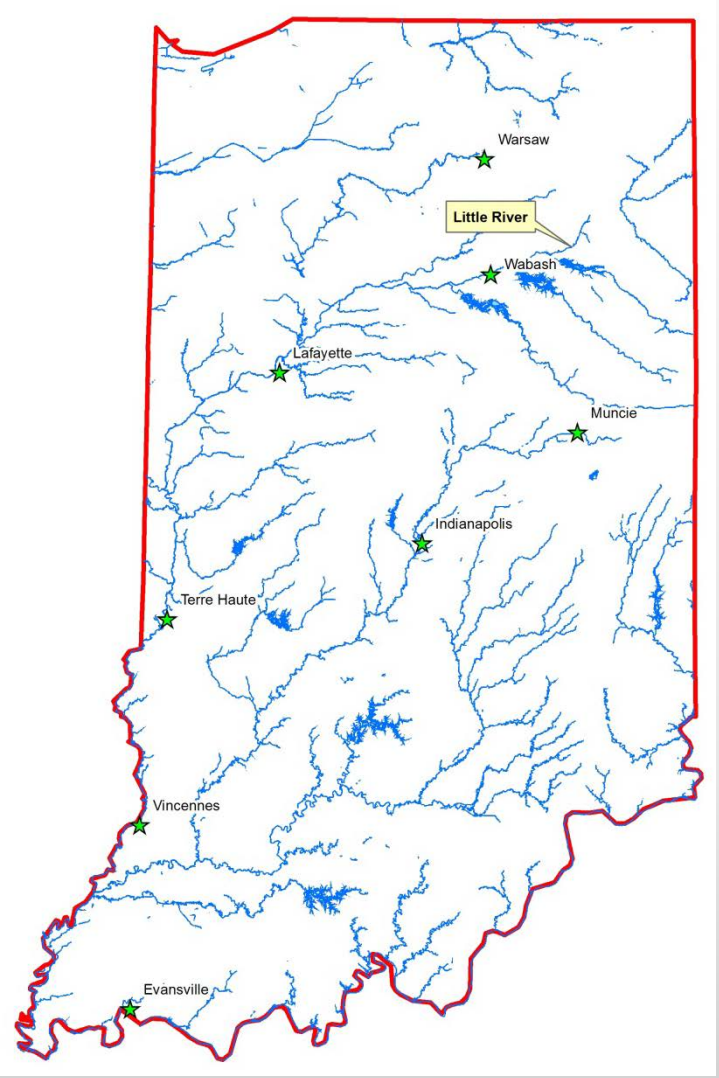
Huntington Mill
Low Head Dam Removal Project

Bryn Keplinger, CFM

Director of Community Development & Redevelopment

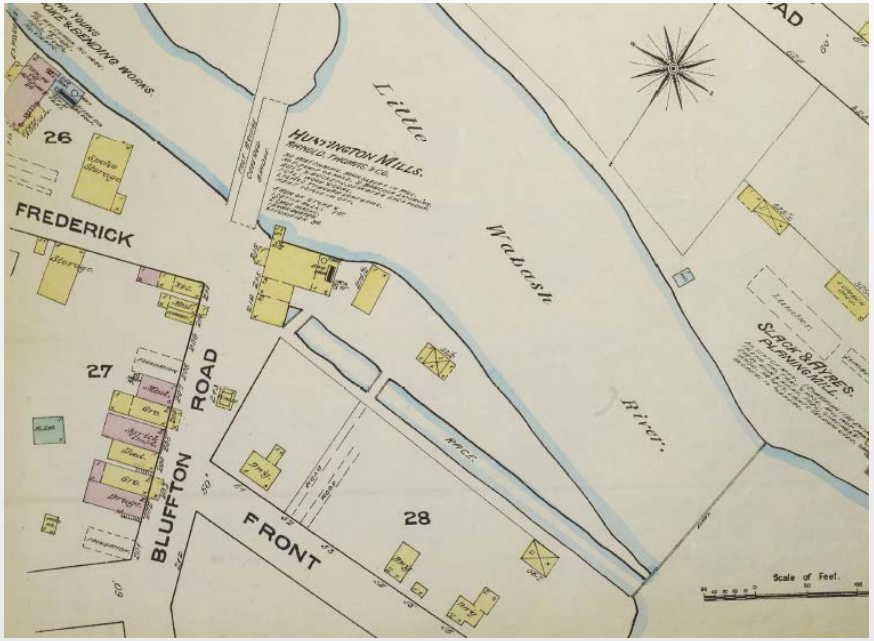
Background

- Little River
  - Length: 22.6 miles
    - Allen & Huntington Counties
  - Drainage area: 287.9 sq mi
    - Allen County
    - Huntington County
    - Wells County
    - Whitley County
  - Tributary to the Wabash River



Background

- 1861
  - Huntington Mill Dam built
    - Huntington Flouring Mill built
    - Construction cost: $15,000
      - Flour mill
      - Raceway (sluice)
      - Timber-crib dam
  - Original Construction
    - Built with a four post construction or cribbing technique. Timber cribs were erected with heavy timbers or dressed logs in the manner similar to log home construction, with the interior then filled with earth or rubble. The heavy crib structure supported the dam's face and the force of the water.



Background

- 1911 Photographs
  - A: View upstream
  - B: View from south bank
  - C: Upstream - dam and race

Background

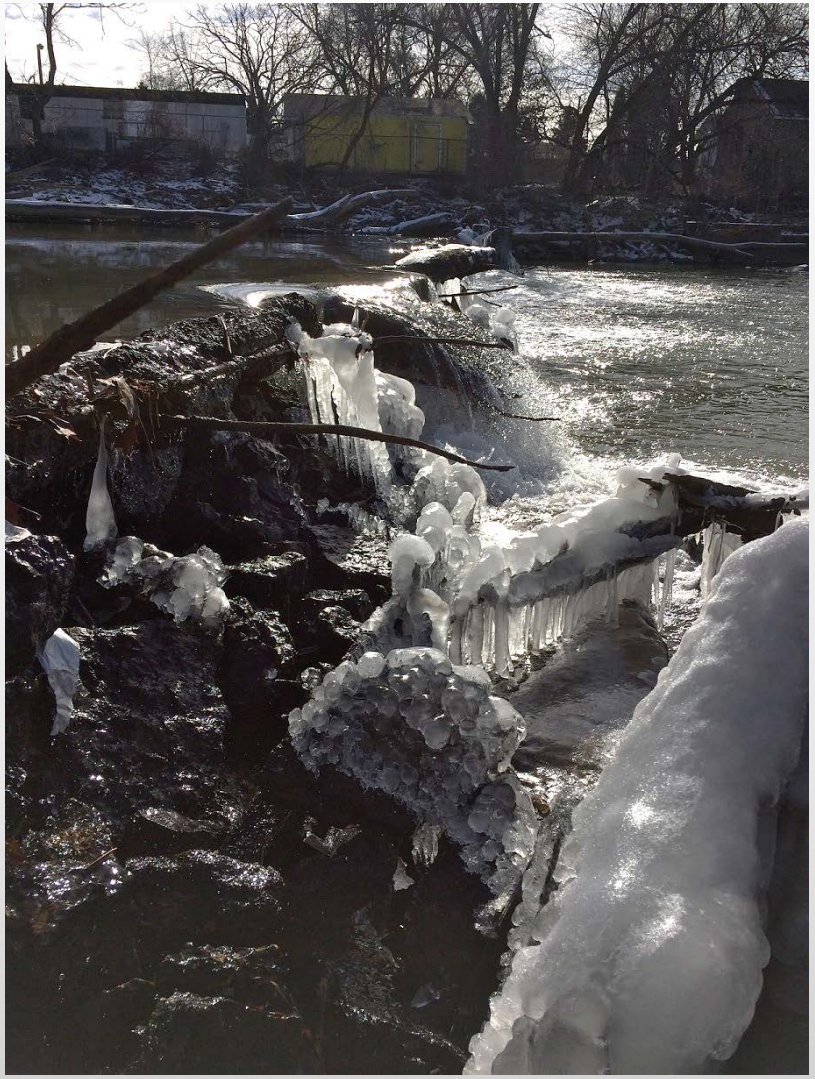
- Post 1911
  - Timber crib dam upgraded to 10'x145' concrete weir. Timber crib used as concrete form for upstream side.
- May 29, 1939 – Mill Fire
  - Raceway later filled in

Dam Failure

- January 2016
  - Unseasonable conditions: warm + heavy rains = high flows
  - Collapse of all but 30' extending from the south bank
  - Water level dropped 2'+ upstream
  - Exposed concrete wood, and rebar
  - Upstream apron intact
  - City immediately contacted DNR (DOW & F&W) for consultation and possible assistance

Dam Failure

Dam Failure



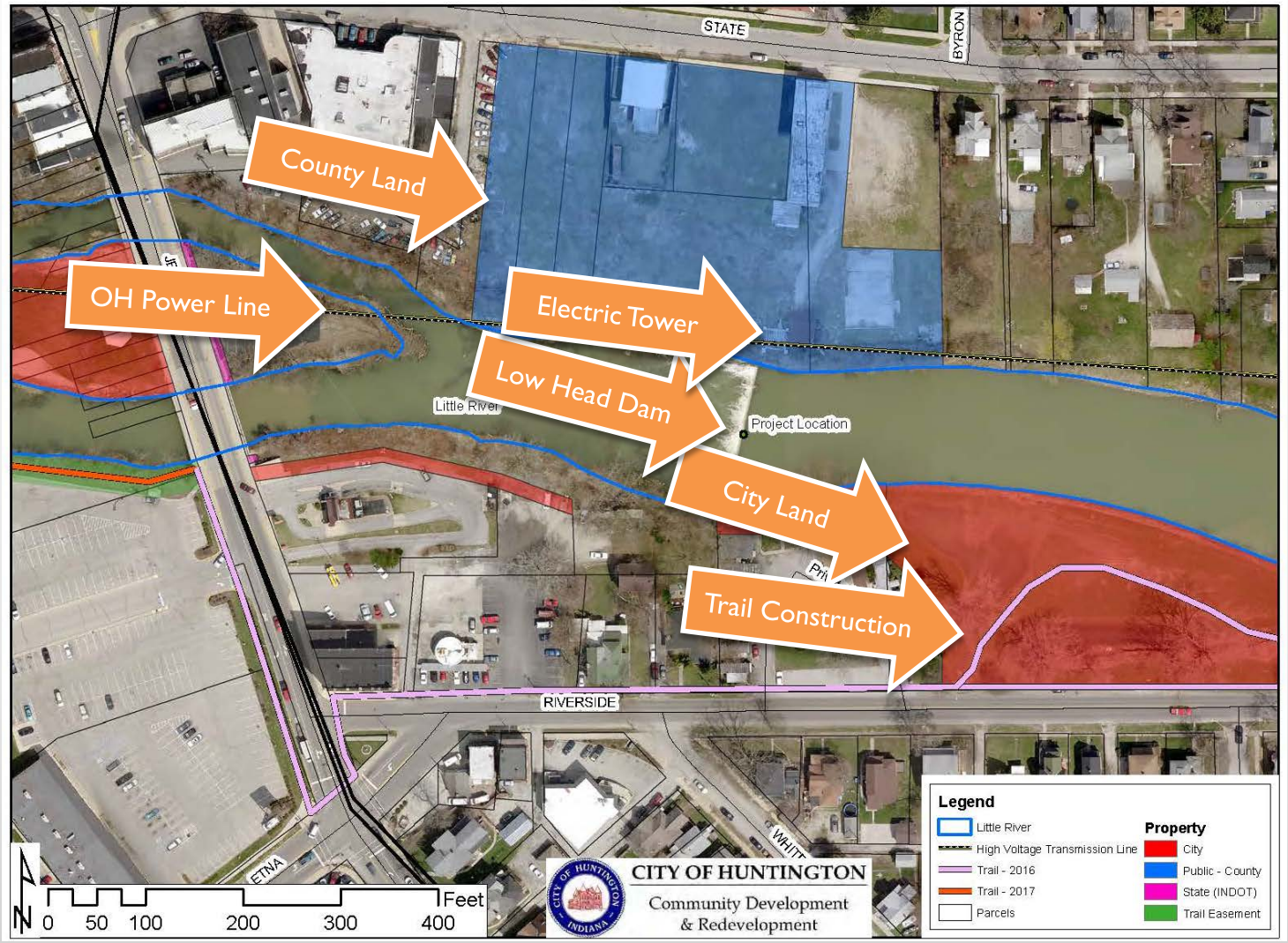
Early Signs of Failure

- 77 years without responsible ownership or maintenance
  - DNR-DLM noted signs of failure in early 2000's as they stepped up efforts to survey / inventory non high-hazard dams
    - Visible signs: notching, cracking, seepage, and spalling
    - Non-visible: logjam impacts and minimal rebar

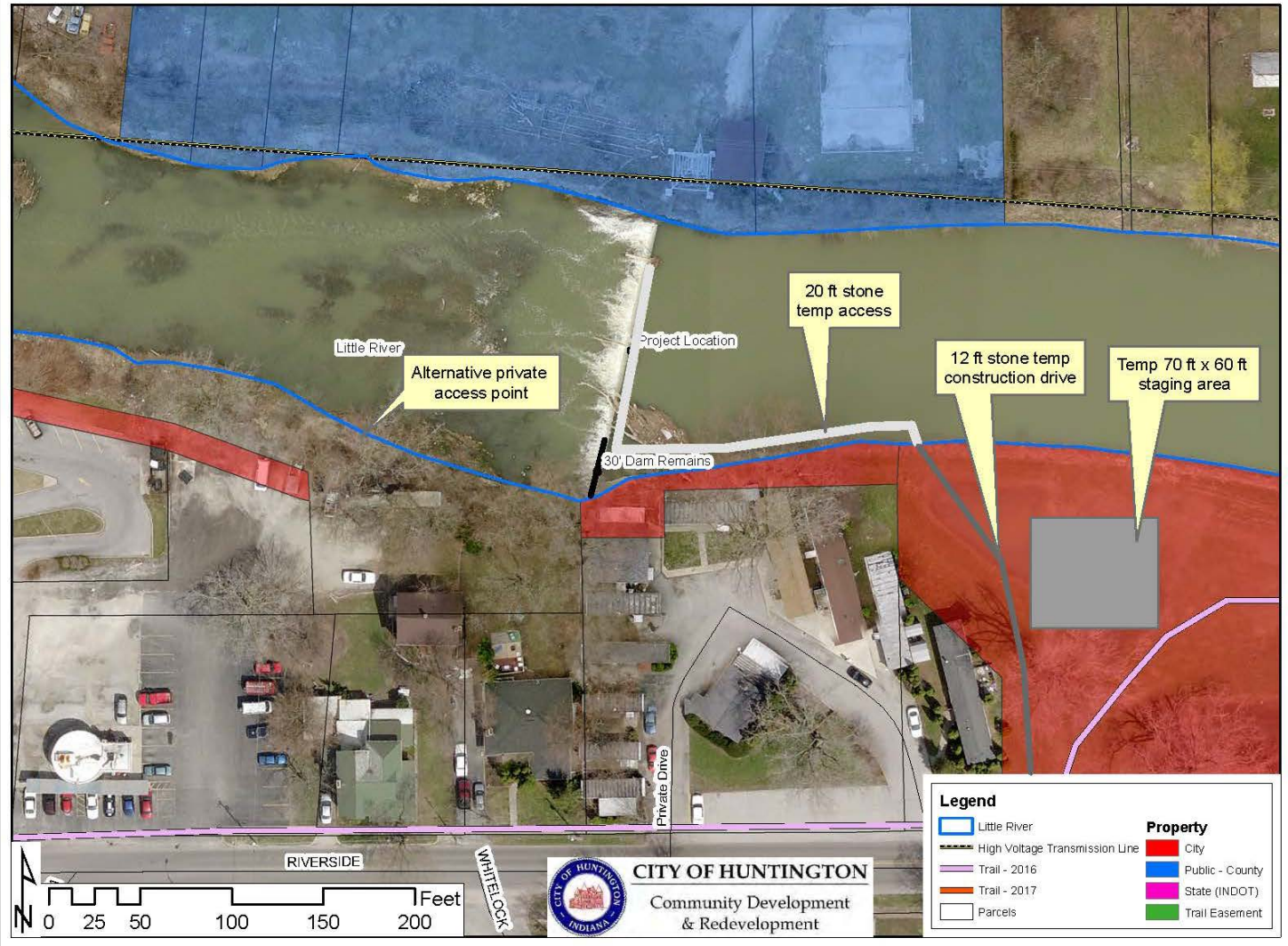
DNR Proposes a Solution

- LARE (Lake And River Enhancement) Program
  - 80/20 matching grant
  - Applications due January 31 (20 day window)
  - Numerous site visits & conference calls
  - City makes application – requesting $83,805.60 (80% on 1/27)
- Initial game plan developed
  - City conducts in-channel survey
  - South access favored
    - Temporary drive
    - 20' wide stone access
    - 30' dam remains (historic value)
  - Contractor estimate: $104,757

Project Location

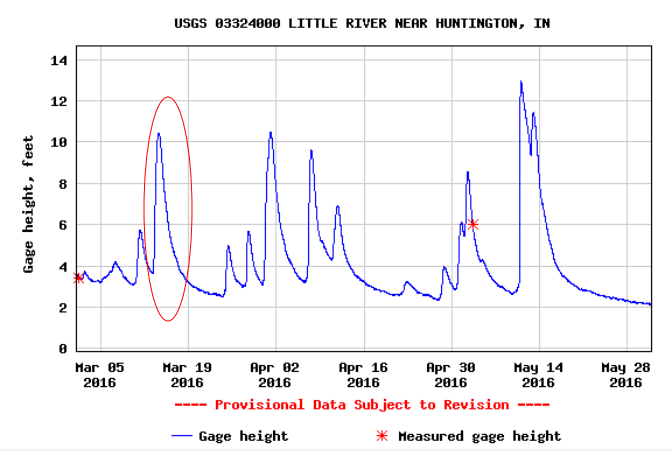


Preliminary Plan



Seasonal Flows

- Spring melt gives the site a first flush



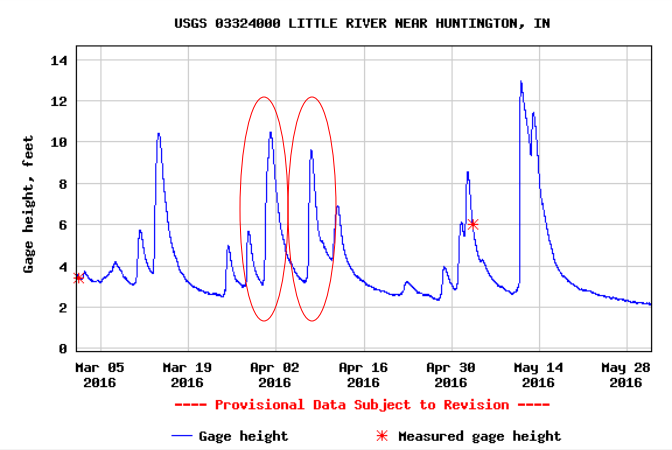
3/10/2016

3/14/2016

3/22/2016

Seasonal Flows

- … and a second and third flush



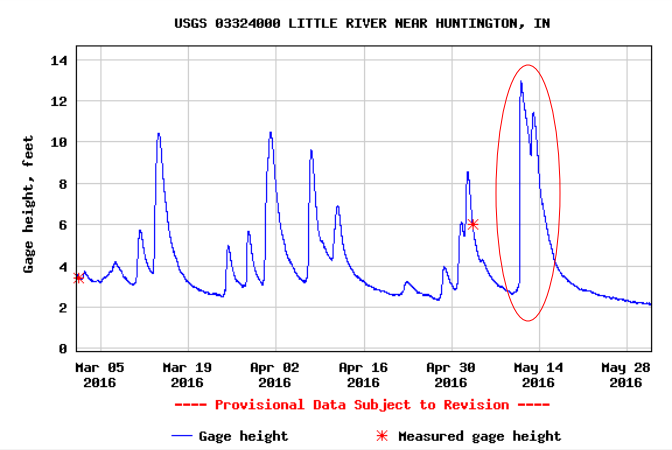
4/1/2016

4/4/2016

4/7/2016

Seasonal Flows

- … and the flushing continues



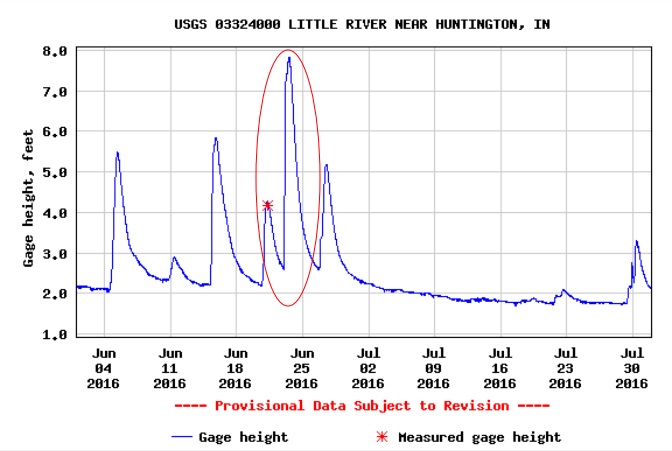
4/15/2016

5/11/2016

5/25/2016

June & July Flooding

- The two-month flood event proved to be problematic across most of Indiana



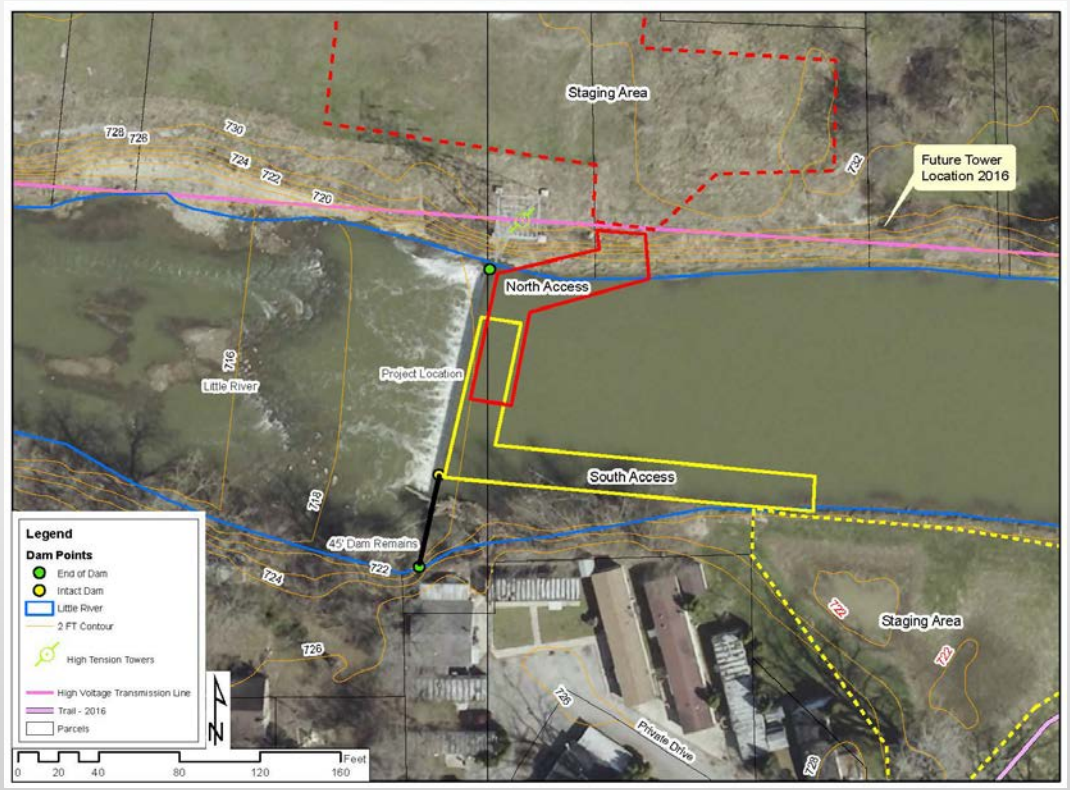
6/20/2016

6/23/2016

7/30/2016

The Stars Align – Two Options Emerge

- Duke Energy to relocate tower before dam project
  - North access becomes a viable option
- Dam continues to degrade – cyclical flooding
  - Sediment release
  - Water level lowers
- Early coordination meetings occur
  - Duke, USACE, IDEM
  - DNR:
    - DHPA
    - DOW
      F&W

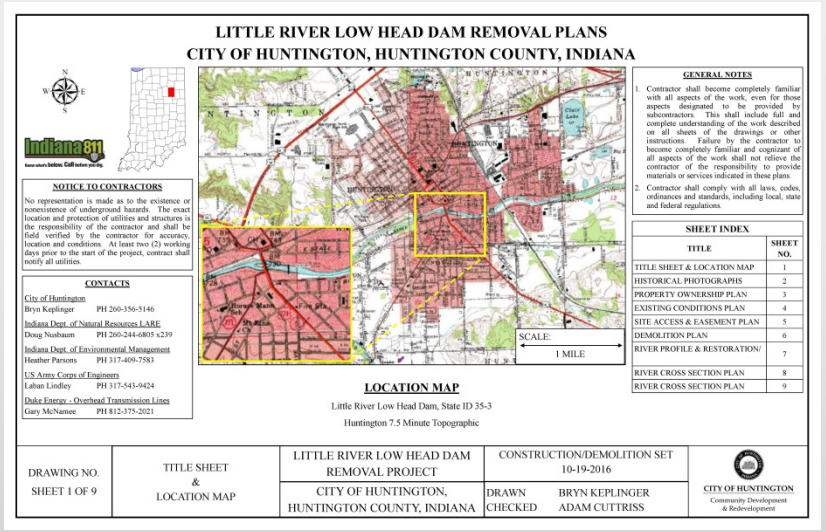


Grant Awarded & Permitting Begins

- July 15, 2016 – funds awarded for "design-build" project
  - $ 80,000 DNR
    $ 20,000 City
    $100,000 Est. project
  - City decides to administer grant internally and not engage a consultant to assist with permitting.
    - DNR-DHPA Section 106 (NAE) 9/13/2016
    - USACE Section 404 & Section 10 (NWP27) 9/20/2016
    - IDEM Section 401(WQC) 9/20/2016
    - DNR-DOW Floodway Permit 10/18/2016
    - Huntington Local Floodplain Permit 10/18/2016
  - Other approvals: Duke Energy easement access, County right of entry

Project Plans Formulated

- Guidance from DNR-DOW & F&W staff was invaluable
- Plans were completed in two phases by City staff
- 1. Permitting Plans:
  - Pre-grant award, general scope, allowed north or south access, with archeological documentation assumed to be required.
- 2. 'Construction' Plans:
  - Post grant award, incorporated specific permit requirements
  - made use of new data gathered from the very dynamic site.


LITTLE RIVER LOW HEAD DAM REMOVAL PLANS
CITY OF HUNTINGTON, HUNTINGTON COUNTY, INDIANA

NOTICE TO CONTRACTORS

No representation is made as to the existence or nonexistence of underground hazards. The exact location and protection of utilities and structures is the responsibility of the contractor and shall be field verified by the contractor for accuracy, location and conditions. At least two (2) working days prior to the start of the project, contract shall notify all utilities.

CONTACTS

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Doug Nusbaum PH 260-244-6805 x239
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Heather Parsons PH 317-409-7583
US Army Corps of Engineers
Laban Lindley PH 317-543-9424
Duke Energy - Overhead Transmission Lines
Gary McNamee PH 812-375-2021

SCALE: 1 MILE

LOCATION MAP
Little River Low Head Dam, State ID 35-3
Huntington 7.5 Minute Topographic

GENERAL NOTES

1. Contractor shall become completely familiar with all aspects of the work, even for those aspects designated to be provided by subcontractors. This shall include full and complete understanding of the work described on all sheets of the drawings or other instructions. Failure by the contractor to become completely familiar and cognizant of all aspects of the work shall not relieve the contractor of the responsibility to provide materials or services indicated in these plans.
2. Contractor shall comply with all laws, codes, ordinances and standards, including local, state and federal regulations.

SHEET INDEX

TITLE	SHEET NO.
TITLE SHEET & LOCATION MAP	1
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EXISTING CONDITIONS PLAN	4
SITE ACCESS & EASEMENT PLAN	5
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RIVER PROFILE & RESTORATION/	7
RIVER CROSS SECTION PLAN	8
RIVER CROSS SECTION PLAN	9

DRAWING NO. SHEET 1 OF 9	TITLE SHEET & LOCATION MAP	LITTLE RIVER LOW HEAD DAM REMOVAL PROJECT	CONSTRUCTION/DEMOLITION SET 10-19-2016	CITY OF HUNTINGTON Community Development & Redevelopment
		CITY OF HUNTINGTON, HUNTINGTON COUNTY, INDIANA	DRAWN BRYN KEPLINGER CHECKED ADAM CUTTRISS	

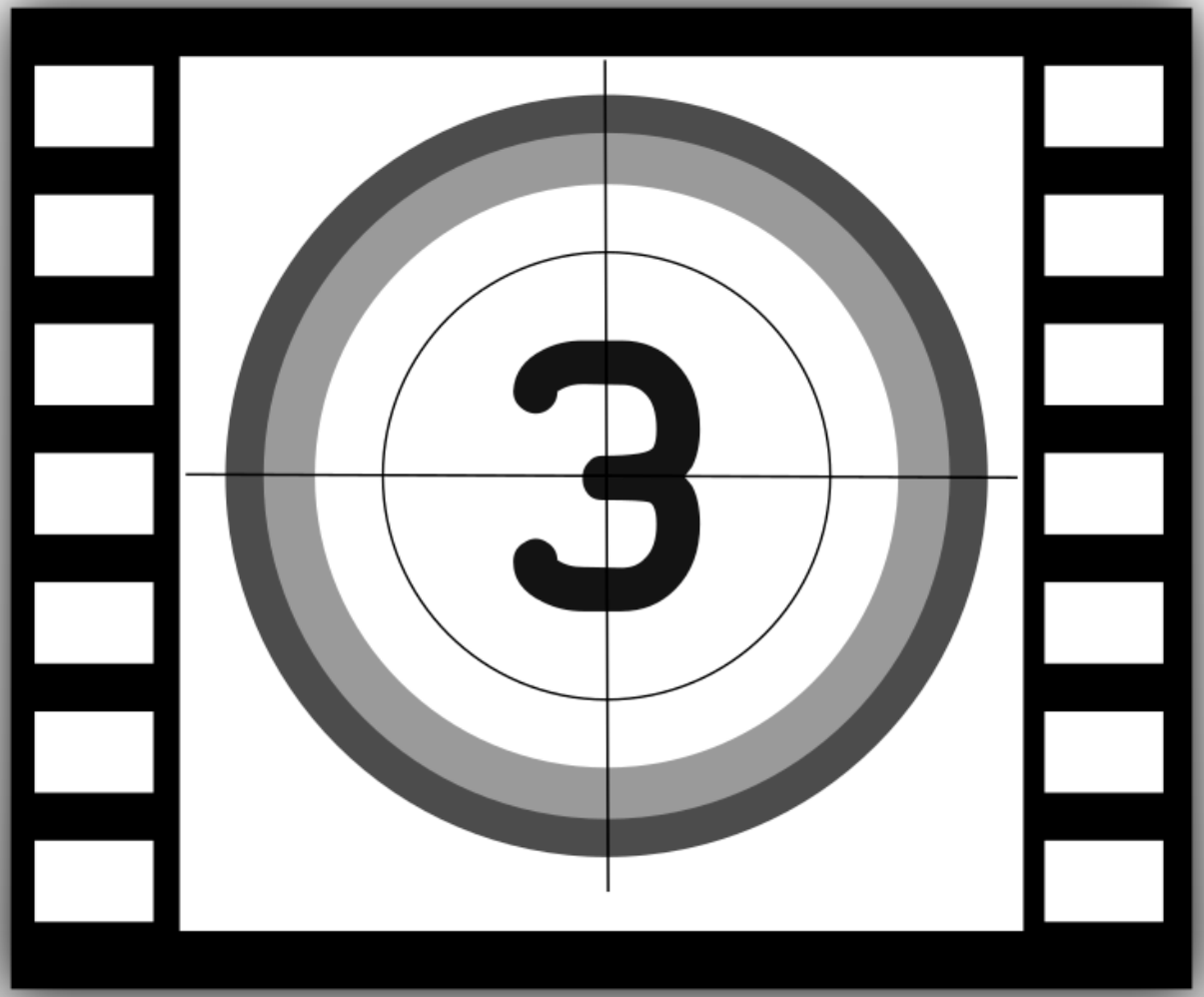
Project Costs

- 11/7/2016 – City receives proposals for project:
  - 7 contractors solicited for quotes (10/19/2016)
  - 4 quotes received from contractors
    - Ranged from $42,757 to $139,750 – 59% savings
  - Two significant factors impacted costs
    - Duke Energy pole relocation made north access more practical
      - Construction of a south access road was labor and material intensive
    - Continued degradation of the dam due to high flows
      - Eliminated concerns about sediment release and broke up large pieces of the dam into much more manageable sizes
  - Ironclad Excavating awarded project
    - Cardno subcontracted for archeological documentation plan
    - Archeological work plan approved by DHPA on 11/28/2016

Demolition Begins

- Ironclad began demolition work on 12/12/2016
- Work completed in two days under low flow conditions
  - Access from north bank with temporary rip-rap
  - Remaining dam cut back to within 12' of south bank

Project Time Lapse



Project Complete

Upstream

Across Channel

Downstream

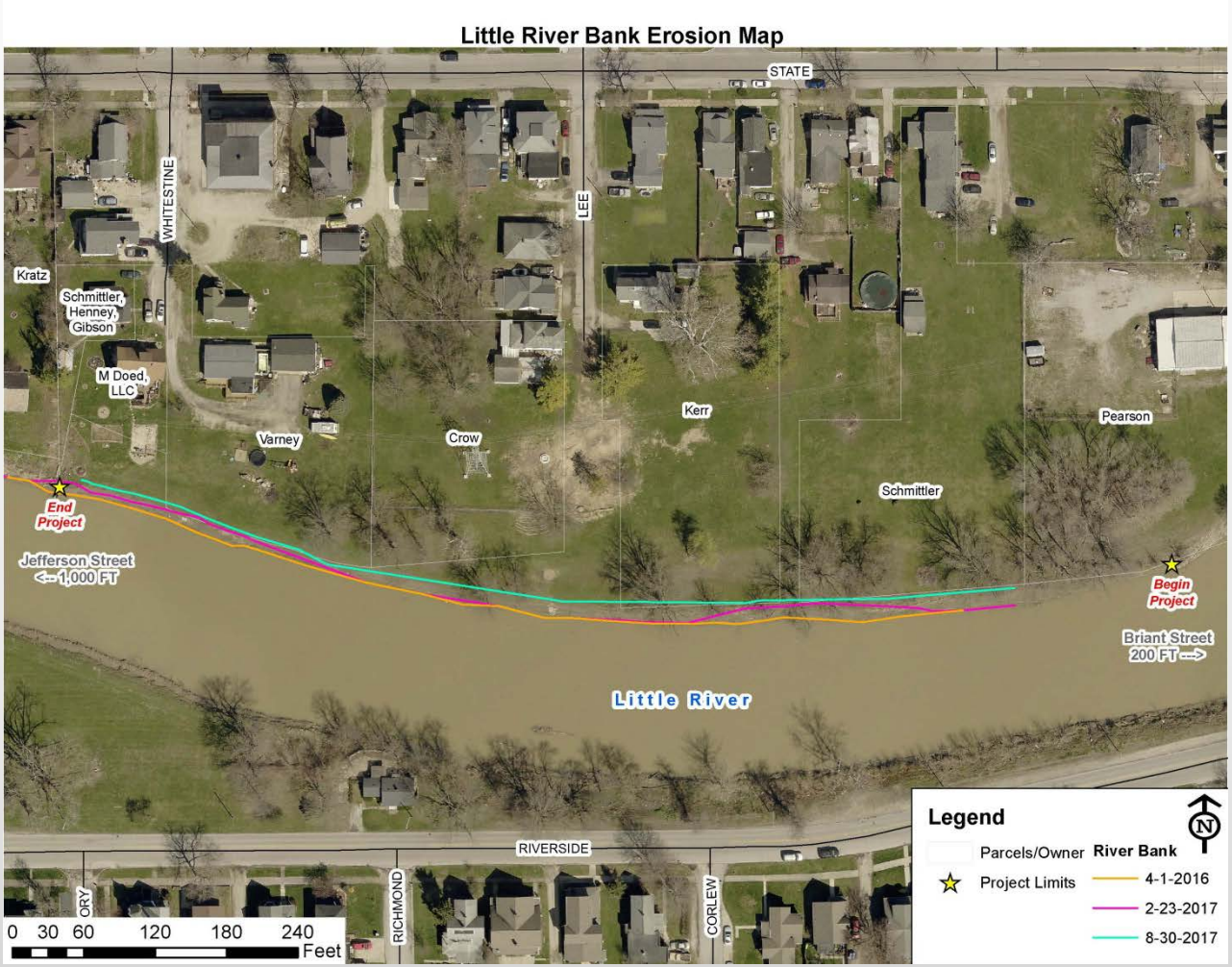
Project Complete

Unintended Consequences

- 1,000 ft impacted
- 6 - 20 ft bank loss
- North bank only
- LARE Grant pursued

Unintended Consequences

- 2017 LARE grant – bank stabilization
- $100,000 total project
- 8/31 RFP issued
- 9/18 receive quotes



Lessons Learned

- State and federal partners are key to project success
- Permit process was time consuming – lacked fast track process for removal of crippled/failed man made structures
  - NWP 53 – New permit covers removal of LHD's as of 3/19/17
  - Hopefully this new NWP will lead to similar action at the state level
- Hard to predict how the river will respond
  - Biotic habitat, water quality, and sediment transport improvements are widely accepted as known LHD removal benefits
  - Bank composition, erosion, and channel adjustment/flow migration are difficult to fully anticipate and are heavily dependent upon the size and frequency of future high flows
- Upstream vegetation: would immediate post-project seeding and plantings have combated bank erosion?
- Public perceptions: people alive today have never seen the natural river – "dirty, dry, and safe from flooding"

Thanks!

- Department of Natural Resources
  - Division of Fish & Wildlife – LARE
    - Greg Biberdord, Program Supervisor
    - Doug Nusbaum, Program Specialist
  - Division of Water
    - Traci Powell, Section Manager
    - Dave Nance, Engineering Geologist
  - Division of Historic Preservation and Archeology
    - Cathy Williams-Draeger, Archeologist
  - US Army Corps of Engineers
    - Laban Lindley, Team Leader-Indianapolis Regulatory Office
  - Indiana Department of Environmental Management
    - Heather Parsons, Environmental Manager-OWQ

DNR
Indiana Department of Natural Resources

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Questions?