Decommissioning and redeveloping a small arms manufacturing facility site

By Doug Dolby

Original building section of the Dominion Arsenal Lindsay occupied by the brass foundry and coal gasification plant. Upon its final use as a manufacturing facility this portion of the building manufactured inner tubes for various types of equipment.

In September of 2006, Terrasan finalized the purchase and acquisition of a 60 acre parcel of land known as the Dominion Arsenal Lindsay and began the appropriate steps to redevelop this historic property.

The property was utilized for industrial manufacturing purposes, from the construction in 1914 of a small arms manufacturing facility, owned and operated by the Canadian government, up until its closure in June 2005 as a rubber manufacturing facility.

When Terrasan acquired the derelict and under-utilized property, it housed nine interconnected buildings, totaling approximately 200,000 ft^2, three outbuildings, one partially-submerged concrete munitions' test firing range, and eight former munitions' storage cells.

The property is located in the south end of Lindsay, Ontario, and is surrounded by residential, parkland and institutional property uses. Although the site was zoned General Employment, the City of Kawartha Lakes recognized that it was not a long-term General Employment use site.

As a result, Terrasan put forth a site development plan that encompasses a mixed use plan, incorporating residential, light industrial, commercial and institutional land uses. The proposed architectural design is based on stewardship concepts which will focus on environmental responsibility, resource efficiency, occupant comfort and well-being, and community development.

The pre-purchase, due diligence review completed by Terrasan, prior to acquiring the site, revealed that the various decommissioning works required for redevelopment would cost in excess of $5 million and would include hazardous material abatement, structural demolition and subsurface soil and groundwater remediation.

Upon a thorough review of the overall site conditions, including salvage opportunities, implementation of building reclamation strategies, resource material recovery opportunities, as well as implementing sustainable remedial strategies, the site decommissioning costs were calculated to be well below the original estimate of $5 million.

Terrasan has completed an extensive hazardous material abatement program, which involved the removal of asbestos containing materials (ACMs), mercury, polychlorinated biphenyls, and hazardous chemicals located throughout the building.

The asbestos abatement work component included the containment and removal of the asbestos-containing pipe insulation wrapping located along the 20 ft high ceilings throughout the nine interconnected buildings and the three outbuildings, and the subsurface aerosol boiler pipe wrapping located within subsurface trenches located throughout the property.

PCB decommissioning at the site meant the removal of all light ballasts, and transformer decommissioning.

Demolition activities took place in 2007. On-site structural demolition was performed by mechanical means, utilizing tracked excavators with various demolition-related attachments such as grapples, shears and pulverizers to expedite efficiency. Demolition activities adhered to the Waste Audit Report.

The purpose of the waste audit was to determine the amount of demolition material which could be reduced, reused and recycled. It was determined that approximately 99% of the demolition material, including all concrete,

Proposed Master Plan Concept looking from the southeast.

brick, concrete block, ferrous and non-ferrous metal, and wood, could be re-implemented into the new development plan or sold as processed recyclicate.

A review of the subsurface soil and groundwater conditions at the site revealed that contaminants of concern consisted of chlorinated solvents, petroleum hydrocarbons, polycyclic aromatic hydrocarbons and various heavy metals. At this time, Terrasan is in the process of reviewing the feasibility and cost-effectiveness of utilizing various remedial strategies. The remedial options being considered for the project are: ex-situ bioremediation in constructed bio cells; ex-situ and *in situ* chemical oxidization; groundwater "pump and treat" through installed extraction wells; and solidification/stabilization of the surficial soils impacted with heavy metals.

To expedite the development process, Terrasan has sub-divided the property into a 20 acre parcel and a 40 acre parcel. The rationale behind this methodology is to seek two separate Records of Site Conditions (RSC). The 20 acre parcel of land, located to the northwest of the property, housed the industrial buildings and, therefore, subsurface soil and groundwater impacts are more predominant in this area of the site. The 40 acre parcel located to the south of the property has remained primarily untouched by industrial usage.

Completing two separate RSCs will enable development to commence via a tiered approach by initiating development within the 40 acre parcel and remediating the 20 acre parcel in tandem.

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