- Landscape Impacts
- Program Area Opportunities





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Riverfront Alternative 1 In-Situ, Bridge over pipes

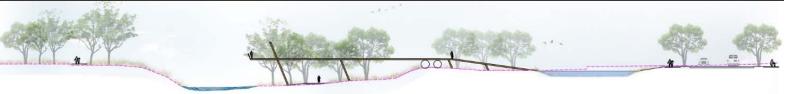


trail paths ~ 85,000 sq.f ramps / stairs boardwalk path skywalk path
open space ~ 60,000 sq.ft.
water quality



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Riverfront Alternative 1 In-Situ, Bridge over pipes







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Riverfront Alternative 2 In-Situ, Pipes buried on the east side only, with Walking Surface above



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Riverfront Alternative 2 In-Situ, Pipes buried on the east side only, with Walking Surface above





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Riverfront Alternative 4 Pipes moved into Open Space



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Riverfront Alternative 4 Pipes moved into Open Space



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Riverfront Alternative 5 Move Pipes under National Western, under Stockyards, or within Rail Corridor



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Riverfront Alternative 5 Move Pipes under National Western, under Stockyards, or within Rail Corridor





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Interceptor Alignments & Riverfront Alternatives

Next Steps

- Complete alternatives analysis, including floodplain modeling
- Run evaluation process using criteria listed previously
- Finalize draft recommendations

