



**Environmental Impact Assessment
of Brady Road Landfill and Future
Resources Management Facility**

Prepared for:

*The City of Winnipeg
Water and Waste Department*

Prepared by:

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**ENVIRONMENTAL IMPACT ASSESSMENT OF BRADY ROAD LANDFILL AND FUTURE
RESOURCES MANAGEMENT FACILITY**

December 22, 2011

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1.0 Executive Summary

1.1 INTRODUCTION

1.1.1 Development Components to be Licensed

For purposes of applying *The Environment Act*, the “Development” within the meaning of the *Classes of Development Regulation* (Manitoba Regulation [MR] 164/88) is:

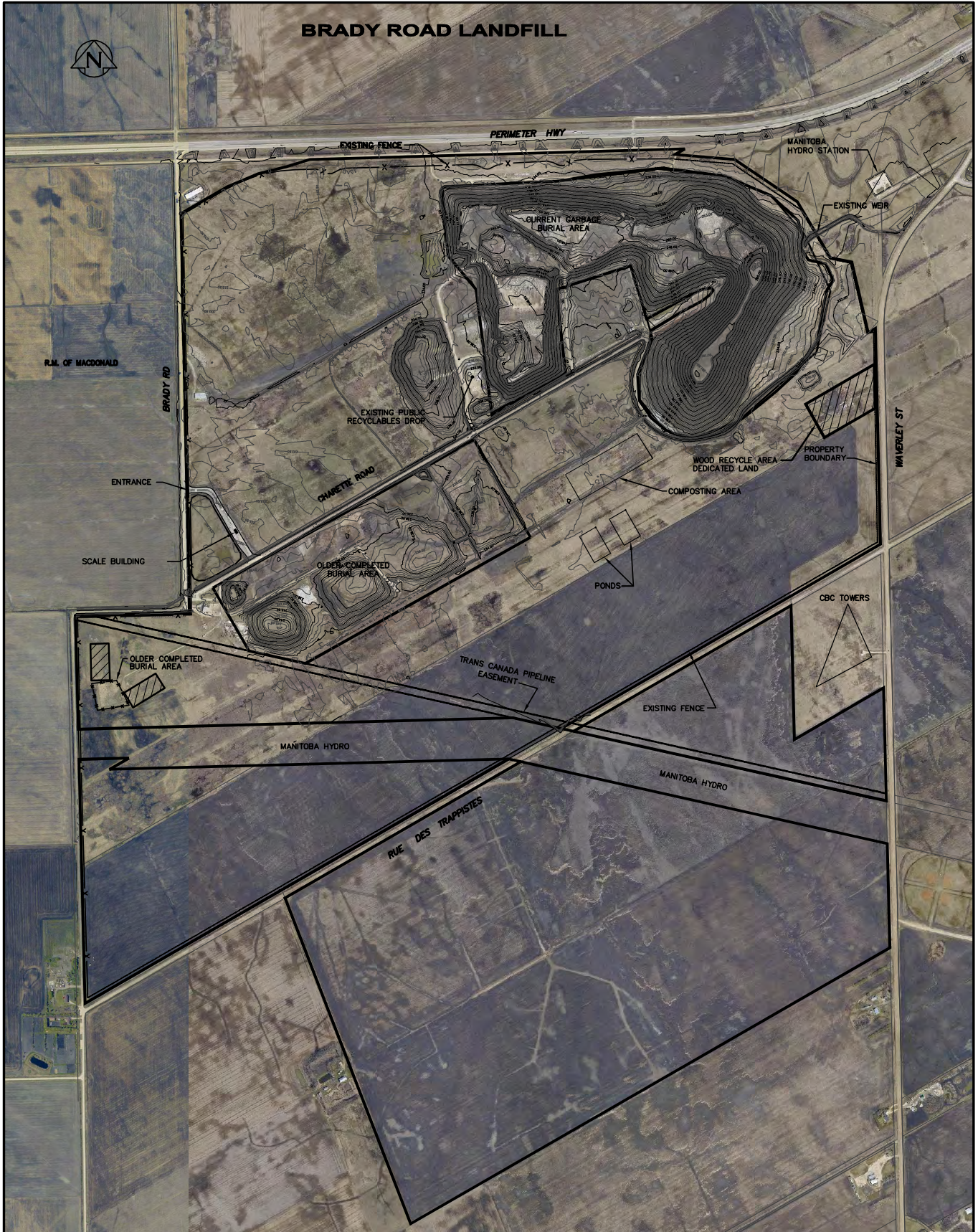
- The landfill operations and related site management of the Brady Road Landfill, east of Brady Road, south of the Perimeter Highway and west of Waverley Street (Figure 1-1).
- The future Brady Road Landfill as its site layout, operations and cell developments evolve in response to City Council’s endorsement of a Comprehensive Integrated Waste Management Plan (CIWMP, “The Garbage and Recycling Master Plan”) on October 19, 2011 (Figure 1-2).
- Ongoing environmental monitoring.
- Periodic research and development, usually involving support for landfill-related topics of interest to engineers and scientists undertaking graduate studies.
- The Division’s commitment to ongoing public disclosure and accountability.

The landfill operates pursuant to Waste Disposal Ground Operating Permit No. 1-015 issued October 13, 1993 (Appendix A).

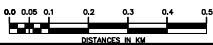
The evolution of the Brady Road Landfill over the next decades is expected to be substantial, as CIWMP implementation causes reduced deliveries to the site. Further, effects of the CIWMP include a significant increase in the upstream diversion of recyclable materials which currently are being buried in the landfill. Organic wastes will be a particular target of upstream diversion in the next half-decade. Materials now being landfilled which give rise to malodorous conditions (e.g., organic yard waste, kitchen waste, sulfide-containing wallboard, wood, etc.) will be increasingly diverted from burial. As the CIWMP is implemented, the “Development” will include on-site provision for enhanced materials recovery, organics recovery or composting, on-site materials reprocessing and commoditization, and opportunities for development of related businesses.


The intended future new activities at the site will be protected by an alteration of the zoning applicable to the City’s properties, which amendment is planned by the City to occur in 2012.

BRADY ROAD LANDFILL



THIS DRAWING CONTAINS A 2009 AERIAL PHOTO



 THE CITY OF WINNIPEG WATER AND WASTE DEPARTMENT	
BRADY ROAD LANDFILL	
CURRENT SITE PLAN	
SHEET 1 OF 1 CITY DRAWING NUMBER Figure 1-1	

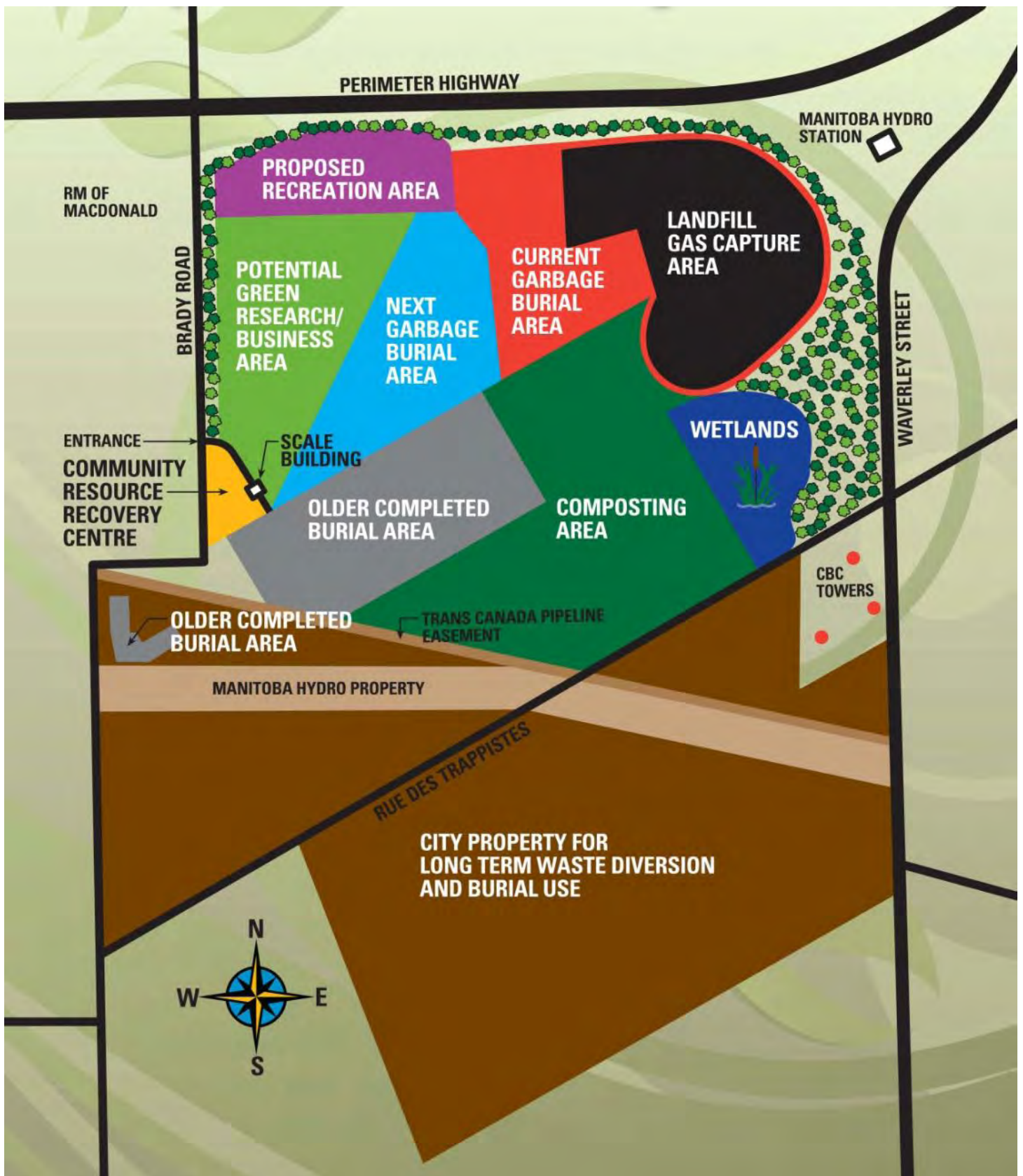


Figure 1-2
Brady Road Resources Recovery Facility

1.1.2 Previously Licensed Collateral Development

This development includes, but the licensing decision now being sought excludes, the design, construction and operation of a landfill-gas (LFG) recovery project. The LFG project has previously been reviewed by Manitoba Conservation, which issued *Environment Act* licence No. 2890 on July 22, 2009 (revised as Licence No. 2890R on September 8, 2010), to regulate its operations.

1.2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

1.2.1 Property Ownership

Appendix B provides hard-copy legal descriptions of all of the parcels of land owned by the City which comprise the Brady Road Landfill site. Included in Appendix B is a graphic illustrating the spatial distribution of these land parcels (City Plan No. 10998/1). The City, with the exception of easements described on a number of the Records of Title, is the owner of the land. As otherwise indicated in various Records of Title in the attached, the City is the owner of the mineral rights associated with each individual parcel.

1.2.2 Land Uses and Designations

Adjoining land uses include residential to the northwest, north and northeast, and agricultural to the east, south and west, with the exception of CBC broadcasting towers on one parcel to the west of Waverley Street (Figure 1-1).

Planned changes in land use on this site, as contained in the Garbage and Recycling Master Plan adopted by the City of Winnipeg Council on October 19, 2011 (Council approval attached as Appendix C) include the following:

- Expanding diversion and recycling operations.
- Providing for a Source-Separated Organics (SSO) Processing Facility.
- Expanding the size and types of composting operations, including:
 - The possible construction and operation of a new on-site Materials Recovery Facility (MRF).
 - Areas for segregating and managing Construction and Demolition (C&D), and Industrial, Commercial and Institutional (IC&I) wastes.
- Creating research and resource-recovery-related business facilities.
- Allocating green space as public-recreation areas.

The land use on the parcels of land described in Appendix B is currently for the burial and long-term management of a wide diversity of domestic, commercial and industrial solid waste. The evolution of the site during implementation of the CIWMP will include a reduction in the quantities and types of materials now being landfilled that are capable of recycling, repurposing and commoditization. Thus, portions of the site will be allocated to such activities (land uses) as materials separation, storage, reprocessing and shipment.

The land-use designations for the site and adjoining lands are set out below:

- The Brady Road Landfill is designated as a “Rural and Agricultural Area” in “Complete Communities, an ‘Our Winnipeg’ Direction Strategy” (Figure 1-3). The lands are zoned “A” Agricultural, in the City of Winnipeg Zoning Bylaw 200/06, which allows landfills as a conditional use. The landfill will be rezoned with a Plan Development Overlay to more appropriately reflect the imminent and future land uses of this site.
- Lands south and east of the landfill are designated “Rural and Agricultural Land” and zoned Agricultural, except for the lands designated Recent Communities southeast of the Waverley/PTH 100 intersection, as shown on the “Urban Structure in Complete Communities” (Figure 1-4). These Recent Communities lands are zoned “R1-M” Residential-Single Family. The area east of Waverley, north of Rue de Trappistes is designated as a New Community and is currently zoned “A” Agricultural.
- Lands northeast of the Waverley/PTH 100 intersection are designated “Recent Communities” and zoned “RR5” Rural Residential and “R1-M” Residential-Single Family.
- The lands northwest of the Waverley/PTH 100 intersection are designated “Recent Communities” and zoned as an “R1-M” Residential-Single Family (Medium) District, an “RMF-S” Residential Multi-Family (Small) District, an “RMF-M” Residential Multi-Family (Medium) District, a “PR1” Parks and Recreation 1 (Neighbourhood) District, a “C2” Commercial Community District, and a “C3” Commercial Corridor District, respectively (Bylaw No. 82/200 amended 137/2009). A significant portion of lands northwest of Waverley and PTH 100 are zoned “A” Agricultural, but are part of the Waverley West development. They will be developed in future phases as a mix of residential, commercial and employment uses.
- Lands to the west of the landfill are in the RM of Macdonald. Lands are zoned Agricultural General Zone in Bylaw 15/95. In the Macdonald/Ritchot Planning District Development Plan, the lands are designated Rural “Green Zone.”

1.2.3 Current and Proposed Developments

1.2.3.1 Current Activities

The Brady Road Landfill (Photo 1-1) now receives approximately 400,000 tonnes of domestic and commercial waste each year, largely from the City of Winnipeg. A small amount of waste is also received from provincial parks. Some commercial and industrial wastes from the City are

Figure 1-3

RURAL AND AGRICULTURAL AREAS

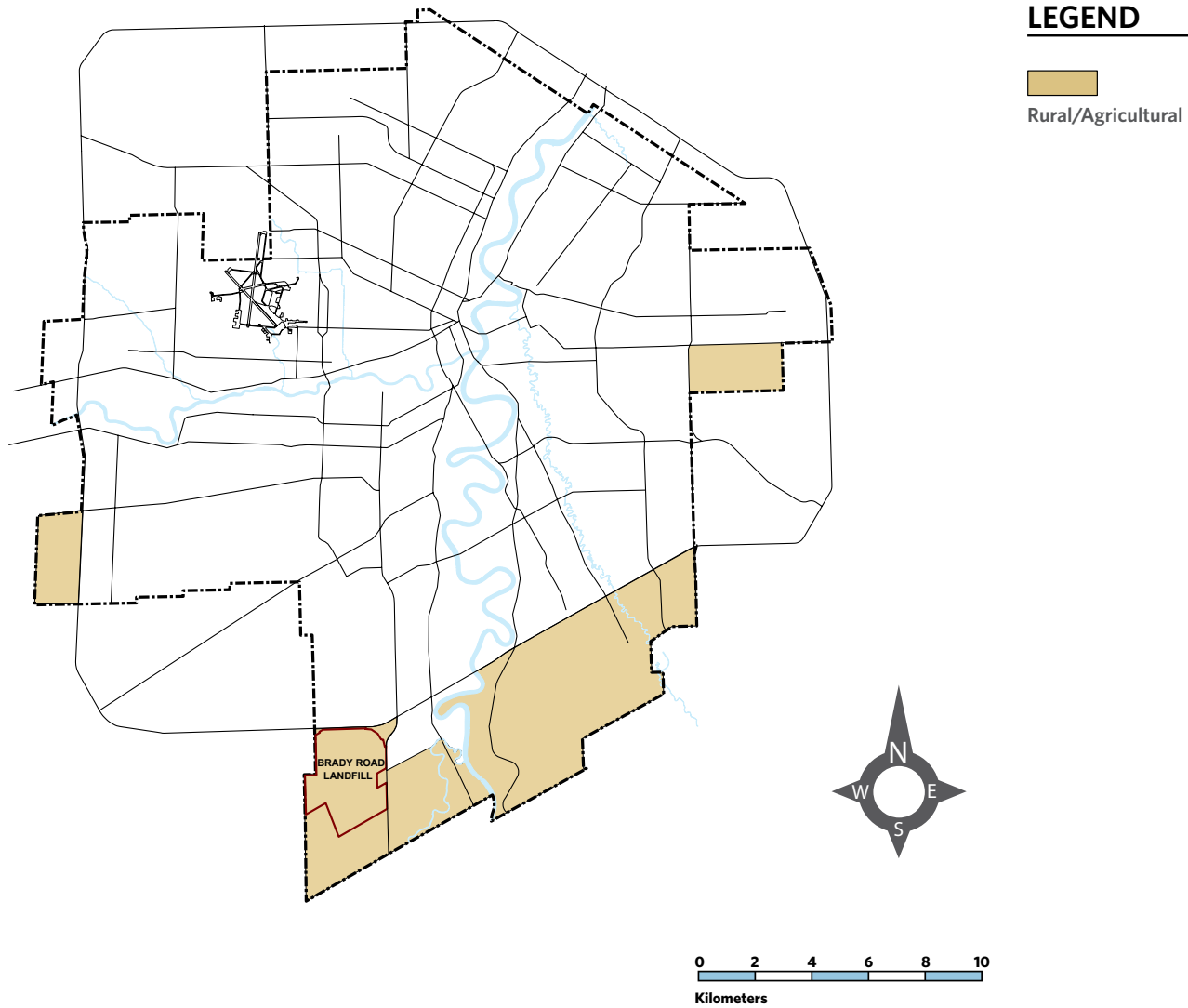
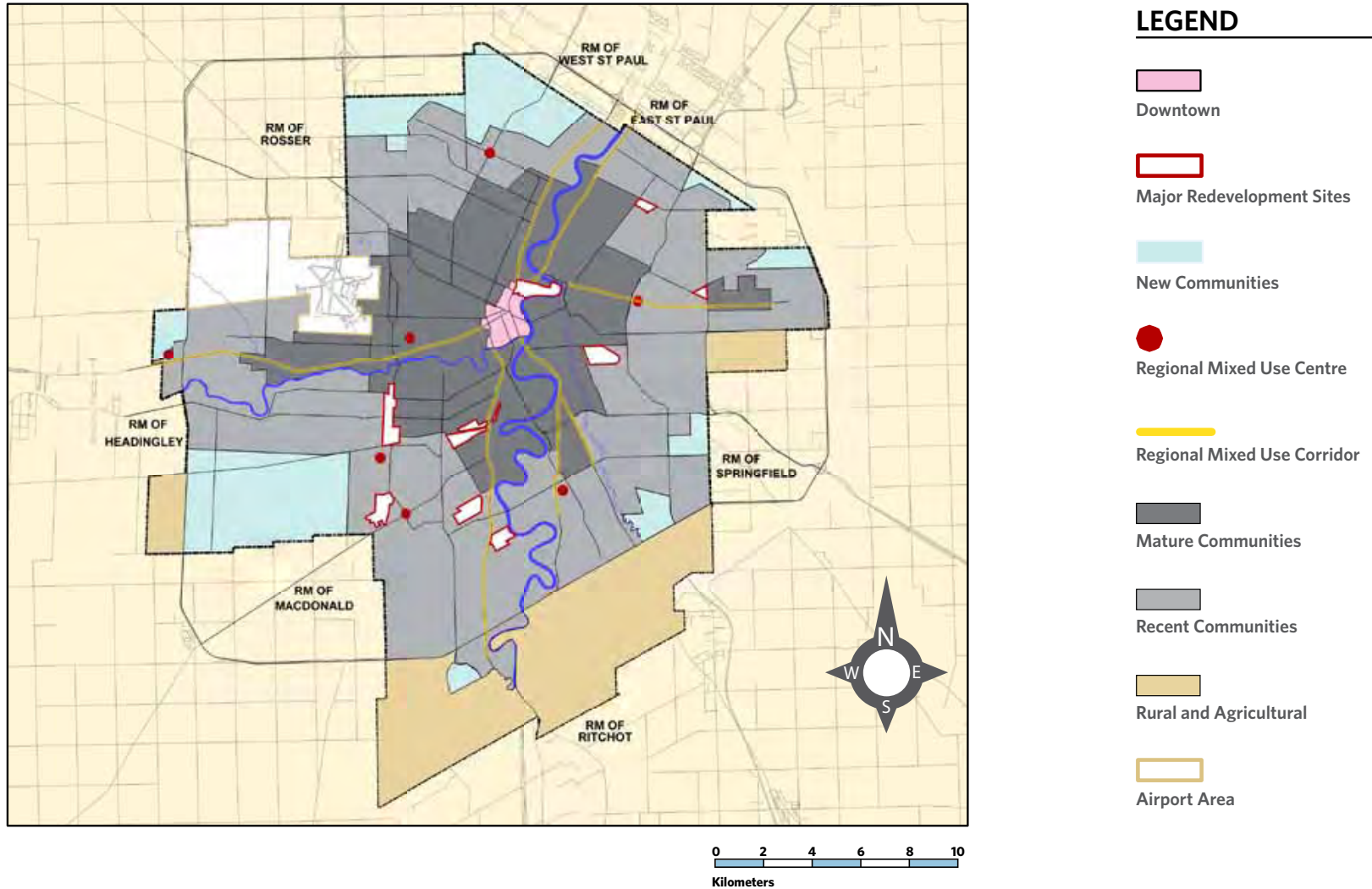


Figure 1-4

URBAN STRUCTURE



ENVIRONMENTAL IMPACT ASSESSMENT OF BRADY ROAD LANDFILL AND FUTURE RESOURCES MANAGEMENT FACILITY

December 22, 2011

landfilled at the BFI facility north of the North Perimeter Highway, in the R.M. of West St. Paul and at the MidCanada facility southeast of the City in the R.M. of Richot.



Photo 1-1: Aerial oblique view of landfill (facing east)

When waste haulers arrive on-site, the gross weight of the vehicle is established at a weigh-in station, and the trucks are directed to an active working face, where the materials are tipped from the truck onto a slope that is being worked by heavy-duty compaction equipment (Photo 1-2).



Photo 1-2: Typical working face and compaction equipment

Compacted waste is covered with daily cover each day, to minimize access by vermin and other nuisance vectors (e.g., migratory birds and gulls). When compacted wastes have reached the maximum elevation, a final cover of soil and native vegetation will be installed. “Special waste” can also be deposited on-site. Bagged asbestos, carcasses of dead animals and food products deemed to be unacceptable for some reason by the Canadian Food Inspection Agency (CFIA)

can be delivered to the site from time to time. Such wastes are buried immediately in locations recorded by GPS.

On-site composting (Photo 1-3) has occurred for over two decades, without complaint from adjoining landowners.



Photo 1-3: On-site composting of yard waste

Biosolids are now being co-deposited with the waste, due to a change in provincial policy regarding the application of biosolids to agricultural fields as a soil amendment. The long-standing licensed practice of land spreading of biosolids on selected lands approved for this purpose was ended by the City on December 31, 2010, as the result of new provincial regulations which reduced biosolids application rates to land (and banned winter application). Since then, the City has been examining various options for dealing with this material (including composting some of the material at the landfill), pending a longer-term solution.

1.2.3.2 *Planned Future Activities*

The site is comprised of approximately 790 ha. In the mid-1980s, the then-current development plan presumed that waste would be received without significant upstream diversion or minimization at the site for perhaps as much as a century. Implementation of the CIWMP will give rise to three fundamental changes affecting the long-term site use:

- The site will become a perpetual-care facility, with more land available for cell development than will likely be needed for at least the next century. Land previously thought necessary for waste burial but now unlikely to be needed for that purpose will be dedicated to waste diversion and public recreation.
- The previous conception of a 90 m hill at the site to facilitate public recreation, along with the original conception of a series of larger on-site ponds (Figure 1-5), has been significantly adjusted. The maximum elevation of the landform created by buried waste will now not

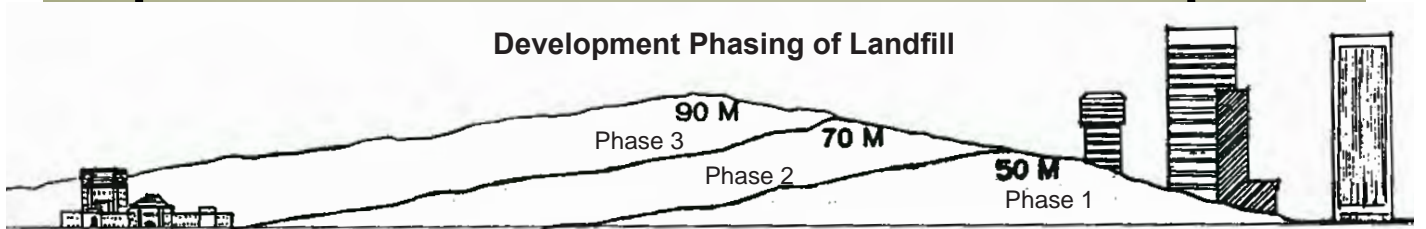
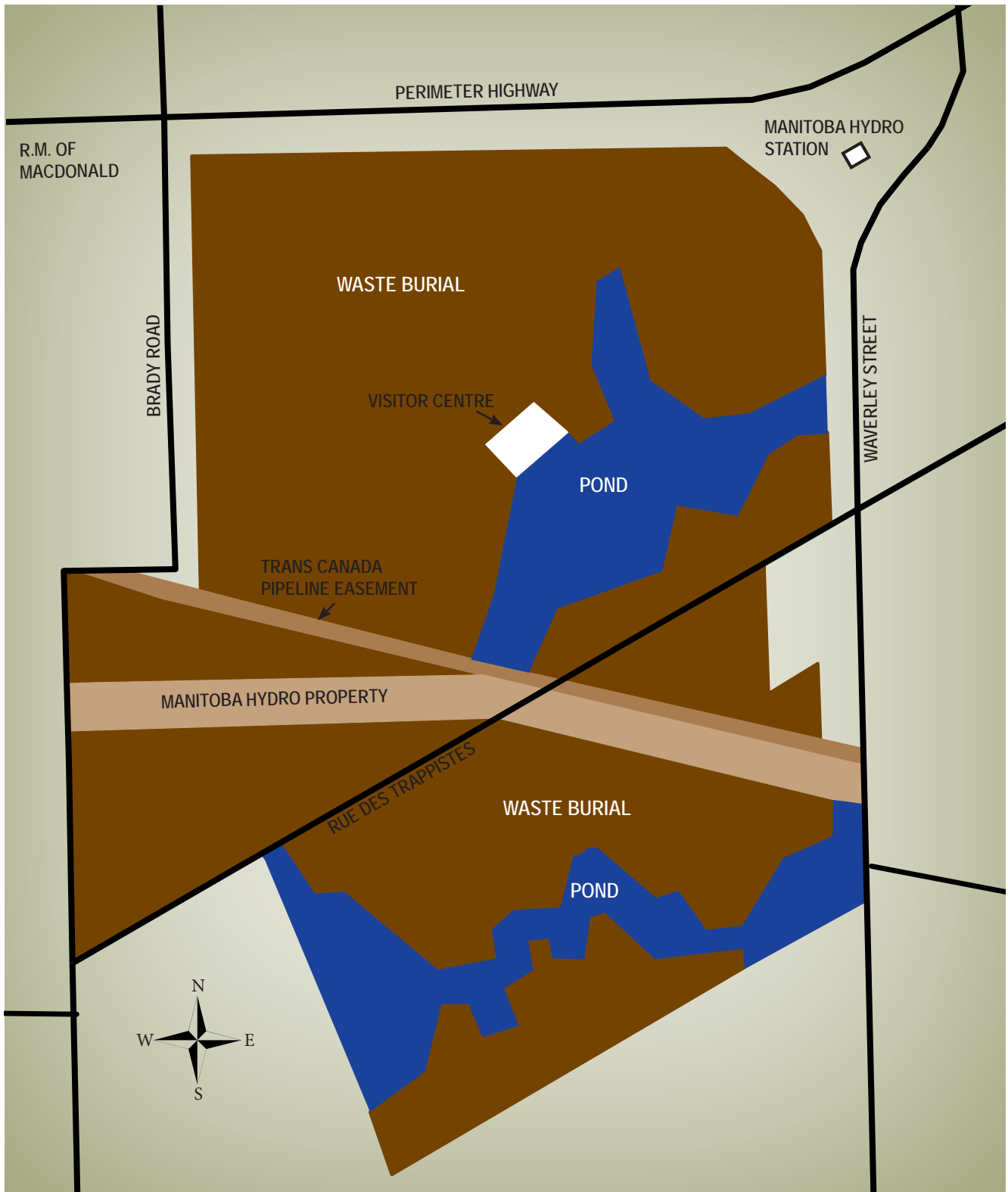


Figure 1-5
Original Site Development Concept in 1987

ENVIRONMENTAL IMPACT ASSESSMENT OF BRADY ROAD LANDFILL AND FUTURE RESOURCES MANAGEMENT FACILITYDecember 22, 2011

exceed 30 m above the prairie, and large ponds will no longer be contemplated except for dry ponds for runoff control or the sand-wash facility noted below. Because the facility is close to the southern approach to the Winnipeg International Airport, ponds will be discouraged on-site to reduce attraction to migratory birds, or will be designed and operated to minimize bird attraction and/or as “dry ponds.”

- Finally, the site will be the recipient of a significant landscaping effort, as portions of the site are completed, to encourage on-site public recreation and visual screening from adjoining lands. Vegetation of soil cover will occur in a portion of the current landfill being retrofitted for landfill-gas recovery. Starting initially with appropriate cultivars of fast-growing full-canopy trees (e.g., hybrid poplar), visual screening of the site will commence on the north and east sides, facing the growing subdivision development on these sides of the landfill. Slower-growing trees (e.g., willow and evergreens) will infill behind the poplars, to add to the visual screening and sound deadening, and to create year-round botanical screening and improved site aesthetics.

Specific additional new future activities include the following:

1.2.3.2.1 Recycling Centre

On-site recycling of materials is currently limited to metal goods, appliances (Photo 1-4) and used tires (Photo 1-5). There is also an operation to recover usable wood from diseased elm for use as flooring (with the residue being chipped; Photo 1-6). Future development of the site to increase the frequency and extent of materials diverted includes the allocation of space for a comprehensive Community Resource Recovery Centre (CRRC; e.g., Photo 1-7; Figure 1-2).



Photo 1-7: Typical Community Resources Recovery Centre



Photo 1-4: "White Goods" and other appliance segregation for recycling



Photo 1-5: Used tire segregation for recycling



Photo 1-6: Chipping of residue wood from wood wastes for recycling

The CRRC will accommodate mechanisms for recycling a much broader range of materials than are stored and recycled now, likely including household hazardous wastes and electronic wastes (“e waste”).

1.2.3.2.2 Composting Facility

Currently there is a windrow-type composting operation on-site that composts leaf and yard waste materials collected either at depots or curbside or delivered to the site (Photo 1-3). The composted product is used on-site for landscaping purposes. Under the CIWMP, this operation will be significantly expanded (Figure 1-2). Also under the CIWMP, a Source-Separated Organics (kitchen waste) program is to be implemented; however, the technology for composting this material has not yet been determined. Once determined, the SSO-management technology will be developed and housed on-site.

1.2.3.2.3 Sand-Wash Facility

The feasibility of recycling recovered sand from winter street sanding is currently being determined. With this concept, accumulated sand recovered from street-sanding operations after winter will be stockpiled on-site, and washed each summer using runoff stored in a new sand-wash pond facility. The washed sand would then be reused each winter on icy streets. The water accumulating in the sand-wash pond would be available for on-site firefighting.

1.2.3.2.4 Runoff Polishing

Whereas all surface runoff now flows naturally to the La Salle River without any on-site treatment, future alterations to the site will include provision of a new engineered wetland (e.g., Photo 1-8; Figure 1-2) for polishing of this runoff before it leaves the property.



Photo 1-8: Typical wetland

1.2.3.2.5 *Gas Recovery*

The City is in the process of retaining professional engineering services to design and develop a landfill gas-(LFG) recovery system (e.g., Photo 1-9; Figure 1-2). The LFG project, as noted in Section 1 above, has previously been reviewed and licensed by Manitoba Conservation. Initially, the recovered gas will be flared to reduce the greenhouse gas (GHG) content. As the evolution of deliveries to and burial at the facility occur during the implementation of the CIWMP, consideration will be given to alteration of the LFG facility. Depending on the proven amount and quality of the gas recovered, it may be possible that energy production can be achieved.



Photo 1-9: Typical landfill-gas recovery system

1.2.3.2.6 *Site Renaming*

The site will soon be renamed as the “Brady Road Resources Management Facility” to reflect the long-term vision of resource recovery and waste diversion. Signage at the site will soon acknowledge this new fundamental shift in and repurposing of the Brady Road Landfill. The “rebranding” of the site will emphasize the long-term materials-management and perpetual-care concepts that City Council adopted on October 19, 2011.

1.2.4 Approval Status

The site was developed after a comprehensive site-selection study conducted some 45 years ago (see Executive Summary of the “Site-Selection Report” attached as Appendix D). The site was permitted as a waste-disposal ground pursuant to Manitoba Regulation 150/91, on January 28, 1992, pursuant to *The Environment Act*. However, the site does not currently possess an *Environment Act* licence.

Because site attributes and operations do not impinge upon any known federal interest or fiduciary duty, there are no known requirements for federal permits, approvals or authorizations. Accordingly, there is no known non-compliance with federal regulatory requirements.

1.2.5 Public Consultation

The City engaged in an extensive process of dialogue with the general public, and an interest-based Stakeholders Advisory Committee (SAC), throughout 2011. The SAC was chaired by an independent moderator. Documentation of this process has been consistent, using many media.

Public consultations were undertaken jointly by the City and Stantec in respect of the current and proposed future Brady Road Landfill. A public meeting was convened in St. Norbert on October 27, 2011, for specific consultations on community views about the landfill. The attached report prepared by the City (Appendix E) details this consultation process. This process was also hosted by an independent moderator. (The Moderator’s Report is appended as Appendix F). Members of the public were pleased about the planned evolution of the Brady Road Landfill as a key expression of the consequences of Council adopting the CIWMP.

1.2.6 Description Of Existing Environment in the Project Area

The existing environment is described in Section 5. No rare, threatened or endangered species are known to be present on-site. The site land uses include an easement for an underground gas pipeline (Figure 1-1). There is no aquatic environment on-site and no associated fish resources, fish habitat, benthic invertebrates, or aquatic macrophytes.

The terrestrial environment has been greatly modified for purposes of either agriculture, on parcels not yet used for cell development, or for waste burial, in those parcels where cells have been developed over the past four decades (Photo 1-1).

In terms of the socio-economic environment, there are no known existing public safety or health risks within the development area beyond those associated with typical daily landfill operations. These matters are the subject of a new draft Operating Plan for the site which has been developing over the past two years for the site (Appendix G). The Standard Operating Procedures (SOPs) contained within the draft Operating Plan include many intended to prevent or minimize human-health or environmental risks. The draft Operating Plan requires further refinement and will, in any case, evolve over the years as a “living document.”

There are no affected areas (e.g., provincial parks) on the site, or adjacent to it. There are no known, or suspected, heritage resources on the site because of the extensive land use for agriculture and/or waste disposal for close to four decades.

There are no First Nations communities in the vicinity of the proposed development.

1.3 DESCRIPTION OF ENVIRONMENTAL EFFECTS OF THE PROPOSED DEVELOPMENT

This EIA represents a comprehensive consideration of the potential vectors for environmental impact in relationship to existing, and future, waste-management practices. The EIA has been prioritized to focus on the two vectors of greatest concern for landfills:

- The generation of leachate and its vertical migration through the protective clay liner systems and the underlying soils, with attendant implications on groundwater quality.
- Emissions (largely GHG and other gases) from the working face of the landfill and particulates from site roads and covered portions of inactive cells.

In addition to these two areas of interest, a variety of other potential vectors for impact have been considered in the EIA. These include surface runoff, transportation, visual intrusion, malodorous gas emissions, etc. As well, consideration was given to human-health effects from close to four decades of operation. This involved the retention of independent expertise (Manitoba CancerCare), and statistical analysis of health records, to explore the potential for longer-term impacts of past operations on health indices in census districts immediately adjacent to, and further away from, the landfill.

On the basis of the EIA, it has been concluded that there are no significant adverse effects from almost four decades of landfill operations that can be discerned from analysis of publicly available data describing community health, air quality and groundwater quality.

The EIA has also considered the consequences of future landfill design and operations as affected by implementation of the CIWMP. The consequences of reduced waste volumes, increased upstream diversion of recoverable materials, on-site processing and management of organic and inorganic materials in lieu of burial, and increasing vigilance to enforce community bylaws and waste-management policies, will be that the current “envelope” of discernible impacts can only be reduced. The proposed improvements in landfill design and operations should be characterized by a net improvement relative to the current situation.

1.3.1 Residual Effects

There are few residual effects associated with landfill operations as they now occur. The only long-term measurable effect of landfill operations is a very slight increase in chemicals associated with waste in the groundwater directly beneath the areas where waste has been buried. As indicated in the EIA, the concentrations of these chemicals do not approach action

levels (i.e., applicable water-quality guidelines). They should decline in future years in consequence of CIWMP implementation. The small quantities of these chemicals in the groundwater do not represent a public-health impact because the groundwater in question is saline (i.e., salty), and is not known to be used for domestic (i.e., drinking water or purchase water) purposes by any parties downstream.

The other significant residual vector from the landfill is landfill gas and associated occasional odour nuisance. As noted in the EIA and above, a landfill gas-recovery project is being implemented by the City. It will significantly reduce the volumes of gases, some of which are malodorous, released to the receiving airshed. Further, the City is planning for Best Practices in on-site SSO management, and composting, which should also reduce odour generation. The long-term operation of the LFG project (and any future SSO process) will also be the subject of monitoring, by means of systems specifically designed and installed for this purpose.

Accordingly, these residual effects are judged to be infrequent, transient and mitigable, and therefore “not significant.” The consequence of CIWMP implementation is that these vectors will be reduced in the future, due to the effects of reduced waste deliveries because of greater upstream diversion.

1.3.2 Monitoring and Accountability

Notwithstanding these findings, the longer-term monitoring of surface runoff, leachate, groundwater quality and (to a lesser extent) landfill gas emissions, will continue.

Monitoring networks for understanding leachate, runoff and groundwater chemistry have been assessed and found to be both substantial and appropriate. Parameters for surveillance have been improved, and the improved monitoring protocols and frequencies will continue to reflect all future monitoring efforts for decades to come. New groundwater-monitoring wells installed by the City have elaborated the architecture of the groundwater-monitoring system and this will further improve the long-term monitoring system effectiveness.

Monitoring of LFG and SSO management processes will be instituted as these projects are commissioned.

The City has committed that the annual results of monitoring will be documented and provided to Manitoba Conservation each year. The longer-term trend analyses of accumulated data will be specifically documented and shared with both Manitoba Conservation, and the public.

Lastly, the City has committed (Section 4.12) to some form of a periodic accounting to its various stakeholders by means of accounting instruments now widely used in the private sector (systems akin to the Global Reporting Initiative, or other forms of Corporate Sustainability Reporting).

1.4 DECOMMISSIONING

The current vision for Brady Road does not contemplate a traditional “decommissioning” of the facility. Rather, adoption of the CIWMP means that future landfill cells will be designed for buried wastes to be recovered at some future date. A cycle of waste burial, waste decay, waste stabilization, rest, and then selective cell mining is expected at the Brady Road facility in the decades to come.

2.0 Introduction

This Environmental Impact Assessment (EIA) is in support of the City of Winnipeg's (the City) application for an *Environment Act* Licence for the continued and future operations of the Brady Road Landfill Facility (the Facility), a 790-ha Class I Waste Disposal Ground serving the city of Winnipeg and broader region. As noted in s. 4.5.5, the landfill will be formally re-named "the Brady Road Resources Management Facility" to reflect the new vision for the use of the site.

2.1 BACKGROUND

The Brady Road landfill opened in 1973. It was selected for development as the City's sole final landfill based on the findings of a James F. McLaren Consulting Engineers Site-Selection report approved by City Council on July 31, 1985 (Kuluk, *pers. comm.* 2010; see also James F. McLaren report Executive Summary in Appendix D). It is currently operating under an Operating Permit (Waste Disposal Ground Operating Permit No.1-015; see Appendix A) from the Province issued in 1993. While the operation is permitted, a licence is required pursuant to Manitoba Regulation (MR) No. 150/91 ("*Waste Disposal Grounds Regulation*") under *The Environment Act*.

The City is required to license the facility. This requirement has underpinnings in a provincial process to improve the consistency of approaches to landfill licensing and permitting, and in a provincial initiative to reduce greenhouse gas emissions from major point sources (see Section 2.1.2 – Landfill-gas Recovery Project below).

2.1.1 Comprehensive Integrated Waste Management Plan

On October 19, 2011, City Council adopted the CIWMP which establishes a long-term (20-year) approach to the management of the City's waste. The purpose of the CIWMP is to:

- Provide direction for the City's waste-management system through recommendations to improve current waste-diversion programs.
- Make progress towards "zero waste" disposal goal (consistent with the definition espoused by the Federation of Canadian Municipalities).
- Address waste-processing and -disposal needs for the next twenty years.

The CIWMP seeks to improve waste diversion from the 2010 value of 17% to values exceeding 50%. A number of potential operating and design improvements have been identified for the Facility and are included in the new draft Operating Plan for the site (Appendix F). Key examples, among many others, include the following:

- Directing all residential traffic to a new Community Resource Recovery Centre (CRRC), which would reduce the amount of residential waste disposed at the facility and would allow for closure of the current residential tipping face.
- Operational improvements to the active tipping face.
- Improvements in leachate and landfill-gas management.

2.1.2 Landfill-gas Recovery Project

In 2008, the City initiated a process to seek regulatory approval of a landfill-gas recovery project at the Facility. It was advised by Manitoba Conservation that the recovery project would require licensing pursuant to s.10 of *The Environment Act*. Manitoba Conservation issued Licence No. 2890 for the operation of the landfill-gas recovery system on July 22, 2009.

As a condition of Licence No. 2890, the City was to file an application for an *Environment Act* licence for the Facility by October 1, 2010. Subsequently additional time for the filing of an EIA and application for the Facility licence was granted (i.e., until December 31, 2011).

2.2 OVERVIEW OF PROPOSED DEVELOPMENT

Within the meanings of “development” pursuant to the *Classes of Development Regulation* (MR 164/88), the “development” to be assessed and licensed is the Facility:

- As it is configured and operated in 2010.
- As it will be configured and operated pursuant to ongoing implementation of the CIWMP over the next decades.

Included in the “development” to be licensed are the following elements or attributes:

- Ongoing environmental monitoring.
- Support of periodic research and development, usually involving support for landfill-related topics of interest to engineers and scientists undertaking graduate studies.
- The Division’s commitment to ongoing public disclosure and accountability.

For clarity, the CIWMP is not part of the “development” to be licensed.

2.2.1 Current Configuration and Operation

The Facility currently holds approximately 8.5 million metric tonnes of waste. Assuming no change in the current disposal rate of 400,000 tonnes per year, the site has capacity for at least 100 more years.

The Brady Road landfill is currently used to dispose of: residential mixed loads (minimal separation of materials), commercial mixed loads, curbside collected materials, dewatered biosolids, and certain specialized material streams such as dead animals and asbestos waste. There are some diversion opportunities on-site: leaf and yard materials (separate drop off area and composting); diseased-trees wood waste (to flooring manufacturer); scrap metals, appliances with refrigerants, propane tanks, batteries, and bikes. However, in general, the facilities available for source-separated materials at the current site are minimal. There is some use of the landfill for waste outside Winnipeg originating within Manitoba. There are also some entrepreneurship activities and relationships for management of certain materials with the City (waste wood).

2.2.2 Planned Future Configuration and Operation

As the CIWMP is implemented, there would be a resulting shift in use of the Brady Road site from being primarily a “disposal facility” to a “resources-management facility.” New diversion infrastructure planned to be developed on the site in the near term includes:

- A CRRC for residents to separate and drop off materials, many of which can be diverted from the landfill. This could include household hazardous waste (HHW) and electronic material depots funded by the Provincial Stewardship program.
- Enhanced leaf- and yard-waste composting.
- A potential Material Recovery Facility (MRF), (to complement the existing private-sector MRF operated under competitive contract by Emterra Group [Emterra] at 1029 Henry Avenue).
- A “Green Park” that could encourage development of industrial/commercial enterprises that would focus on recovering value from various waste streams.

Over the mid- to long term, further changes at Brady Road arising from implementation of the CIWMP could include:

- A processing facility for Source-Separated Organics (SSOs).
- Bans on disposal of certain materials, assuming that options are in place, to divert drywall, shingles, organics, wood, cardboard and other materials.

In relation to “OurWinnipeg,” the City would allow increased use of the Brady Road site as a regional waste-management facility, accepting additional materials from surrounding rural municipalities for diversion, recycling and/or disposal.

The intended future new activities at the site will be protected by an alteration of the zoning applicable to the City’s properties, which amendment is planned by the City to occur in 2012.

2.3 NEED FOR THE DEVELOPMENT

The need for the Facility as it is is obvious and self-evident. Further, s.2 of the *Waste Disposal Grounds Regulation* compels municipalities, such as the City of Winnipeg, to make provisions for the disposal of waste created within its jurisdiction.

The Facility was well sited 43 years ago (Appendix D), operates well, provides a critical public service and does so with no significant public interest or concern.

That said, there is need for improvement.

Preliminary review of system performance, and review of the outcome of the “Speak up on Garbage Expo” held by the City on November 13, 2010 and many other public discussions (Appendix E) has refined understanding of the “problems” associated with the current solid waste-management system. These problems are among the factors driving improvement in the City’s waste-management programs and the production of the new CIWMP.

Among the implications of the CIWMP for the Brady Road landfill are the following:

- The need to obtain the required licence for the landfill, and to put into place all new designs and operating measures to more effectively use the existing disposal capacity.
 - The capacity at the Brady Road landfill is a resource that has great economic value to the broader community in the long term.
- The need for enhanced diversion of waste materials from the residuals stream to be disposed of at the landfill.
- The need for an improved layout and operating plan for the entire parcel of land owned by the City.

To address the needs of the City and the waste-disposal challenges, a new and more aggressive Vision for the future of waste management in the City is needed, to set a general direction for change. The process of developing the CIWMP took into account public discussions that have taken place through 2010 and 2011.

The CIWMP identified the need for increased diversion (including through materials reuse), the need to increase efficiency in how the landfill is used (e.g., to minimize environmental and social impacts), and the need to move quickly to a future where the Brady Road landfill operates well for many decades as a model waste-diversion and residuals-management facility.

2.3.1 Regional Requirements

Many waste-disposal grounds around the Province, including in the Capital Region, are nearing the end of their capacity or are located in less than perfect locations. These waste-disposal sites

could be closed either as their capacity is reached, as a result of environmental concerns, or as a result of regulatory action. If this happens, it may make sense to expand the collection of waste that would go to the Brady Road landfill to include waste from municipal jurisdictions near Winnipeg. Also, if waste disposal becomes more centralized and concentrated, it would be cost-effective to offer additional services at the Brady Road landfill rather than having smaller rural landfills trying to offer expanded services without the economies of scale that can finance the costs for modern environmental protection measures. These services would include a separate public waste drop-off with increased material recovery/recycling opportunity or perhaps services such as organics composting.

2.4 ALTERNATIVES

The following is a description of alternative means of providing waste disposal for the City of Winnipeg considered by the City and Stantec, followed by their consensus views on these options.

2.4.1 "Do Nothing"

The Brady Road landfill has operated since 1973, with few problems or complaints from citizens. The land base at Brady Road has sufficient capacity for at least another 100 years, based on current disposal rates. One potential scenario for going forward would be to maintain operations as they are currently. This would be the least-cost alternative and would not necessitate any changes to current operating procedures. If future product development leads to less packaging, more recyclable materials, etc. it is possible that the landfill could operate effectively for considerably longer than 100 years without large changes.

2.4.2 Incineration for Energy and Metals Recovery

Across Canada, the US, the UK, Europe, and Asia, many communities are evaluating new high-technology refuse-fired incinerators to serve as "Energy from Waste" (EFW) facilities. Since 2008, dozens of planned new incinerator sites across the UK have been proposed. The British government has committed billions to new energy-recovery incineration projects.

These initiatives are arising in response to new generations of incinerating technologies touted as the answer to both waste-disposal and energy-generation needs. These new technologies, variously called "gasification," "plasma gasification," "plasma arc," "pyrolysis" and "plasma torch" are collectively referred to as multi-stage EFW (or Waste-to-Energy [WTE] plants; www.water-leau.com/en/technology/new-waste/-waste; www.en.wikipedia.org/wiki/waste-to-energy; www.eon-energyfromwaste.com/en/Leistungen/568.aspx). Japan is one country investing substantially in modern EFW technologies, resulting in a consistent trend to less waste being landfilled annually (Hitachi 2011).

The City of Edmonton recently entered a 25-year contract to annually incinerate 100,000 tonnes of MSW at a new \$80 million gasification facility. The City of Edmonton considers WTE to be "proven" and has entered the world's first 25 year waste-to biofuels gasification contract with a

major municipality to produce methanol. The carbon-rich feedstock will include contaminated paper and cardboard, textiles, plastics that are not recycled, as well as old utility poles that have been treated with creosote and other chemical preservatives

(www.edmonton.ca/for_residents/garbage_recycling/biofuels-facility.aspx).

WTE companies have received millions of dollars in funding from Natural Resources Canada, Sustainable Development Technology Canada, Agriculture and Agri-Food Canada, Natural Resources Quebec, Alberta Energy Research Institute, and the City of Edmonton.

Partly because of the financial and policy commitments of such other utilities and jurisdictions, and after the success of its own WTD facility since 1988

(www.metrovancouver.org/services/solidwaste), the City of Vancouver has initiated a public-consultation process to consider its commitment to many new EFW plants.

Because combustion of the organic-waste materials leaches residual metals in the ash (including the fly ash captured in pollution-control equipment), the ash is a potential source of metals, a virtual metal “ore” that can be processed for metals recovery (Nashco 2011).

2.4.3 Different Location

Winnipeg is expanding at a rate that will see few non-residential land uses within the Perimeter Highway within the next three decades. Development pressure continues on lands outside the Perimeter Highway. This could potentially cause difficulties with the operation of Brady Road landfill. Even without expansion beyond the Perimeter, the development of the Waverley West subdivision as far south as the Perimeter Highway has the potential to be problematic. Once Waverley West is completed, there will be expensive homes located within approximately 500 m of the landfill. Although City staff is planning the future development of the Brady Road site to expand away from such developments (Waverley West and St. Norbert), there is still the possibility that there could be significant concern, even opposition, expressed by the landfill's growing number of residential neighbours.

One way of alleviating or precluding those problems would be to move the landfill further away from the City.

2.4.4 The BFI “Prairie Green” Alternative

There is one large private-sector landfill located near Winnipeg. The Browning-Ferris Industries (BFI) “Prairie Green” landfill is located around 17 km northwest of the City Centre and disposes of around 200,000 tonnes per year. The site comprises approximately 603 ha, 90 ha of which are permitted to receive non-hazardous solid waste. To date, BFI Canada's Winnipeg landfill has received no significant criticism from provincial environmental regulators regarding its licence. There are approximately 8.35 million tonnes of remaining airspace capacity at this site.

Based on current daily disposal volumes received at the BFI site, and the geographic configuration and construction of the BFI landfill, management estimates that the site has a projected operating life of approximately 35 years.

It is believed that the majority of IC&I waste generated in the City is disposed at this landfill, based on IC&I generation rates.

The City of Winnipeg has an agreement with BFI Canada that allows the City to dispose of residential garbage at the "Prairie Green" landfill. Under the agreement, 12,000 tonnes of residential waste can be deposited at this landfill annually. It may be that, in this scenario, the agreement could be renegotiated to allow substantially greater deliveries.

2.4.5 Consideration of Alternatives

The City and Stantec have carefully considered these alternatives. Their consensus views are that:

- The "Do Nothing" alternative is unacceptable for regulatory, economic and policy reasons:
 - A condition of Licence No. 2890 (landfill-gas recovery system) compels the City to licence the landfill.
 - The current operations are less efficient than desirable, without optimization of airspace, without maximization of materials diversion and recovery, and without on-site provision for functions now known as necessary (e.g., on-site firefighting capacity) or becoming necessary through implementation of the CIWMP (e.g., e-waste recovery, composting, drywall recovery, enhanced wood diversion, materials reprocessing, etc.).
 - The former Premier publically committed to licensing the landfill as a collateral component of the Landfill-Gas Recovery project endorsed by the Province pursuant to its policies for accord with the Kyoto Protocol on Climate Change.
- The "EFW/WTE energy-recovery" option is unnecessary and uneconomic and would likely raise public concerns:
 - Manitoba enjoys reportedly the lowest-cost residential power in continental North America, thus reducing the economic feasibility of an EFW facility here.
 - The Brady Road landfill has at least ten decades of capacity, further reducing need for an EFW plant.
 - Any City commitment to an EFW plant would almost certainly engender significant public concern and even opposition, if experience elsewhere is any predictor.

- The “different location” option is unacceptable for economic and policy reasons:
 - The current site has over ten decades of capacity remaining, rendering the need to move to seek more capacity unnecessary.
 - The current site has sufficient underlying protective clay soils and lateral buffer zones, and such planned improvements in visual screening, trucking access, site layout and operations, and public engagement as to be able to minimize public concerns.
 - Moving all new cells to a new site would create two sites, creating the potential for additional environmental footprint and higher operating costs.
 - Moving the site for proposed materials recovery and reprocessing, and adding economic value to recovered materials (“commoditization”) increases haul costs to and from the City, thus making the MRF and “Green Industrial Park” at needless economic risk.
- The “BFI landfill” option is unacceptable for legal, economic and policy reasons:
 - Renegotiating the current agreement to allow much greater diversion of City wastes to the BFI site could create the potential, through the vehicle of new costs- and responsibility-sharing agreement, to share in any existing legal environmental liability for the consequences of current (and historic) operations at this site.
 - Diverting significant mass of garbage to the BFI site would reduce the mass of recovered materials at the Brady Road site, and the economic return from their commoditization, while this return would accrue to BFI (a potential form of perceived “purchase subsidy”).

The City has committed to the concepts in and implementation of the CIWMP (Appendix C). It believes that implementing the CIWMP will significantly improve landfill appearance, operations efficiency and materials recovery and sale, while reducing long-term liability and the already low incidence of nuisance-odour emissions, the low risk to underlying (saline) groundwater and future concerns about public-access risk or constraints on property values.

The City has determined to proceed with upgrading the landfill and its operations consistent with the Vision embodied in the CIWMP.

2.5 FORMAT OF THE EIA

The balance of this EIA document is presented in the following format:

- **Section 3 - Regulatory Framework:** describes key statutes and legislation that are applicable to the operation of the Facility.
- **Section 4 - Project Description:** describes the facility as it is and as it will be under the comprehensive integrated waste management plan, including operating procedures.

- **Section 5 - Site Description:** the existing environment of the facility site and surrounding environment is described, including the physical, biophysical and socio-economic environment.
- **Section 6 - Public Consultation:** a summary of public participation activities is provided.
- **Section 7 - Approach to Environmental Impact Assessment:** the approach to the environmental impact assessment is provided, including guiding principles, activities undertaken in support of the assessment and the provincial regulators acceptance of the approach.
- **Section 8 - Environmental Effects Assessment:** an assessment of anticipated environmental effects is provided for normal and upset conditions, as well as mitigation measures and operating procedures.
- **Section 9 - Future Developments:** anticipated future developments at the facility as a result of the CIWMP are described.
- **Section 10 - Facility Decommissioning:** the activities to be undertaken to decommission the facility and the potential subsequent land uses are identified and described, as well as measures to satisfy provincial requirements.

Section 3 following describes the Regulatory Framework.

3.0 Regulatory Framework

Key statutes and regulations comprising the regulatory framework for the operation of waste disposal grounds (WDG) in Manitoba are presented below.

3.1 PROVINCIAL STATUTES AND REGULATIONS

- *The Environment Act, c. E125*

- *Classes of Development Regulation, Man. Reg. 164/88*

Presently, Class 1 WDGs are considered Class 1 Developments as defined by the *Classes of Development Regulation, MR 164/88 of The Environment Act, c. E125* and thereby require licensing under section 10 of the Act. Proposed amendments by Manitoba Conservation to MR 164/88 and the Act would reclassify a Class 1 WDG as a Class 2 Development, thereby requiring licensing under section 11 of the Act. The proposed amendment is intended to address the erroneous classification of Class 1 WDGs as Class 1 Developments (Burland Ross, *pers. comm.*, 2009). Accordingly, the City's proposal is submitted pursuant to Section 11 of the Act.

- *Waste Disposal Grounds Regulation, Man. Reg. 150/91*

The disposal of waste in Manitoba is provincially regulated by the *Waste Disposal Grounds Regulation, MR 150/91 of The Environment Act, c.c.s.m. c. E125*. Pursuant to MR 150/91, the Brady Road Landfill facility is considered a Class 1 Waste Disposal Ground, or the largest category of landfill in Manitoba, defined by the Regulation as a disposal ground that serves a population greater than 5,000 persons.

- *Litter Regulation, Man. Reg. 92/88 R*

- *Pesticides Regulation, Man. Reg. 94/88 R*

- *The Dangerous Goods Handling and Transportation Act, c. D12*

- *Special Waste (Shredder Residue) Regulation, Man. Reg. 113/2003*

Shredder residue, or the residue generated from shredding vehicles, appliances or other sources or recyclable steel, is considered a special waste pursuant to the provisions of the *Special Waste (Shredder Residue) Regulation, 113/2003 of The Dangerous Goods Handling and Transportation Act, c.D12*. Shredder residue may be disposed of as intermediate cover at a Class 1 waste disposal ground if the following conditions are met:

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- The Class 1 waste disposal ground is licensed under *The Environment Act*, c.E125 and has an operating permit under the *Waste Disposal Grounds Regulation*, 150/91 and is approved to accept such wastes.
- The operator of the facility that generates the shredder residue (i.e., the scrap metal facility) has a Director-approved protocol for the proper transportation and minimization, sampling, analyzing and reporting of contaminants of ASR.
- *The Ozone Depleting Substances Act*, c. O80
 - *Ozone Depleting Substances and Other Halocarbons Regulation*, Man. Reg. 103/94
- *The Water Protection Act*, c. W65
- *The Public Health Act*, c. P210
 - *Collection and Disposal of Wastes Regulation*, Man. Reg. 321/88 R
 - *Protection of Water Sources Regulation*, Man. Reg. 326/88 R
- *The Workplace Safety and Health Act*, c. W210
 - *Workplace Safety and Health Regulation*, Man. Reg. 217/2006
- *The Waste Reduction and Prevention Act*, c. W40
 - *Electrical and Electronic Equipment Stewardship Regulation*, Man. Reg. 17/2010
 - *Household Hazardous Material and Prescribed Material Stewardship Regulation*, Man. Reg. 16/2010
 - *Packaging and Printed Paper Stewardship Regulation*, Man. Reg. 195/2008
 - *Tire Stewardship Regulation*, 2006, Man. Reg. 222/2006
 - *Used Oil, Oil Filters and Containers Stewardship Regulation*, Man. Reg. 86/97
- *The Sustainable Development Act*, c. S270
 - *Sustainability Guidelines for Local Governments, School Divisions, Universities, Colleges and Regional Health Authorities Regulation*, Man. Reg. 4/2004
- *The City of Winnipeg Charter*, c.39
- *The Municipal Act*, c. M225
- *The Climate Change and Emissions Reduction Act*, c. 135
 - *Prescribed Landfills Regulation*, MR. 180/2009

3.2 PROVINCIAL GUIDELINES

- Guidelines for the Storage of Scrap Tires in Manitoba, Manitoba Environment Guideline No. 94-04E
- Draft Manitoba Compost Facility Guidelines, June 2001
- Guidelines for the Management of Waste Materials Containing Polychlorinated Biphenyls (PCBs)
- Guidelines for the Siting of a Class 1 Waste Disposal Ground in Manitoba, Guideline No. 94-91E
- Solid Waste Management Facility Guidelines

3.3 MUNICIPAL BYLAWS AND GUIDELINES

- City of Winnipeg Solid Waste Bylaw No. 1340/76
- City of Winnipeg Bio-medical Waste Sharps Bylaw No. 6001/92
- City of Winnipeg Neighbourhood Liveability Bylaw No. 1/2008
- Standards and Guidelines for the Mitigation of Methane Gas at Buildings and Utilities, and Guidelines for Construction on Landfill Sites, December 2006

3.4 PROVINCIAL AND MUNICIPAL POLICIES

- Western Climate Initiative
- “OurWinnipeg” Bylaw No. 67/2010
 - Sustainable Water and Waste Direction Strategy

3.5 FEDERAL STATUTES AND GUIDELINES

- *Migratory Birds Convention Act*
- *Fisheries Act*
- CCME Canadian Drinking Water Quality Guidelines

