

Brownfield Development and Integrated Environmental Site Management



FCM Brownfields Knowledge Workshop
(Ottawa 2006)

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Municipal Tips For Brownfields

- community improvement plans and site selection priorities
- municipal brownfield coordinator and upfront incentives
- coordination with upper tier municipalities or region
- municipal brownfield guidelines/policies
 - planning considerations during project due diligence
 - conveyance of potentially impacted lands
 - off-site impacts/roadways/utility corridors
 - engineered controls/risk management
 - creating public awareness
 - ground water conservation and criteria selection
 - site closure

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Brownfield Assessment and Integrated Site Management

- Brownfield Site Identification
- Environmental Due Diligence and Quantifying Risk
- Integrated Brownfield Management Strategies



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Brownfield Site Characteristics



- Former industrial/commercial/residential site with established location and infrastructure
- Site value neutral or negative
- Various site usage with unclear site management practices
- Site restoration technically challenging and cost prohibitive

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Brownfield Characteristics



- Soil and/or groundwater impacted by former operations
- Remaining site infrastructure including wastes and hazardous materials
- Stigma and liability concerns
- Possible association with a Community Improvement Plan

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Roles and Responsibilities

Owner

- site is suitable for proposed use
- notification and management of possible adverse effects

Contractor/Constructor

- preparing and implementing site development strategy
- managing the site health and safety plan
- ensuring applicable permit/regulation requirements

Qualified Person

- developing environmental management strategies
- site monitoring and verifying site conditions
- documentation and site closure

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Applied Environmental Due Diligence

- Phase I Environmental Site Assessments (ESA's)
- Designated Substance Surveys
- Phase II ESA's
- Risk Assessment
- Site Remediation and/or Mitigation
- Site Management/Engineered Controls

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Phase I ESA Standard

CSA Z768-01 (Updated 2003)/ASTM E1527-97



Primary Objectives

- Historical Research (Ecolog - ERIS)
- Regulatory Request for Information
- Site Visit/Interviews
- Report Preparation

Limitations, does not include.....

- soil and groundwater sampling
- building materials sampling
- regulatory or code compliance issues

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Phase II ESA Standard CSA Z769-00 / ASTM E 1903

- Purpose of the Investigation - mandatory if change to a more sensitive land use
- Chemicals of Concerns - metals, hydrocarbons, and other inorganic and organic compounds
- Site Setting and Applicable Cleanup or Assessment Criteria Selection
- Sampling Methods - test pits, boreholes, monitoring wells
- Evaluating and Interpreting Analytical Results
- Discuss Findings and Possible Recommendations
- Site Closure

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Managing Soil and Groundwater Impacts

Site Remediation or Restoration

- Source Removal
- Bioremediation
- Phytoremediation
- Dual-Phase Extraction
- Chemical Oxidation
- Many Others In-situ and Ex-situ techniques

Site Specific Risk Assessment and Management

- Monitored Natural Attenuation
- Reactive barriers
- Encapsulation
- On-going Monitoring/Engineered Controls

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Advantages of Risk Assessment

- Addresses Wide Area Impacts On and Off-site
- Targeted Remedial Efforts Based on Proposed Use
- Improved Timing and Less Disruptive to Site Development Construction
- Preservation of Historic Buildings and Cultural Landmarks
- Encourages On-site Management versus Off-site Disposal
- Easily Integrated with Other Remedial Strategies
- Benefits Translate to Upfront Cost Savings for Re-development

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Maximizing Site Investments



- Community benefit and Removal of Stigma
- Multi-purpose or Mixed Use (residential, commercial and parkland)
- Appropriate restoration criteria and selection and integration of remedial actions
- Incremental approach to site restoration and integration with site redevelopment
- Smart and sustainable building design

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Brownfield Development Matrix

- Location and Financing
- Zoning - Master Plan - Proposed Land Use
- Site Development Options
- Municipal Approval and Documentation
- Ownership/Legal
- Partnership capabilities
- Stakeholder Acceptance
- Contaminant Concentrations and Characterization
- Available Remediation Technology
- Regulatory Compliance
- Site Access
- Time Frame and Cost
- Off-site Mitigation/Remediation

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Integrated Site Management



- Risk assessment and criteria selection
- Alignment of site development and remedial objectives
- Demolition and source removal
- On-site material segregation and management

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Integrated Site Management



- On-site treatment and re-use of materials
- Off-site treatment and/or disposal
- Protective barrier installation during site redevelopment
- Site monitoring and management

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Brownfield Opportunity-Former Metal Products Manufacturing Facility



- abandoned 40 acre inner city location
- area designated for community improvement and employment
- widespread metal and chlorinated solvent impacts
- remaining surface and below grade infrastructure
- off-site contaminant migration and residential receptors
- buried building debris

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Site Solution- Phased Commercial Development



- phased commercial site development and employment opportunities
- integrated generic and risk based remediation
- material recycling, source removal and treatment
- engineered barriers to address continued off-site migration
- building designed for LEED certification

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Brownfield Development Considerations

- Meeting All Stakeholder Requirements and Expectations
- Comprehensive Risk Analysis and Acceptable Financial Model
(30% of Brownfield sites have insurance protection, 8-12% of project costs)
- Engage the Peer Review Process
- Comprehensive Due Diligence Programs
- Follow Established Standards, Protocols and Procedures
- Anticipate Change and Need for Flexibility
- Establish Contingencies and Expect Delays

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"Urban Sprawl" Legislation and Policy

Greenbelt and Places to Grow Acts (2005)



- Protect green space and limit urban sprawl in Greater Golden Horseshoe
- Promote intensification and brownfield redevelopment

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Rural Municipal Challenges

- Lower Market Values
- Limited Development Options
- Potable Groundwater Protection
- Reluctant Owners
- Limited Local Expertise
- Abundant Greenfields

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Public and Private Partnership Opportunities

- Site selection and brownfield project coordination
- Significant up-front incentives
- Quantifying off-site risks and mitigation
- Assessment of perceived risk versus actual risk
- Stakeholder acceptance of site specific risk assessment
- Improved closure for regulatory liability
- Beneficial use of environmental regulations

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Kilmer Brownfield Equity Fund

A specialized Canadian private equity fund whose focus is the re-development of Brownfields

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