- Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant or contaminant.

- Cleaning up and re-investing in these properties protects the environment, reduces blight, and takes development pressure off green space and working lands.

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●BCRC Brownfield Redevelopment Program 2006-2018

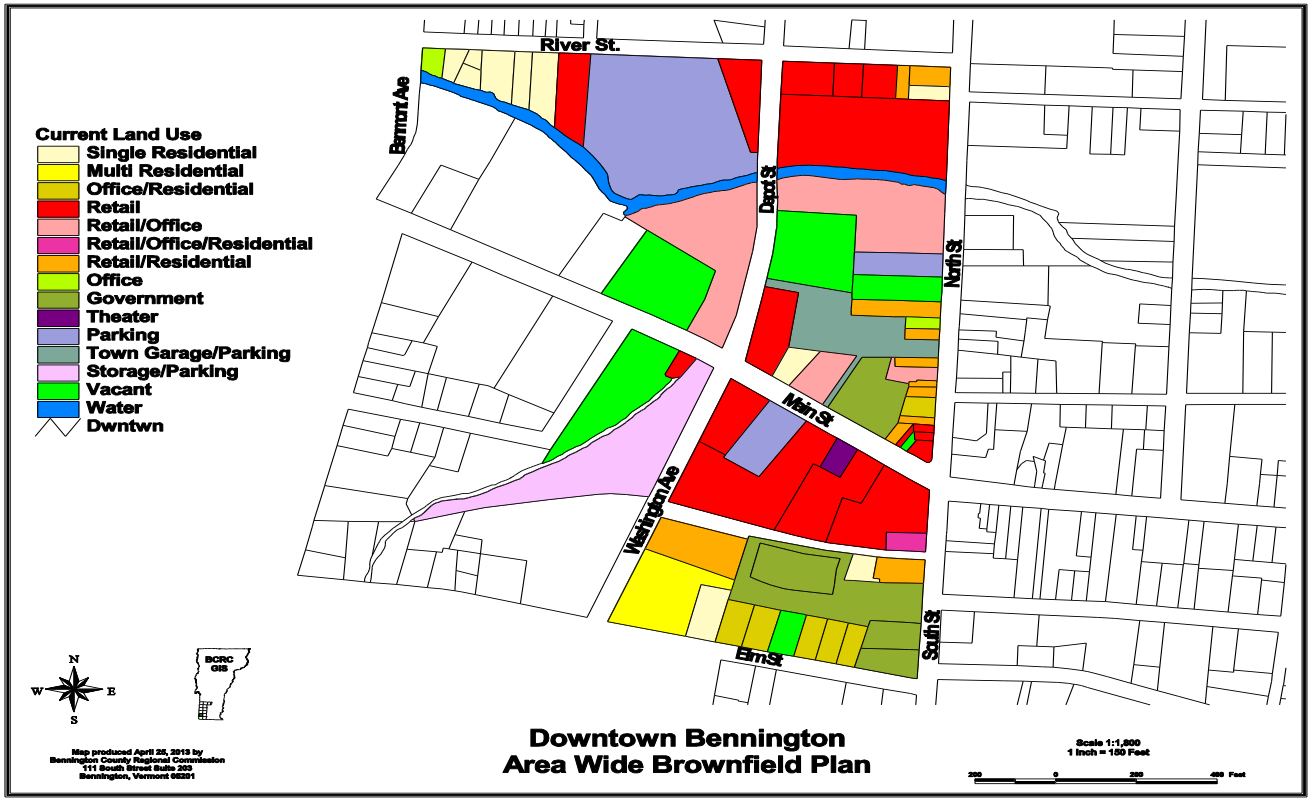
●2010 - 2017 Assessment Grants

●$400,000 Hazardous Substance Assessments
●$256,000 Petroleum Substance Assessments

●3 Phase 1 Environmental Site Assessments
●4 Phase 2 Environmental Site Assessments
●4 Corrective Action Plans
●2 Redevelopment
●Downtown Bennington Area-wide Plan

BCRC

- Downtown Bennington Area Wide Brownfield Plan



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- Saint Paul's Church, Manchester

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- Bernstein Display, Shaftsbury

- Mack Molding, Pownal

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- P&S Garage, Arlington

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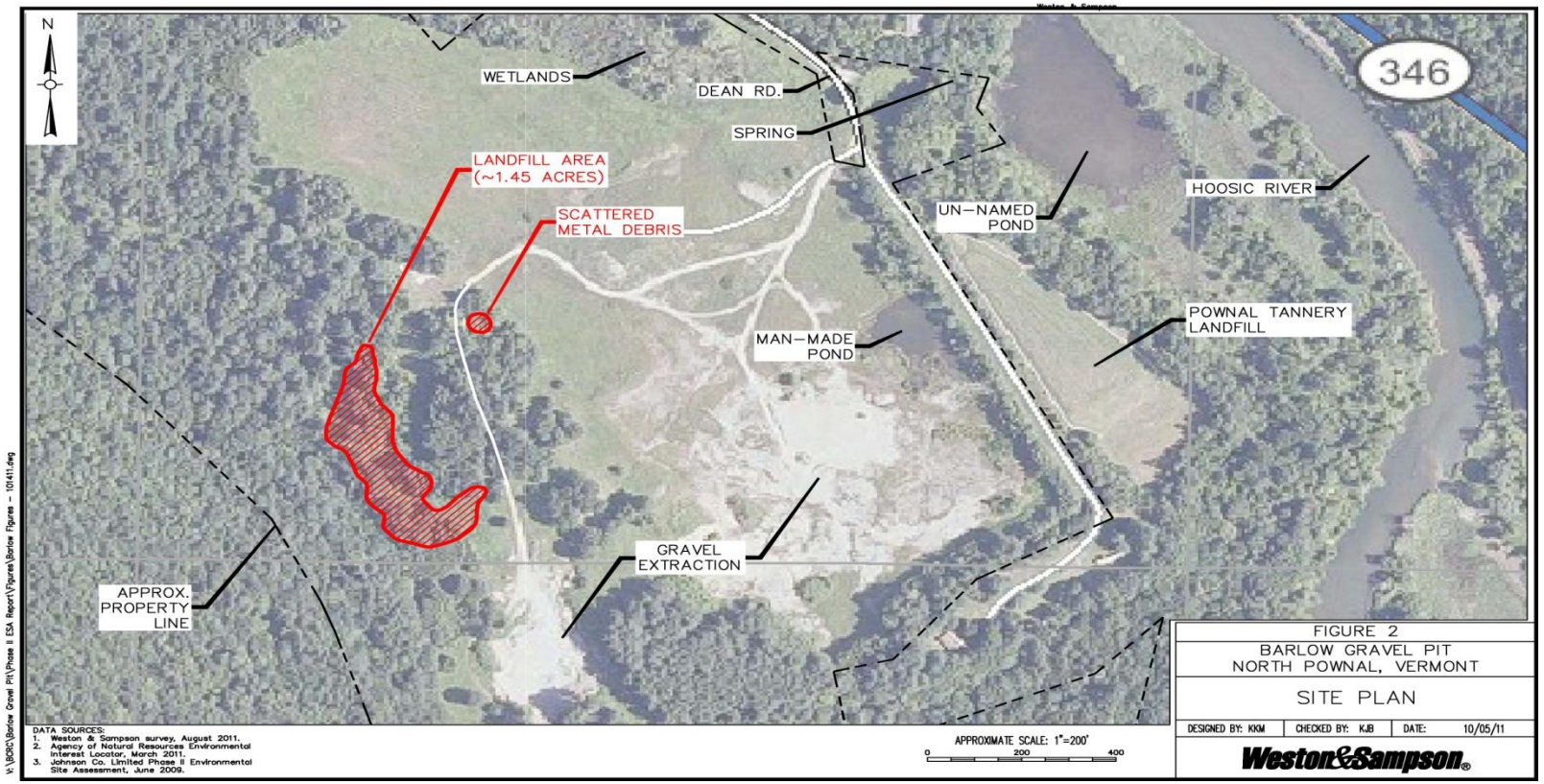
●Barlow Gravel Pit, Pownal



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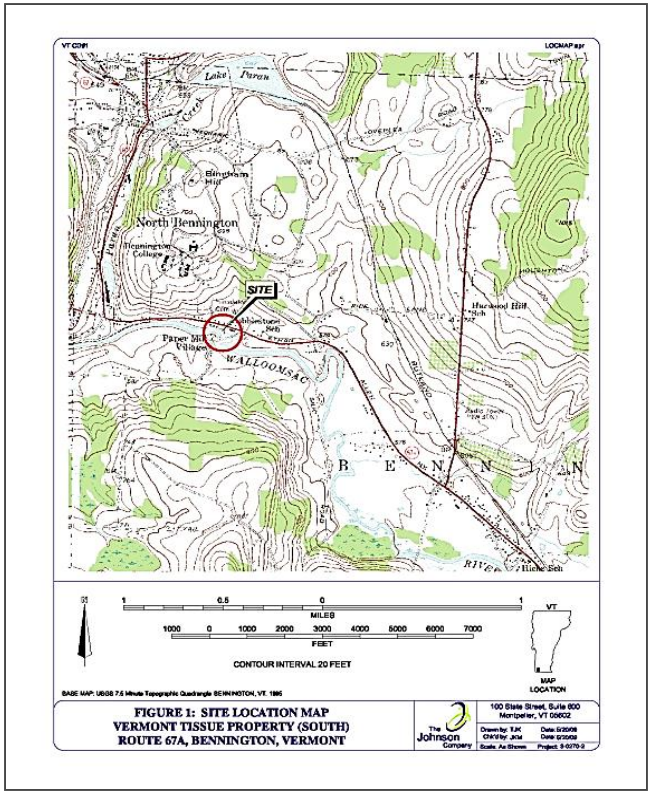
- Alcaro Motors, Bennington

- Vermont Tissue North, North Bennington

Case Study
Vermont Tissue South

- Location / Setting



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Vermont Tissue South Site Background

- The Bennington Valley Pulp Co. burnt to the ground in 1886.
- The current mill built in 1887
  - 12,000 square feet
  - 20 foot high ceilings
  - Constructed of concrete, brick, and glass
- Paper manufacturing operations produced low quality tissue paper until the early 1990s.

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Other Site Features

- 2.3 Acres (mill site, dam and island with a trail system and river access)
- Paper Mill Covered Bridge built in 1889
- 85 foot concrete dam built in 1889 with a 17 foot head.

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The Johnson Company Completed Phase I ESA Update, June 2009

A total of eight (8) **Recognized Environmental Conditions** were identified that required additional assessment.

They included:

- Pole Mounted **Transformers**
- Former 10,000-gallon fuel oil **UST**
- Process Water **Piping** (containing residual pulp)
- Potential presence of **lead based paint**, **asbestos containing material**, and **PCB-containing building materials**
- Containerized **Hazardous Materials**
- **Floor Drains**
- Potentially **Impacted River Sediment** Impounded by Dam

-and-

The Johnson Company

Dioxin/Furans/PCBs on Interior Surfaces

Residual Paper Pulp known to contain dioxin/furans

PCB contamination suspected

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Phase II Investigation Objectives:

1. Characterize sediment impounded by the Dam;
2. Evaluate sediment mobilization, in the context of proposed dam rehabilitation.
3. Address the data gaps identified in The Johnson Company's Phase I ESA Update as a Supplemental Investigation focusing on Mill Building

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Sediment Characterization – In anticipation of hydroelectric generation

Bathymetry assessment

Deep Sediment Coring

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Sediment Conclusions:

Mobilization Evaluation:

- Using the bathymetry data, USGS gauge information, and a series of calculations we preliminarily determined that there would be a nominal increase in downstream sediment migration that would result from the proposed diversion of approximately 200 cfs through the hydroelectric generation turbines

Dredging:

- Only localized hydraulic dredging is required in advance dam rehabilitation
- Dredged sediment likely contains PAHs and metals in exceedance of applicable standards and therefore needs to be managed appropriately

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Supplemental Phase II – Mill Building

Groundwater sampling

near former 10K UST

Conclusion: *No detectable deep groundwater impacts related to former 10,000 gallon fuel oil UST,*

no action required

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Supplemental Phase II – Mill Building

Floor Drains

sediment and sub-slab soil sampling

***Conclusion**: Floor drain material impacted, requires clean-out and permanent decommissioning*

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Supplemental Phase II – Mill Building

Hazardous Waste Inventory

Conclusion: *Inventory completed, disposal cost estimate prepared*

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Supplemental Phase II – Mill Building

PCB Sampling – Bulk Concrete near aging electrical equipment and stained areas

Conclusion *– PCB detections ranged from ND - 4.3 ppm (triggered TSCA, but determined exempt)*

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Supplemental Phase II – Mill Building

Pulp Sampling

Conclusion *– Confirmed to contain PCBs (< 5 ppm), Dioxins confirmed during 2008 Investigation, requires removal And appropriate management*

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CAP Implementation

Property Owner Utilized $170,000 from EPA Revolving Loan Fund from Vermont Agency of Commerce and Community Development

Floor Drains: cleaned, sealed with concrete and waste material appropriately disposed

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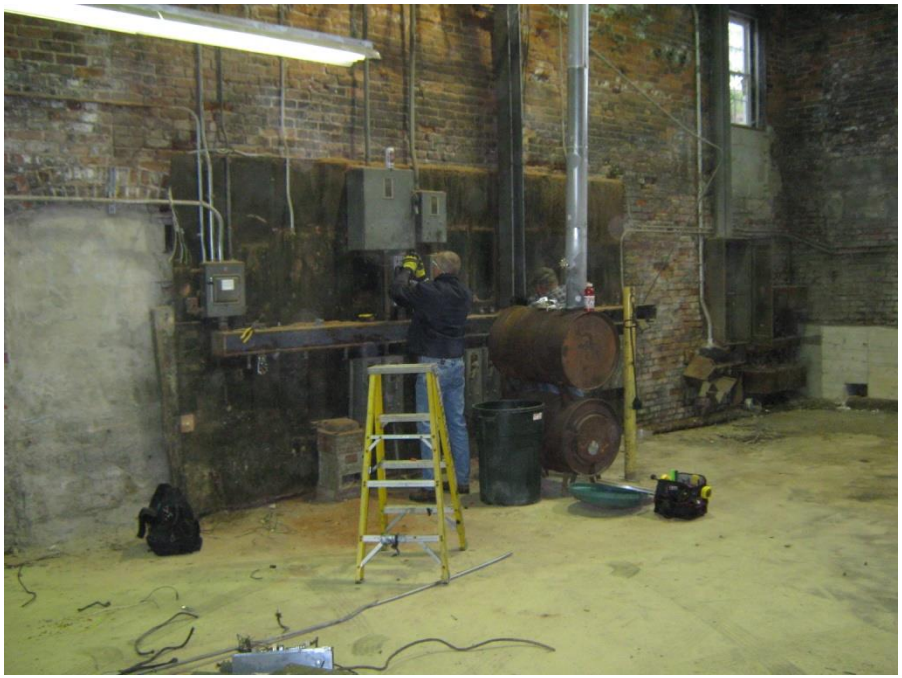
CAP Implementation



<u>Old Electric Equipment</u>:
Dismantle and appropriately dispose

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CAP Implementation

Interior Surfaces: Pulp scraped, all surfaces vacuumed and power-washed, waste generated was containerized, characterized and appropriately disposed of offsite.

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CAP Implementation

Epoxy paint all surfaces

Dual layer contrasting colors in PCB areas

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CAP Implementation - BEFORE

The Johnson Company

CAP Implementation - AFTER

The Johnson Company

Confirm Effectiveness of Clean-Up – Indoor Air Sampling for Dioxin/Furans and PCBs

- Tisch TE-1000 high volume samplers
- Polyurethane foam filter (PUF)
- Quartz fiber filter (QFF)

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Deed Restriction

The Deed Restriction is intended to address potential exposure associated with:

1) Known PAH impacted soils associated with the former 10,000-gallon capacity underground storage tank (UST);
2) Buried pipes that were formerly used to transport presumably pulp containing mill process wastewater (dioxins and PCBs) from the building to the lagoons in the northern parcel;
3) Loading dock area to receive impacted sediment from dam renovation and be capped with an engineered isolation barrier.

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Hydroelectric

- Two Ossberger Kaplan Hydraulic Turbines
  - Tailrace Channel Turbine is 215 kW
  - River Channel is 145 kW
- The plant will be an automatic, computer controlled, run of the river operation
- Will produce 1,454,000 kWH per year (125 homes per year)
- Will generate over $120,000 in retail electric cost per year
- Generated energy will offset 1.003 metric tons of CO_2 per year
  - CO_2 emissions from 197 passenger vehicles per year
  - CO_2 emissions from 13.2 tanker trucks worth of gasoline
  - CO_2 emissions from burning 5.5 railcars of coal
- Will create several full-time jobs.

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Future of Site

- Primary residence for the property owners
- Four condo units with river and covered bridge views
- Publicly accessible open space
- Canoe/boat launch area and river access

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