Redeveloping Brownfields in Saskatoon

A Guidebook

City of Saskatoon
Planning & Development Branch

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Redeveloping Brownfields in Saskatoon: A Guidebook was produced in partnership with the City of Saskatoon Planning & Development Branch, Neighbourhood Planning Section and the Environmental Services Branch. Photo(s) courtesy of the City of Saskatoon and Meewasin Valley Authority.

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Introduction

This guidebook provides valuable information for developers considering undertaking a brownfield redevelopment in Saskatoon. It covers general information about brownfields and some of the issues that prospective developers should be aware of.

What is a brownfield?

"A brownfield is an abandoned, vacant, derelict or underutilized commercial or industrial property where past actions have resulted in actual or perceived contamination and where there is an active potential for redevelopment." [1]

Brownfields can include sites previously used as gas stations, rail yards, dry cleaners, warehouses, and storage areas for toxic substances as well as riverbanks, waterfronts, and any other sites where there was a history of commercial or industrial activity. While often associated with environmental contamination, brownfields are not necessarily contaminated. Some brownfields may remain underdeveloped simply because of the stigma of previous industrial activity on the site.

Why redevelop brownfields?

Brownfield redevelopment can provide a unique business opportunity for developers and offer:

- access to prime real estate in strategic locations, providing an attractive return on investment;
- opportunities for unique developments not possible on typical greenfield sites;
- opportunities to appeal to potential tenants and owners through distinctiveness, proximity to amenities, or project location; and
- access to incentives to assist with costs of clean up and site redevelopment.

[1] National Round Table on the Environment and Economy, *Cleaning up the Past, Building the Future: A National Brownfield Redevelopment Strategy for Canada.* 2003.

Benefits of brownfield redevelopment

There are many benefits to redeveloping brownfields as part of building a more sustainable community. The chart below lists the economic, social, and environmental benefits of brownfield redevelopment.

Table 1: Brownfield Redevelopment Benefits

Economic Benefits	Social Benefits	Environmental Benefits
Increased tax revenue for municipality	Neighbourhood revitalization and the opportunity to enhance existing areas	Less pressure for greenfield development and urban expansion
Use of existing infrastructure	Improvements in the health, safety and security of neighbourhoods	Improvement in environmental quality by removal of contaminants
Increased employment opportunities	Opportunities for development (such as affordable housing) in core areas close to services	Lowered risk of contaminants migrating off site
Opportunities to develop strategically located properties	Redevelopment of historical buildings	Improvements in air quality by redeveloping in already-established areas thus reducing transportation needs and associated harmful emissions
Increased values of surrounding properties	Improvement in quality of life in the neighbourhood	Reduction of Saskatoon's ecological footprint by redeveloping brownfields versus greenfields
Reduced liability for property owner	More sustainable and livable communities	
Economic opportunities for developers		

Former service station on 11th Street, 1031 Avenue J South.

Brownfields Legislation

With the exception of federal lands, contaminated sites are under the jurisdiction of provincial governments. In Saskatchewan, the Ministry of Environment regulates contaminated sites through the *Environmental Management and Protection Act, 2002* and its associated regulations. This legislation applies the "polluter pay" principle, meaning that parties who contaminate a site will be held responsible. As responsible parties cannot always be determined, or may no longer be in existence, there may still be risks for the property owner of a contaminated site. The Ministry of Environment is undertaking a review of legislation relating to contaminated sites, but at the time of publication, there is no complete release from liability available for property owners even when cleanup of a contaminated site is undertaken.

The Ministry of Environment emphasizes an outcome-based approach to cleaning up contaminated lands. This allows for considerable flexibility in remediation options. The Ministry of Environment also supports managing contaminated sites through risk-based approaches in certain cases, which can be less costly than traditional remediation approaches.

River Landing Phase II.

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Brownfield Redevelopment Roles and Responsibilities

Table 2: Brownfield Redevelopment Roles and Responsibilities

Stakeholder	Roles and Responsibilities
City of Saskatoon	• Ensure appropriate development through zoning and planning approval process • Issue and approve building permits • Ensure compliance with National Building Code for all construction projects including adaptive reuse
Ministry of Environment	• Ensure compliance with *Environmental Management and Protection Act, 2002* and associated regulations • Review and approve remedial action plans
Developer	• Practice due diligence when purchasing a site to determine environmental risks and liabilities • Undertake environmental assessments and remediation as necessary • Protect worker health and safety during redevelopment process • Implement public relations programs to deal with stakeholder concerns as appropriate
Environmental Consultant	• Manage environmental assessment process as per developer's request • Provide qualified and competent support in the subject areas of contaminated sites, environmental remediation, and risk assessment

How do Sites Become Contaminated?

Sites can become contaminated due to leaks, spills, or migration of contamination from a neighbouring property. All industrial or commercial areas have some potential for site contamination. The following table lists some of the more common types of land uses associated with contaminated sites, and the types of contaminants that may be present.

Table 3: Land use and types of possible contaminants

Land use	Sources	Contaminants
Dry cleaning operations	Solvents	Chlorinated hydrocarbons (PERC)
Petroleum fuel storage (gas stations, fuel storage sites)	Gasoline, diesel	Hydrocarbons, BTEX, lead
Electrical generation	Transformer oils	PCBs
Electroplating	Heavy metals	Lead, chromium, cyanide
Coal burning (coal power plants, old rail yards)	Fly ash	Heavy metals, PAHs
Auto repair or parts	Oils, solvents, batteries	Lead, mercury, cadmium, hydrocarbons
Agricultural chemical storage	Fertilizers, pesticides	Nitrogen, organophosphates, organochlorides
Old landfills	Leachate	High BOD, heavy metals
Old buildings or warehouses	Plumbing, electrical, insulation	Lead, asbestos, mercury
Housing built prior to 1955*	Heating oil, coal ash	Hydrocarbons, heavy metals

*Prior to 1955, houses used heating oil or coal for home heating. In 1955 SaskEnergy began supplying a new natural gas connection to each home, reducing the need for heating oil or coal heating.

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Environmental Assessment and Remediation

Contaminated site management involves two phases of environmental investigation, followed by implementation of a remedial action plan, and confirmatory sampling and reporting. This phased approach narrows the scope of the investigation to certain areas of the site and targets potential contaminants. These screening techniques may limit the extent and number of detailed analyses required, potentially reducing costs. This process is described in the following pages and a process schematic (Figure 1) is included on page 10.

This section provides general information about the environmental assessment and remediation process. All steps of the process should be managed by a qualified environmental consultant. There should also be consultation as necessary with Ministry of Environment to ensure that all regulatory requirements are being met. Appendix C provides a listing of Saskatoon-based environmental consultants.

Environmental Investigation

A site is considered contaminated if environmental contaminants are present at concentrations exceeding regulatory limits for the appropriate land use. The regulatory limits are a national standard set by the Canadian Council of Ministers for the Environment (CCME). While not all brownfields are contaminated sites, a proper assessment is important. In most cases, a potentially contaminated site can be identified through a Phase I: Site Information Assessment. In other cases, identification may be based on regulatory investigations, spill incidents, investigation of off-site impacts, or internal audits. If a potential risk of contamination is indicated, further investigation will be required.

Phase I: Site Information Assessment

A Phase I assessment includes historical and current information about a site as well as a site inspection. Phase I assessments are routinely requested by lenders considering financing for commercial, industrial, or large scale residential projects. No environmental testing is carried

out at this stage. The objective of the Phase I assessment is to determine if there is reason to suspect that the site may be contaminated, and if so, to help provide information to develop a field-testing program. A Phase I report includes recommendations on whether a Phase II is necessary (contamination is suspected) or whether no further action is required (there is a sufficient degree of certainty that the site is not contaminated).

Phase II: Environmental Testing Program

A Phase II study looks at site conditions and the contamination present using field investigation techniques (soil and groundwater sampling). This determines whether remedial action is required, and if so, assists in preparing a remedial action plan for the site. The amount of testing and the duration of a Phase II assessment can vary widely depending on the size of the site and its characteristics and the types of contaminants present. If the plan is to undertake a risk assessment, or if the site is complex or heavily contaminated, additional field investigation and sampling will be required.

Remedial Action Planning

Following the Phase II investigation, it is necessary to outline a remedial action plan. This requires that Site-Specific Remediation Objectives, or remediation targets, be established for the site by applying environmental quality guidelines. Environmental quality guidelines are numerical limits used to evaluate contaminant levels measured at a site. These guidelines essentially determine if a site is considered contaminated or not, and whether further investigation or remedial action is required. Environmental quality guidelines vary for different types of land use. For example, residential or park land has more stringent environmental quality guidelines than a commercial or industrial site.

There are three approaches to developing Site-Specific Remediation Objectives. The most suitable approach is determined by taking into account special site characteristics as well as project budget, timeline, and approval from the Ministry of Environment.

Tier 1

A Tier 1 approach involves directly adopting the Environmental Quality Guidelines for use as Site-Specific Remediation Objectives. This is often the most stringent type of cleanup but may reduce the amount of environmental investigation required for a site. In this approach, Site-Specific Remediation Objectives do not take into consideration any site-specific factors and may mean removal and disposal of a large volume of soil. This approach may be appropriate when a site is heavily contaminated or must be remediated relatively quickly. A Tier 1 approach was used when the former A.L. Cole Power Plant (part of River Landing Phase II) was remediated to residential/park land standards.

Tier 2

A Tier 2 approach involves adopting the Environmental Quality Guidelines for use as Site-Specific Remediation Objectives with the additional consideration of site information to develop site-specific criteria for cleanup. The type of information considered may include presence of receptors (human or ecological), soil types, and likelihood of contamination travelling off site. There are two types of Tier 2s. A Tier 2(A) is the adoption of Site-Specific

Remediation Objectives comprised of adjustments to Tier 1 levels based on site-specific parameters such as soil type. A Tier 2(B) is the modification or elimination of exposure pathways/receptors usually achieved through administrative controls.[2]

Tier 3

A Tier 3 approach develops Site-Specific Remediation Objectives using a Risk Assessment, a scientific way of assessing a contaminated site for risks to human or ecological health. Risk Assessment involves an examination of the contaminants on site, the receptors (human or ecological), and exposure pathways. There are two types of Risk Assessments, Ecological Risk Assessments or Human Health Risk Assessment. The type of risk assessment required is dependent on site-specific conditions and would be decided by an environmental consultant with approval from the Ministry of Environment. The River Landing redevelopment project has successfully applied a risk-based approach to manage contamination close to the shoreline. Further information on this project is included on page 23.

Opting to establish Site-Specific Remediation Objectives using a Tier 2 or Tier 3 approach can mean reduced costs for remediation. Although an initial increase in the extent and costs of environmental investigation may be required, the remedial action plan may be more targeted and specific, thus reducing costs.

Options for Remedial Action

Once Site-Specific Remediation Objectives have been established, a remedial action plan needs to be developed. There are four broad options for the plan:

1. Complete cleanup
2. Partial cleanup of priority items
3. Establishment of a monitoring program
4. No action

For sites requiring a partial or complete cleanup, a remedial strategy will need to be designed using the appropriate remedial technology. Remedial technologies fall into the following categories:

1. Passive Remediation / Monitoring
2. Containment and Isolation
3. Removal for Treatment
4. In Situ Treatment

Environmental contamination can be dealt with through a variety of remedial approaches. The appropriate remedial technology for a site is determined by various factors including whether there is an appropriate proven technology available, cost, schedule, safety, as well as site-specific considerations. Table 4 provides an overview of some of the common remedial technologies and their applications.

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[2] Dahme, H., Gowling Lafleur Henderson LLP. *Cross Country Check Up Canadian Brownfields 2006: Development the New Real Estate Frontier.* October 26, 2006. Presentation.

Table 4: Summary of Remedial Technologies*

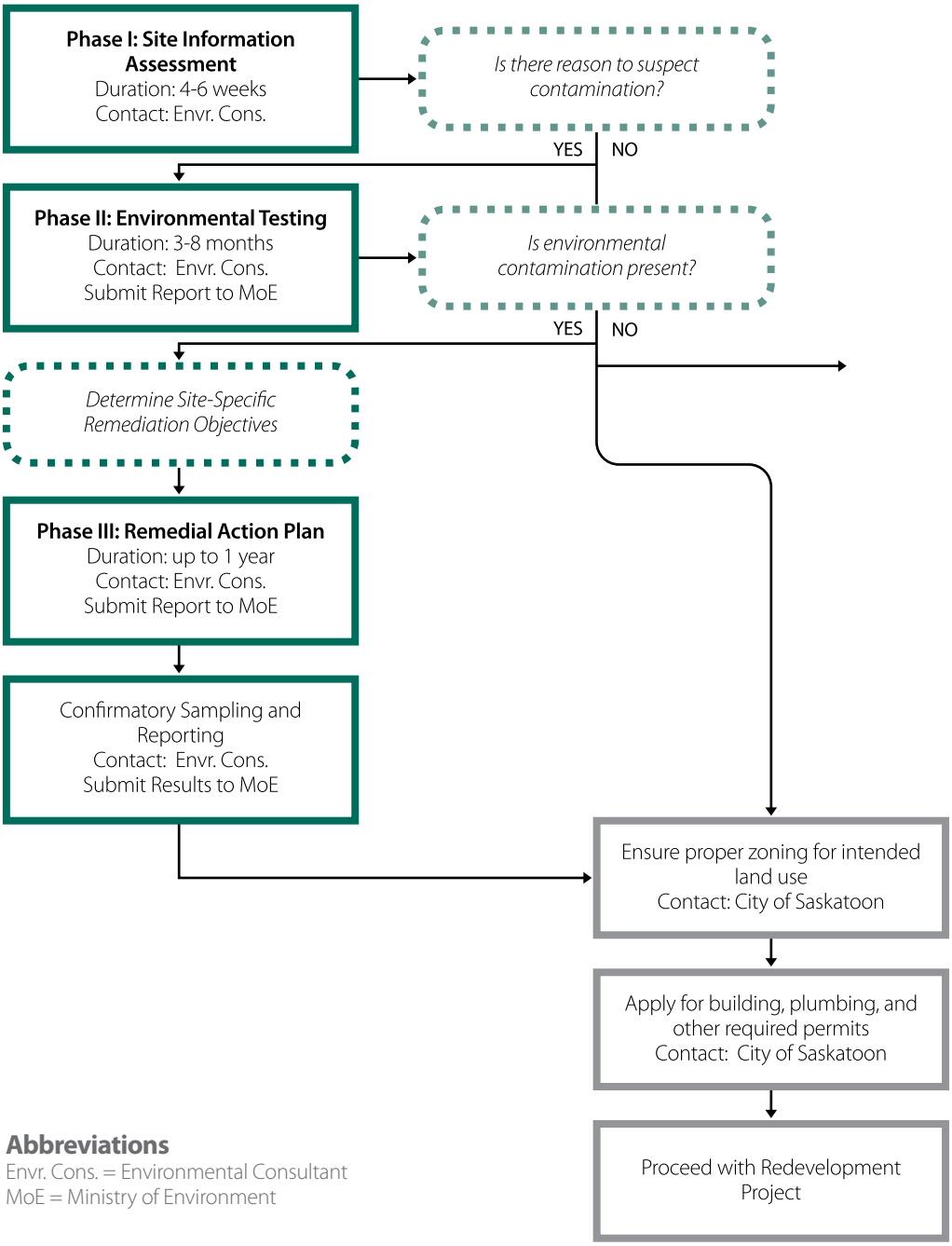
Technology	Basic Approach	Possible Applications
Passive Remediation / Monitoring	Monitor natural attenuation	Sites where likely impact is acceptable
Containment and Isolation	Isolate waste from the environment at risk	Capping landfills to prevent leaching by recharge waters
Physical	Prevent contaminant movement by limiting fluid flow	Landfill covers, slurry walls
Encapsulation	Create an inert waste form	Inject solidifying chemicals into waste
Vitrification	Apply electrical energy to vitrify contaminated material	Shallow metal-contaminated soils or waste
Removal for Treatment	Remove contaminants and treat on- or off-site	Groundwater, soil vapour pumping and soil excavation
Product Recovery	Pump NAPL	Always leaves a residual
Groundwater Extraction	Pump groundwaters for surface treatment	Most common approach for contaminated groundwaters
Soil Venting	Pump contaminated vapours	For volatile organics
Sparging	Inject gas bubbles to remove volatiles	For volatile organics
In Situ Soil Flushing	Add water to leach contaminants and collect this water	For soluble contaminants
Enhanced Solubilization	Add surfactants or solvents to solubilize contaminants for removal	Applied to sorbed contaminants or NAPL residuals
Excavation	Remove contaminated soils	Common practice for shallow, highly contaminated soils
***In Situ* Treatment**	Alter *in situ* conditions to create contaminant degradation	Common approach for volatile or biodegradable organics
Bioventing	As soil venting, above, but encourages biodegradation	Useful for aerobically degraded organics (e.g., gasoline)
Landfarming	Encourage natural degradation of wastes in surface soils or wastes spread on land	Currently used for aerobically degraded organics
In Situ Biodegradation	Alter groundwater environment to encourage biodegradation of dissolved or residual contaminants	Currently used for aerobically biodegraded organics (e.g., BTEX with oxygen and nutrients added to groundwater)
Reactive Barriers	Create conditions for contaminant attenuation in a permeable barrier	Groundwater flows through reactive barrier in which contaminants are sorbed or degraded

*Adapted from: Subsurface Assessment Handbook for Contaminated Sites, Canadian Council of Minister of the Environment, Report CCME EPC-NCSRP-48E, March 1994, The National Contaminated Sites Remediation Program.

Confirmation Sampling and Reporting

Sampling confirms the successful removal of contaminants once remedial activities are completed, and whether remediation targets for the site have been met. For some sites, particularly if contaminants are not removed but are treated in situ or if they are managed using containment or isolation techniques, long-term monitoring will be required.

Figure 1: The Environmental Assessment and Remediation Process for Redeveloping a Brownfield



Abbreviations
Envr. Cons. = Environmental Consultant
MoE = Ministry of Environment

Overcoming Challenges of Redeveloping Brownfields

There are compelling reasons to redevelop brownfields. However, brownfields also pose unique challenges for developers. These include:

- difficulty securing financing using traditional approaches;
- costs associated with environmental site assessment and remediation;
- liability concerns associated with ownership of a site;
- environmental assessment and remediation (when necessary); and
- public perception of the environmental health and safety of a site.

Overcoming these challenges is possible, as proven by a number of successful brownfield redevelopment projects in Saskatoon and elsewhere in Canada. This guidebook provides developers information on brownfield redevelopment that can help with overcoming the associated challenges.

Financing options for redeveloping brownfields

Lenders may hesitate to finance a brownfield redevelopment project if there are environmental risks associated with the property. While these concerns cannot always be eliminated, it is important to provide the potential lender with thorough and complete environmental information for the site. Thus informed, the lender will be better equipped to assess the values and risks of the project. Information that may assist lenders in evaluating risk includes:

- the types of contamination present and prior uses of the property;
- the results of any environmental investigation and whether there is any indication of off-site impacts;
- the choice of environmental consultant;
- whether the chosen remediation method is a proven technology and what other options are available if the first technology fails; and
- whether a risk assessment will be included and if there are requirements for ongoing monitoring.

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While brownfield redevelopment investment opportunities are not recognized by all financial institutions, it is significant to note the emergence of some private brownfield equity funds in Canada including both institutional and private investors. One of these funds is the Kilmer Brownfield Equity Fund L.P. which acquires and redevelops qualifying brownfield sites. This typically includes remediation of the site and rezoning to a higher land use classification prior to sale to a developer for completion of the redevelopment.[3] Another example is the CCI Development Group of Companies which focuses on the acquisition, remediation, and sustainable redevelopment of environmentally-impacted sites in Canada. They also offer liability protection to owners of brownfield sites through liability transfer and risk management.[4]

Assistance with costs of site assessment and remediation

Costs associated with environmental site assessment and remediation may not be known at the outset of a project and can be difficult to estimate. The City of Saskatoon has a temporary program (the Enterprise Zone) which offers incentives to assist developers with environmental screening and remediation costs. However, the City will examine the need to develop a new incentive program specifically for brownfield redevelopment in the near future. More information can be found online at **www.saskatoon.ca**.

The current incentives offered may provide a rebate of up to 100% of costs of Environmental Screening Charges for eligible projects. Screening charges are those incurred for a Phase I and Phase II site assessment. Remediation costs may also be eligible for a rebate, and are determined on a project-specific basis. In addition, as most brownfield redevelopment projects are located in core neighbourhoods or the Downtown, developers may qualify for additional incentives under the Downtown Housing Incentives Program and the Affordable Housing Incentives Program. Please see page 14 for more information on these programs.

Limiting liability exposure associated with brownfields

Brownfields can pose liability concerns, but there are ways to lower liability exposure. When purchasing a site, an environmental assessment (Phase I) should be undertaken by a qualified environmental consultant. This is usually required if attempting to secure financing; however, it is also an important part of due diligence by the purchaser as it can reveal environmental concerns with the property.

Another way by which exposure can be limited is through environmental insurance products. While more cost-effective for large projects, these can be used to cap cleanup fees, cover costs of remediation for unknown pre-existing contamination, or to protect against third party civil liability claims.

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[3] Kilmer Brownfield Equity Fund. *www.kilmergroup.com/brownfield/index.html* December 19, 2008.

[4] CCI Development Group of Companies. *www.cherokeecanada.com/index.html* December 19, 2008.

The environmental assessment and remediation process

A clear understanding of how the environmental assessment and remediation process works can help developers to identify site-management options that may reduce costs or shorten project duration. Refer to page 6 for more information on environmental assessment and remediation.

Improving public perception of brownfield redevelopment

Brownfield redevelopment is an important part of improving neighbourhoods; however, redevelopment projects may concern local residents or other stakeholders about the potential for exposure to contaminants from the site. It is important to be sensitive to these concerns especially in the case of projects located close to parks, schools, residences, or in locations that are highly visible. A public relations program should begin early to address concerns and communicate how risks are being managed and exposure to contaminants is being reduced (e.g. dust control, covering of excavated soil, etc). The public relations program should be appropriate to the scale of the project and the associated risks and may include having a contact person to answer questions, holding a public meeting, or issuing press releases. Negative perception of a project can be minimized by starting a public relations program before concerns arise and informing the public of the benefits of the redevelopment project. For strategies to ensure effective communication with the public see Table 5 below.

Table 5: Tips for Dealing Effectively with the Public

Involve the public as early as possible in the process
Listen
Be honest
Be open
Be flexible
Don't pretend to know the answer
Keep them informed
Avoid technical jargon
Ensure public meeting facilities are accessible to community members and in proximity to public transportation

Incentive Programs

The City of Saskatoon recognizes that developers are faced with unique challenges when redeveloping brownfield sites. As many of the brownfield sites in Saskatoon are in the Downtown or in core neighbourhoods, developers may be able to access financial incentives through the *Enterprise Zone*, the *Downtown Housing Incentives*, and the *Affordable Housing Initiatives*. In particular, the *Enterprise Zone* includes a rebate program offering up to 100% of the costs of environmental screening charges upon completion of an eligible project. The program will also consider rebates of remediation charges on a project-specific basis. Decisions on the amount of funding that is provided for screening and remediation is made by the *Enterprise Zone* Adjudication Committee and is based on the perceived value of the project, precedent from previous projects, and the level of funds available.

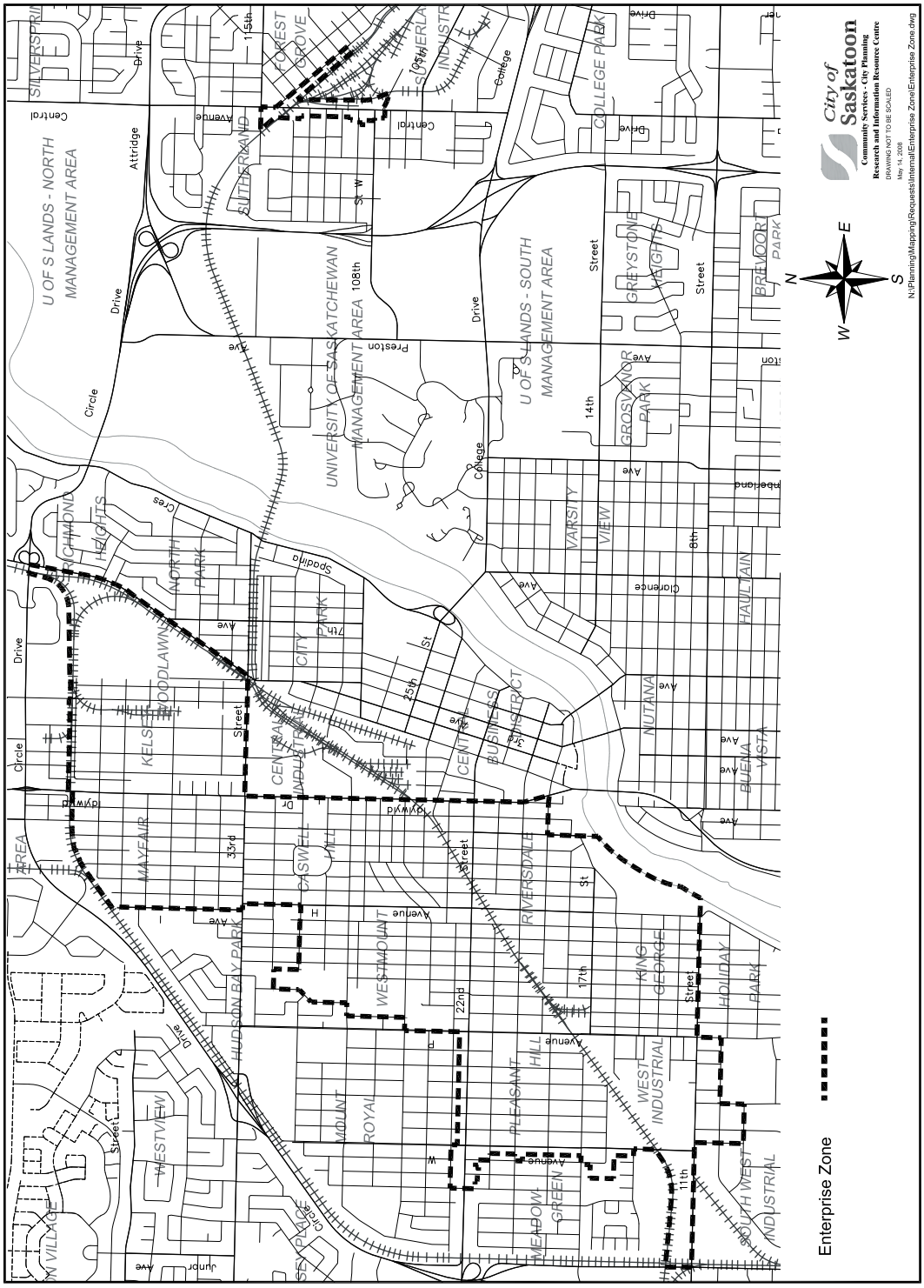
The Enterprise Zone

The *Enterprise Zone* is a temporary incentive program and consists of seven core neighbourhoods and inner-city industrial areas at risk of falling further behind the rest of the city in terms of income, job creation, economic opportunity, property value, and some essential commercial services. The program includes incentives offered to encourage property owners and developers to invest in the renovation, expansion, or creation of new housing, and to increase consumer and investor confidence in the Zone.

The program includes the neighbourhoods of Caswell Hill, King George, Mayfair/Kelsey, Pleasant Hill, Riversdale (but not River Landing), Sutherland Business Improvement District, West Industrial Area, and Westmount.

Please note: *the Enterprise Zone is a temporary incentive program available to assist with environmental screening and remediation. While there is no guarantee a new incentive will be developed, the City of Saskatoon will be examining the need to offer an incentive program specifically for brownfield redevelopment.*

Map 1: Saskatoon Municipal Enterprise Zone



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The following is a list of the incentives available for new construction, renovation, or expansion of properties within the zone:

Building and Plumbing Permit Fee Rebate - Any eligible use, including residential uses, will receive a rebate of the building and/or plumbing permit fee for renovation or new construction within the *Enterprise Zone*.

Property Tax Abatement - Any eligible use, with the exception of one or two-unit dwellings, can apply for a property tax abatement not to exceed five years. The abatement will apply to any increase in taxes as a result of development or significant improvements. One and two unit dwellings receive an automatic 36 month tax abatement if improvements lead to an increase in assessed value.

Development Charges - Any eligible use, with the exception of one or two-unit dwellings, can apply for a rebate of any or all off-site and direct development charges as calculated by the Infrastructure Services Department. Each application will be dealt with on a case-by-case basis.

Rebate Environmental Screening Charges - Environmental Screening Charges may be rebated up to 100% of costs upon completion of any eligible use including one and two-unit dwellings. Remediation charges may also be eligible for a rebate.

Façade Appearance Grant - Commercial owners may be eligible to apply for a grant (up to $2,500) for the purpose of enhancing or restoring the permanent features of any street facing building fronts.

The following incentives are available to accommodate specific commercial proposals or projects at a specific location:

Land Assembly - The City may create suitable sites for development by paying charges (including land costs) related to lane closures, infrastructure improvements, and other upgrades. The "assembled" site would be sold in a ready-to-build state. Land assembly is available to owners who wish to expand or build on adjacent city-owned land.

Official Community Plan Amendment Fees - The City will rebate full costs associated with amending the Official Community Plan, including advertising fees. The rebate is available upon formal approval of amendment by City Council.

Rezoning Fees - The City will rebate full costs associated with amending the City of Saskatoon Zoning Bylaw, including advertising fees. The rebate is available upon formal approval of amendment by City Council.

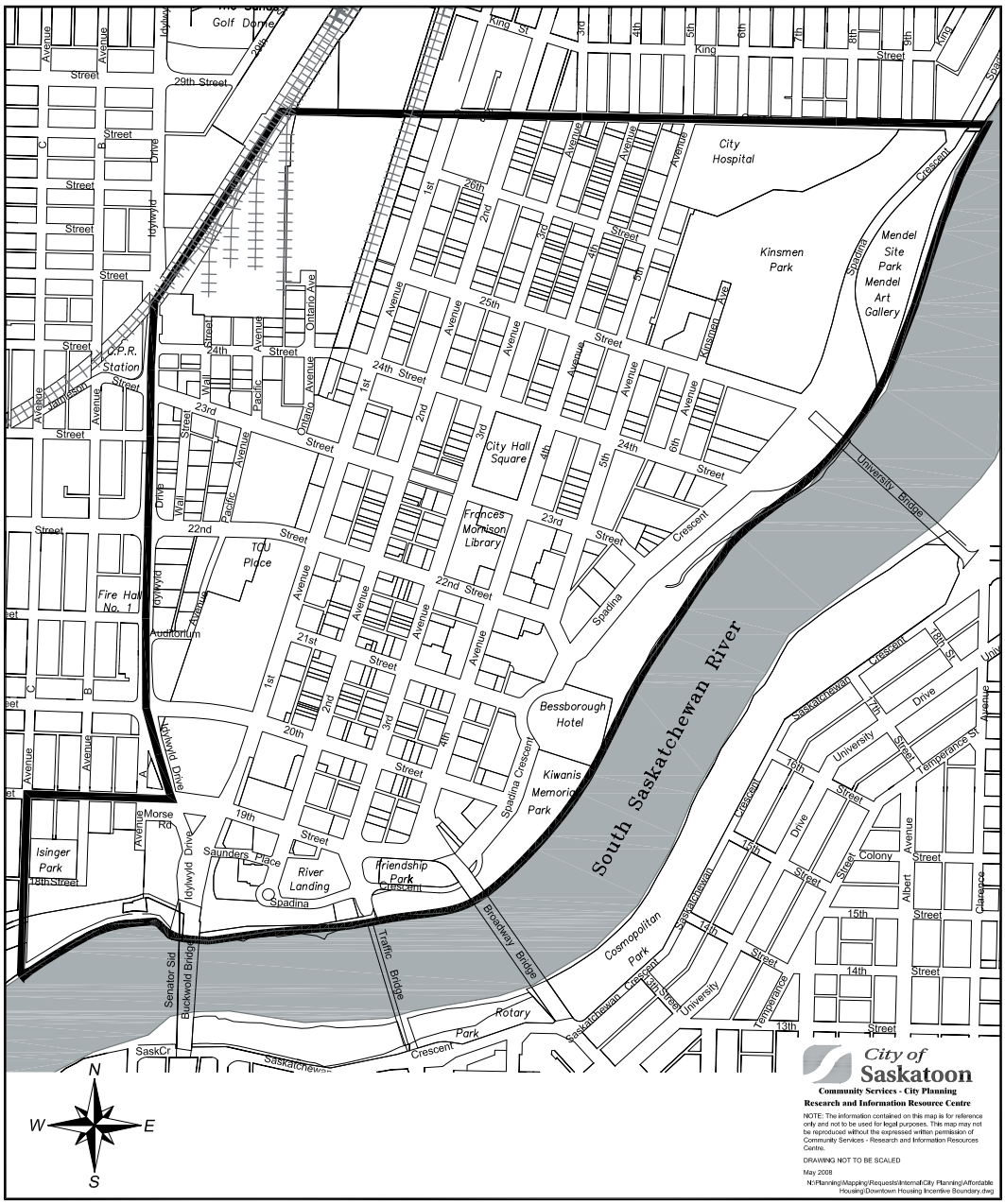
Discretionary Use Fees - The City will rebate full costs associated with Discretionary Use approval upon formal approval of Discretionary Use application by City Council.

Subdivision Fees - The City will rebate full costs associated with the Subdivision application, including approval fees. The rebate is available upon formal registration of the new sites at the Land Titles Office.

Downtown Housing Incentives

The *Downtown Housing Incentives* were established to facilitate increasing the population of Downtown to 10,000 people. The program is available in areas of the city north of the river up to Queen Street and west to Idylwyld Drive, including River Landing.

Map 2: Boundary of the Downtown Housing Incentives Policy



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The program offers incentives for three types of housing development in the Downtown:

1. New Construction Program
The City of Saskatoon offers two types of Tax Abatement for new construction. Unrestricted residency projects are open to anyone, irrespective of age, income, or other status. Restricted Residency housing developments are targeted to a specific market such as seniors or students.

2. Renovation Program
The Renovation Tax Abatement Program is designed to reduce taxes for those renovating existing housing projects.

3. Residential Conversion Program
The Downtown Residential Conversion Program is intended to encourage mixed uses by converting buildings that have outlived their original commercial or industrial use to multiple-unit residential dwellings. Similar to newly-constructed market housing, a tax abatement of the increase in property taxes is available to the owners of newly-converted housing units.

Affordable Housing Initiatives

In 2007, the City of Saskatoon set a target of 500 affordable dwelling units annually. Current programs available for developers include:

New Rental Construction Land-Cost Rebate Program - This program provides grants of $5,000 per eligible rental unit for new construction or additions to existing structures. Additionally, the City will provide five-year property tax abatement for eligible rental housing projects.

Capital Funding Assistance - A cash grant of 10% of total project costs is available for eligible affordable housing projects.

Property Tax Abatement - Affordable rental projects that are provided on a non-profit basis are eligible to receive a five-year abatement of the incremental increase in property taxes.

Direct Sale of City-owned Land for Affordable Housing Projects - A policy is in place to permit the direct sale of City-owned land to non-profit housing providers for affordable housing projects.

Priority Review of Approved Affordable Housing Projects - Permit applications for affordable housing projects benefit from a priority review process which means that the reviewing branches and departments review these applications first.

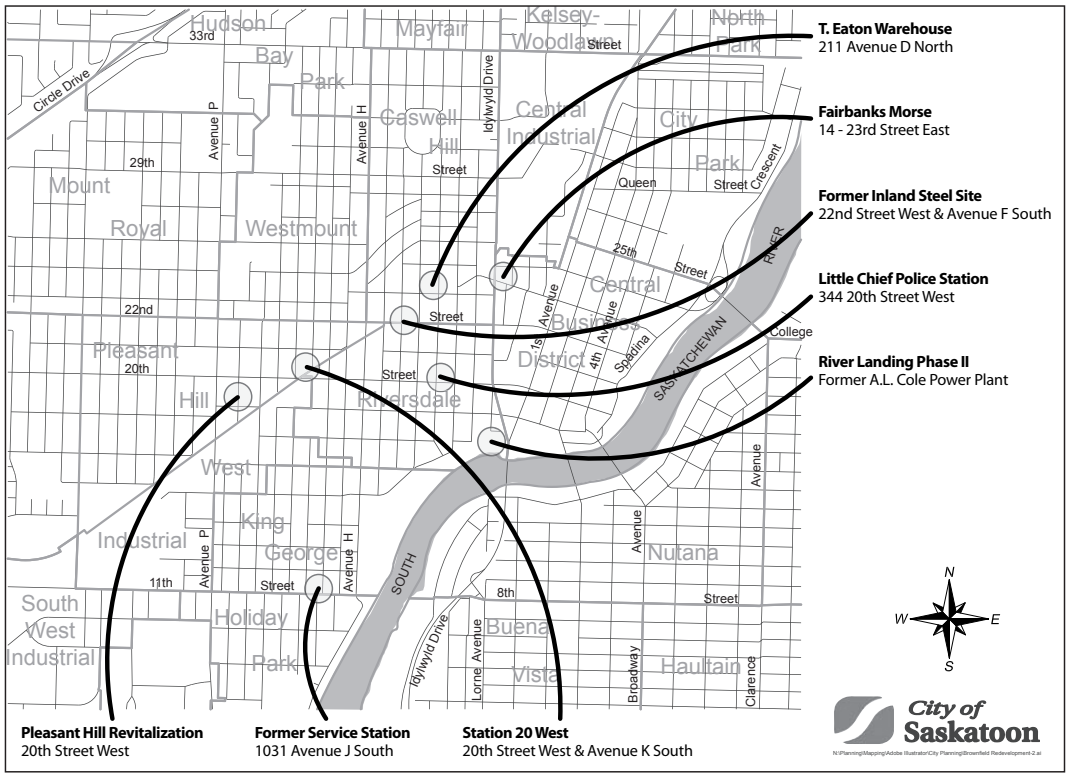
Waiver of Off-Site Levies - The collection of off-site levies has been cited as a deterrent to the redevelopment of older properties in the City of Saskatoon, many of which are suitable sites for affordable housing. In 2008, City Council approved a set of criteria for waiving off-site levies for specific affordable housing and neighbourhood revitalization projects in Saskatoon.

To find more information about these programs and how to apply please visit www.saskatoon.ca (look under "P" for Planning & Development in the alphabetical listing).

Brownfield Redevelopment in Saskatoon: Case Studies

The following case studies illustrate just a few of the many successful brownfield redevelopment projects that have been recently undertaken in Saskatoon. They also detail incentives provided by the City of Saskatoon to encourage brownfield redevelopment.

Map 3: Brownfield Redevelopment in Saskatoon - Case Studies



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Fairbanks Morse Building, 14-23rd Street East.

Fairbanks Morse Building (14- 23rd Street East)

The Fairbanks Morse building located on 23rd Street in downtown Saskatoon was redeveloped in 2006. The warehouse had been previously underused and was upgraded into loft condominiums. Environmental screening was required but did not identify a need for environmental remediation. In terms of incentives, the project proponent submitted a request for the City to consider providing additional assistance due to the higher level of risk associated with adaptive reuse projects. This resulted in the City amending the *Downtown Housing Incentives* to include a component directed specifically to adaptive reuse projects, including a rebate of taxes paid during construction for up to two years, a five year abatement of the incremental increase in residential taxes for unit owners, and a rebate of 75% of the offsite levies and direct service charges.

This project was also successful in the recycling of demolition material. By salvaging and reselling wooden beams that were removed, the developer was able to recoup all costs of the interior demolition.

Table 6: Incentives Provided to Fairbanks Morse Project

Incentive Program	Incentive Provided	Amount
Downtown Housing Incentive	Five year tax abatement upon completion (estimate of total foregone revenue)	$91,250
Downtown Housing Incentive	Rebate of taxes paid during construction	$22,041
Downtown Housing Incentive	Rebate of 75% of off-site levies and direct service charges	$30,090
Total		$143,381

Former service station on 11th Street, 1031 Avenue J South.

Former service station on 11th Street (1031 Avenue J South)

An abandoned lot that had previously been used as a service station was redeveloped into a two-unit dwelling . This attractive redevelopment project was carried out by a local contractor who recognized the reuse potential of this site. Hydrocarbon contamination on the site required environmental screening and remediation, the full costs of which were rebated through the *Enterprise Zone* Program. This project also received an automatic rebate of building and plumbing permit fees through the *Enterprise Zone*. The owner was pleased with the outcome of the project and has received positive feedback from neighbours.

Table 7: Incentives Provided to Project at 1031 Avenue J South

Incentive Program	Incentive Provided	Amount
The Enterprise Zone	Rebate Environmental Screening Charges	$31,679
Total		$31,679

T. Eaton Warehouse, 211 Avenue D North.

T. Eaton Warehouse (211 Avenue D North)

The T. Eaton Warehouse was vacant for many years in a former industrial area before redevelopment by MFD Warehouse Restoration turned the building into high-end loft condominiums. Environmental remediation was not required although environmental screening and air quality testing was required. The project received rebates under the *Enterprise Zone*. The project proponents also received approval to a request for a rebate of property taxes paid during a two year construction period, similar to incentives available for the Downtown.

Table 8: Incentives Provided for T. Eaton Warehouse Project

Incentive Program	Incentive Provided	Amount
The Enterprise Zone	Five year tax abatement upon completion (estimate of total foregone revenue)	$460,000
The Enterprise Zone	Rebate Environmental Screening Charges	$9,883
The Enterprise Zone	Rebate of Development Charges	$58,644
The Enterprise Zone	Rebate of taxes paid during construction	$17,361
Total		$545,888

River Landing Phase II: before (left). **River Landing Phase II - during** (right).

River Landing

River Landing is Saskatoon's largest brownfield redevelopment project to date. It includes redevelopment of the west riverfront both north and south of the Idylwyld Bridge. The project is highly visible and is a major component in the revitalization of Saskatoon's south downtown. The River Landing project, once completed, will represent redevelopment of the most significant undeveloped real estate opportunity in Saskatchewan.

River Landing Phase II includes the site of the former A.L. Cole Power Plant. This site was known to have environmental contamination as soils had been impacted through the presence of fly ash from burning coal. The power plant had been previously demolished and the site remediated to commercial/industrial standards. However, to facilitate residential and public use of the site, the City of Saskatoon engaged a contractor to supervise remediation of the site to residential standards by removing impacted soil. Further pockets of contamination were identified during construction of new streets resulting in additional testing and remediation which increased costs.

Contamination close to the shoreline is being contained through a risk-based approach based on the results of environmental screening, human health risk assessment, ecological risk assessment, and an aquatic resource review.

Former Inland Steel Site, 22nd Street West & Avenue F South.

Former Inland Steel Site (22nd Street West & Avenue F South)

Previously owned by Inland Steel, the former brownfield located south of 22nd Street between Avenue F and the rail tracks was successfully remediated and redeveloped. The City, in conjunction with the province through the Orphaned Fuel Storage and Sales Facility Cleanup Program, undertook site assessment and remediation to commercial/industrial standards in 2003. The presence of heavy metals, hydrocarbons, and other contaminants required the removal of soil. Remediation increased redevelopment prospects for the site and allowed for sale to a developer who installed a discount variety store with a dry goods grocery store and restaurant/coffee shop. Residents of this core neighbourhood have benefited from the removal of an abandoned and contaminated site and from increased access to groceries and other household items.

Little Chief Police Station, 344 - 20th Street West.

Little Chief Police Station (344 - 20th Street West)

The Little Chief Police Station stands on a previous brownfield property, and was an adaptive reuse project. The site was used as a gas station from 1929 to 1980 and as a result was contaminated with hydrocarbons. The City of Saskatoon became owner of the brownfield site in 2001 following tax enforcement proceedings. The City undertook environmental remediation at a cost of approximately $30,000. The site was successfully remediated and redeveloped to house a community policing station established in 2002, and more recently the offices of the Riversdale Business Improvement District.

Remediation activity being undertaken on a site in the **Pleasant Hill Revitalization Project** (left). **Pleasant Hill Revitalization** (right).

Pleasant Hill Revitalization

The Pleasant Hill Revitalization Project is the largest neighbourhood renewal project in Saskatchewan encompassing the redevelopment of deteriorated single family homes, a new elementary school, and additional park space in the heart of Pleasant Hill. The project has included public consultation and visioning workshops with community members and other stakeholders. Environmental remediation was not anticipated as part of this project; however, hydrocarbon contamination was found on sites where coal and heating oil were used prior to the installation of natural gas. Furthermore, the presence of dry cleaning fluid, or PERC, was discovered in the park from a formerly adjacent dry cleaning operation which operated fifty years ago. The Pleasant Hill Revitalization Project is expected to cost over $200,000 in unexpected screening and remediation costs relating mostly to: site testing, analysis, remediation, site security, and fencing.

Station 20 West.

Station 20 West

Station 20 West is comprised of two sites located on 20th Street and Avenue K South (219 Avenue K South and 230 Avenue L South). 219 Avenue K South is a former commercial site and 230 Avenue L South is a former industrial site. Station 20 West is a brownfield redevelopment project which, once completed, will offer a number of Saskatoon's core

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neighbourhoods a vibrant community enterprise centre with residential and commercial development.

The industrial development at 219 Avenue K South began in the early 1900s. The former occupants included a Mohawk Gas Station at the southwest corner of the site, a Revelstoke lumber yard, and a railway spur passing through the site. The City of Saskatoon acquired the industrial site through tax enforcement, and in 2006, purchased the adjacent commercial site. To accommodate redevelopment, all buildings and structures at the site were demolished. Underground Storage Tanks, pump islands, and associated underground piping were reportedly removed from the former Mohawk Gas Station in the late 1990s or early 2000s.

There was known environmental contamination on both sites as soils had been impacted through the activities undergone by the former occupants. Once the City took ownership of the sites, environmental remediation occurred at a cost of approximately $480,000. Once all existing buildings and structures were demolished, remediation activities included exaction and off-site disposal of petroleum hydrocarbon (i.e., gasoline) and inorganic parameters (i.e., metals) impacted soils, the installation of liners, and backfilling. The City entered into an Urban Development Agreement with the Provincial and Federal Government to cost-share the land acquisition and environmental screening and cleanup.

The former industrial site at 219 Avenue K South was successfully remediated to a residential standard, sold to the Saskatchewan Housing Corporation, and has seen completed construction of a 55-unit affordable housing project with library and office space.

The site at 230 Avenue L South was remediated to a commercial standard and has been sold to Station 20 West Development Inc. for a new "Community Enterprise Centre," which will house offices, community space, and a new food store.

Table 9: Incentives Provided for Station 20 West

Incentive Program	Incentive Provided	Amount
The Enterprise Zone	Five year tax abatement upon completion (estimate of total foregone revenue)	$324,240
Affordable Housing Initiatives	Capital Funding Assistance (10% of total project cost)	$1,271,778
Total		$1,596,018

Appendices

A. Glossary

Brownfield
An abandoned, vacant, derelict, or underutilized commercial or industrial property where past actions have resulted in actual or perceived contamination and where there is an active potential for redevelopment.[5]

Contaminant
Any physical, chemical, biological, or radiological substance in air, soil, or water that has an adverse effect.[6] Common contaminants found in industrial or commercial areas include:

Asbestos – a naturally occurring fibre that is resistant to heat and most chemicals. Because of these properties it has been used in building materials including piping and insulation. It is a particulate and is carcinogenic to humans. (Source: aboutRemediation.com)

Dioxins – a group of hundreds of chemicals that are highly persistent in the environment. Dioxin is produced as a by-product of industrial processes including waste incineration, pulp and paper bleaching, and chemical manufacturing. Dioxins can cause cancer and also result in damage to the immune system and interference with hormonal systems. (Source: aboutRemediation.com)

Heavy Metals – heavy metals including lead, chromium, cadmium, and mercury can be introduced into the environment through emissions from coal combustion, mining, battery recycling, electroplating, and other industrial processes. The toxicity and health effects varies; but may include damage to the nervous system, cancer, and damage to the kidneys. (Source: aboutRemediation.com)

Hydrocarbons – a large class of organic compounds containing only carbon and hydrogen. Hydrocarbons are used as fuels, lubricants, and as raw material for manufacturing plastic. Includes gasoline, diesel, natural gas, and other types of fuel oils. (Source: www.answers.com)

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[5] National Round Table on the Environment and Economy, *Cleaning up the Past, Building the Future: A National Brownfield Redevelopment Strategy for Canada.* 2003.

[6] Canadian Council of Ministers of the Environment, *Subsurface Assessment Handbook for Contaminated Sites.* March 1994.

BTEX – an acronym referring to four common volatile hydrocarbon contaminants: benzene, toluene, ethylbenzene, and xylene that are found in gasoline and diesel. (Source: aboutRemediation.com)

Pesticides/Herbicides – a group of chemicals including organophosphates and organochlorides used to inhibit plant growth. Effects on humans and other animals are varied and can be severe. (Source: aboutRemediation.com)

PCBs – Polychlorinated biphenyls (PCBs) are good insulators and have been used as lubricants in transformers, capacitors, and other electrical equipment. PCBs do not break down easily and are very persistent in the environment. (Source: aboutRemediation.com)

PAHs – Polycyclic Aromatic Hydrocarbons (PAHs) are a large group of organic compounds mainly released during incomplete combustion of organic matter. The most common industrial source is coal ash. PAHs are carcinogenic. (Source: aboutRemediation.com)

Solvents – Solvents include chlorinated hydrocarbons and are used in a wide variety of applications including dry cleaning and as a degreaser. Some solvents such as tetrachloroethylene (often referred to as PERC or PCE) commonly used in dry cleaning have been identified as suspected carcinogens. (Source: www.en.wikipedia.org)

Contaminated site
A site where environmental contamination is present and poses, or is likely to pose, risks to human health or the environment.

Greenfield
A vacant property that has never been developed and has no actual or perceived contamination, usually located outside urban centres and without municipal services.[7]

Remediation
The action taken to clean up, contain, or remove the risk posed by contamination at a site.[8]

Risk Assessment
The process of identifying and evaluating risk to human health, human safety, and/or the environment from the actual or potential presence and/or use of specific pollutants.[9]

Site Assessment
An approach for identifying and assessing the potential environmental impact of activities conducted at a facility and/or the potential presence of contamination at a site in accordance with accepted standards.[10]

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[7] National Round Table on the Environment and Economy, *Cleaning up the Past, Building the Future: A National Brownfield Redevelopment Strategy for Canada.* 2003.

[8] Ibid.

[9] Ibid.

[10] Ibid.

B. Other Brownfield Redevelopment Resources

Brownfield redevelopment opportunities are increasing in cities across Canada and there are many resources available for further information. The websites of the following organizations provide a useful starting point for anyone redeveloping or considering redevelopment of a brownfield.

aboutREMEDIATION
An information resource on site remediation and brownfield redevelopment.
www.aboutremediation.com

Canadian Brownfields Network
A national advocacy network that represents the interests of brownfield practitioners and stakeholders who want to effect change and address the barriers associated with brownfield redevelopment in Canada. www.canadianbrownfieldsnetwork.ca

Ontario Ministry of Municipal Affairs, Brownfields Ontario
The Ministry leads government action on brownfields in Ontario. While some information on this site is Ontario specific, there is also general information that may be useful to brownfield developers elsewhere. www.ontario.ca/brownfields

National Round Table on Environment and Economy (NRTEE)
The NRTEE works to enhance the understanding and adoption of sustainable ways of life by developing and promoting viable policy recommendations for all sectors of society and for all regions of Canada. In 2001, the National Round Table launched an initiative aimed at promoting the transformation of Canada's brownfields into vibrant centres of community life. www.nrtee-trnee.ca/eng/issues/programs/brownfields/brownfields.php

Canadian Council of Ministers of the Environment
The website provides a listing of publications on the management of contaminated sites in Canada. www.ccme.ca/ourwork/soil.html?category_id=68

Ministry of Environment
Provides information on Saskatchewan environmental legislation and ministry contacts.
www.environment.gov.sk.ca

C. List of Saskatoon-based Environmental Consultants*

AMEC Earth and Environmental
3017 Faithfull Avenue
Saskatoon, SK S7K 8B3
(306) 975-0444

Aqua Terre Solutions Inc
200 - 333 25th Street East
Saskatoon, SK S7K 0L4
(306) 244-8663

Bullee Consulting Ltd
3550 Taylor Street East
Saskatoon, SK S7H 5H0
(306) 477-2822

Canada North Environmental Services
4 - 130 Robin Crescent
Saskatoon, SK S7L 6M7
(306) 652-4432

Clifton Associates
4 - 1925 1st Avenue North
Saskatoon, SK S7K 6W1
(306) 975-0401

Dagaz Environmental Inc
4 - 2510 Jasper Avenue
Saskatoon, SK S7J 2K2
(306) 249-1312

Envirotec Services Incorporated
804 46th Street East
Saskatoon, SK S7K 3V7
(306) 244-9500

Golder Associates
1721 8th Street East
Saskatoon, SK S7H 0A1
(306) 665-7989 fax

MDH Engineered Solutions
232 - 111 Research Drive
Saskatoon, SK S7N 3R2
(306) 934-7527

Northern Enviro Search Ltd
104 - 108 Research Drive
Saskatoon, SK S7N 3R3
(306) 373-1110

P. Machibroda Engineering Ltd
806 48th Street East
Saskatoon, SK S7K 5W2
(306) 665-8444

PHH ARC Environmental Ltd
210 Cardinal Crescent
Saskatoon, SK S7L 6H8
(306) 244-8799

Pinter & Associates Ltd
4 - 320 Jessop Avenue
Saskatoon, SK S7N 1Y6
(306) 244-1710

SLR Consulting Ltd
1141 8th Street East
Saskatoon, SK S7H 0S3
(306) 374-6800

Stantec
25 24th Street East
Saskatoon, SK S7K 0K3
(306) 667-2400

Wardrop Engineering Inc
1400 - 410 22nd Street East
Saskatoon, SK S7K 5T6
(306) 244-4888

WorleyParsons Komex
202 - 135 21st Street East
Saskatoon, SK S7K 0B4
(306) 664-3900

*Note: The City of Saskatoon does not endorse any of the aforementioned firms. They are listed only as a starting point for the convenience of the reader.

Notes

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