

SYDNEY TAR PONDS



HIGHLIGHTS:

DESCRIPTION:

Large scale rehabilitation of contaminated urban site

LOCATION:

Sydney, Cape Breton Island, Nova Scotia

CLIENT:

Nordlys Environmental, LP
(ECC and Zutphen Construction joint venture)

PROJECT TIMELINE:

October 2009 – 2012

SERVICES PROVIDED:

- Mix design optimization
- Testing

CONSULTANCY:

Process planning, logistics

MATERIALS SUPPLIED:

70,000 MT GU cement

A CENTURY OF TOXIC RUN-OFF FROM STEEL INDUSTRY CREATED THE MOST TOXIC HAZARDOUS WASTE SITE IN NORTH AMERICA

Nearly a century of steel and coke production on Cape Breton Island, Nova Scotia, left behind over a million tonnes of contaminated soil and sediment in the Sydney Tar Ponds.

The contaminants included heavy metals, PAHs and 3.8 tonnes of polychlorinated biphenyls (PCBs). Experts called the Sydney Tar Ponds the most toxic hazardous waste site in North America. Local residents agreed, the toxic ponds lay within the boundaries of a city with 25,000 inhabitants, who had been smelling the odours and living with the health consequences.

IT WOULD BE THE MOST COMPLEX ENVIRONMENTAL CLEANUP EVER UNDERTAKEN IN CANADA

A comprehensive environmental site assessment revealed that it was too risky to move the contaminated material. An attempt at low-temperature incineration proved ineffective and costly, and was abandoned. Solidification and Stabilization (S/S) with cement was determined to be the best way to contain the contaminated material. However, the process would not be simple. It would be the most complex environmental cleanup ever undertaken in this country.



Lafarge worked with the Cement Association of Canada to help Nordlys Environmental, LP, submit the winning bid for the S/S contract for over 700,000 cubic meters of impacted sediment. Lafarge's portland cement was selected as the binder to encapsulate and stabilize the waste. The challenges began.

HOW DO YOU EXECUTE A MAJOR ENVIRONMENTAL CLEANUP IN THE MIDDLE OF A CITY?

Lafarge engineers and consultants were active in the two-and-a-half years of extensive discovery, testing and optimization to develop a comprehensive plan. The logistics of undertaking a major environmental cleanup within a four kilometer radius of 25,000 people was a daunting task. The cleanup was done at a rate that kept odour low and emissions at a safe level for workers and residents.

Fourteen truckloads of Lafarge's cement rolled onto the site every day from the cement plant at Brookfield, Nova Scotia. The relatively short haulage distance meant there was no need for on-site storage to be built on or near a toxic waste site. The cement was brought in just in time to be used in the highly orchestrated S/S process.

The two-metre deep sediment was treated using a cell-by-cell technique. Cement was blown into a 40' bottomless container placed on the ground. The dust was knocked down before the excavator agitated the cement and soil together. The stabilized material was tested to ensure it met the performance criteria of unconfined compressive strength, permeability and leachability. The container was then lifted up and the cement matrix locked in contaminants as it hydrated. The chemical reaction between the heavy metals and the high pH level of cement immobilized pollutants by making them insoluble.

These steps were repeated on a GPS guided grid as the in-situ rehabilitation hop-scotched across the brownfield. Treated soil and sludge was covered with a clay layer engineered cap, which was layered with topsoil and seeded with grass.

CHILDREN PLAY ON A RAINBOW STRUCTURE ABOVE WHAT WAS ONCE A TOXIC WASTE POND

The grey tar ponds have been replaced by the green of Open Hearth Park. Children play on a rainbow structure above what was once a toxic waste pond.

Lafarge supplied over 70,000 MT of GU cement for the Sydney Tar Ponds rehabilitation. Lafarge's experts tested and developed mixes as well as consulted in process planning and logistics.

As a result of its involvement in the Sydney Tar Ponds Project, Lafarge has become known as experts in soil S/S and have leveraged the learnings from this massive project for other brownfields remediation.



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