
Final

ArcelorMittal Dofasco Kenilworth Avenue Boat Slip Remediation Project

Summary of the Project Description

Prepared for
ArcelorMittal Dofasco

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CH2MHILL®

72 Victoria Street South Suite 300
Kitchener, ON N2G 4Y9

Summary of the Project Description

1.1 General Information

Previous environmental investigations have identified the presence of PAHs and PCBs in the ArcelorMittal Dofasco Boat Slip. PAHs and PCBs have the potential to negatively impact local aquatic organisms and as such, ArcelorMittal Dofasco, is proposing to proceed with a sediment remediation project. Furthermore, because of the historic industrial and urban development around Hamilton Harbour, the harbor has been identified as an Area of Concern (AOC) by the Canada-United States Great Lakes Water Quality Agreement (GLWQA). Although there are many actions required to delist Hamilton Harbour as an AOC (including but not limited to sediment remediation at Randle Reef, improvements to waste water treatment plants discharging to the harbor, implementation of fisheries management plans, etc.) by remediation of the sediments in the ArcelorMittal Dofasco Boat Slip will aid in delisting Hamilton Harbour as an AOC.

To accomplish this remediation,

ArcelorMittal Dofasco is proposing to implement a sediment remediation project that will involve:

- The encapsulation of sediments containing PCBs greater than 50 µg/g using an engineered cap
- The construction of an ECA along the eastern shoreline of the Boat Slip to encapsulate the majority of sediments containing elevated concentrations of PAHs and metals
- The relocation of sediments with concentrations of total PAHs exceeding 100 µg/g outside of the ECA footprint into the ECA; the volume of sediments to be relocated are estimated to be less than 40,000 cubic metres (m³). Sediments found to have naphthalene exceeding 100 µg/g will be transported off-site for disposal as hazardous waste. Sediments with total PAH concentrations less than 100 µg/g will remain in place and will not be dredged.
- Installation and operation of a mobile, temporary water treatment system that will be set up onsite to manage water generated during dredging
- An engineered sand cap will be placed over dredged areas to manage post-dredge residual contamination that may be present as a result of sediment resuspension during dredging. It will also provide habitat for fish and benthic invertebrates within the Boat Slip.
- Long-term monitoring of the ECA to confirm that it continues to function as designed.

1.1.1 Proponent Information

1.1.1.1 Name of Designated Project

The name of the Project for the purposes of this Project Description is the “ArcelorMittal Dofasco Boat Slip Remediation Project.”

1.1.1.2 Name of Proponent

ArcelorMittal Dofasco is currently the sole proponent for the Project.

1.1.1.3 Address of the Proponent

The Address of the Proponent is:

ArcelorMittal Dofasco
1330 Burlington St. E.
Ontario, Canada
L8N 3J5

1.1.1.4 Site Map and Plan

The site is located along the southern shore of Hamilton Harbour at 1495 Burlington St. E., Hamilton, Ontario, L8N 3J5. The Boat Slip is adjacent to Piers 20 and 21, at the end of Kenilworth Avenue N in the southeastern corner of the Harbour. Land access to the site is via ArcelorMittal Dofasco Gate 15 off Ottawa Street. The location of the site is shown in Figure 1. The Project will be completed within ArcelorMittal Dofasco property. ArcelorMittal Dofasco owns the Boat Slip/waterlot and the lands immediately surrounding it.

1.1.1.5 Coordinates

The entrance to the Boat Slip is located at latitude 43 degrees (°) 16 minutes (') 33 seconds (") north (N), longitude 79°47'45" west (W).

1.1.1.6 Legal Property Description

The legal description of the Boat Slip area is as follows: Lot 3, Broken Front Concession, Township of Barton, Plan 62R-483. The waterlot and the land on the south, east and west are owned by ArcelorMittal Dofasco. The HPA (a federal Authority) owns a waterlot located approximately 450 m away from the northern limit of dredging within the Boat Slip.

1.1.1.7 Land Use

Public access to the site is not permitted, and security measures are in place to restrict access. Recreational uses (for example, boating and fishing) can occur in proximity to the site within the open water of the Harbour.

The Boat Slip is not used for commercial, recreational, or Aboriginal fisheries

1.2 EA Requirement

According to the CEAA 2012, at least one component of the Project meets the definition of "hazardous waste" in Section 1 of the *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations*. Two chemicals were measured at levels exceeding their respective criteria; therefore, would be designated as hazardous wastes. PCBs were measured at concentrations greater than 50 µg/g, and total naphthalene was measured at levels greater than 100 µg/g. Note that the MOECC does not consider naphthalene at the concentrations measured in the Boat Slip to be hazardous wastes.

As described in Section 2, all sediments containing PCBs greater than 50 µg/g will remain in place and will be covered by an engineered cap. The engineered cap is intended to provide physical isolation of the contaminated sediment sufficient to reduce exposure due to direct contact, and also reduce the ability of burrowing organisms to move contaminants to the surface (bioturbation). It will be designed to minimize potential erosion of the cap, which will reduce the potential for resuspension and transport of contaminated sediments.

The CEAA 2012 was reviewed for this Project in consultation with the CEAA and EC. Section 29 of the Schedule under the Regulations Designating Physical Activities indicates that "the construction, operation, decommissioning and abandonment of a new facility used exclusively for the treatment, incineration, disposal or recycling of hazardous waste" triggers the application of the CEAA 2012. The proposed remedial strategy for this Project involves the in situ encapsulation of the sediments containing PCBs greater than 50 µg/g. With respect to naphthalene, the ECA will be constructed such that its footprint will be located overtop of the majority of sediments containing naphthalene with concentrations over 100 µg/g. Sediment from areas outside of the ECA where preliminary investigations indicated that naphthalene may be at concentrations over 100 µg/g will be dredged and segregated from other dredged sediments for additional testing. It is likely that the sediments from these areas will temporarily be placed onto a barge within the Boat Slip. Additional chemical analyses will be completed on these sediments and the concentrations of naphthalene determined. If in fact, the sediments possess naphthalene concentrations over 100 µg/g, they will be dewatered for off-site disposal as a hazardous waste and transferred to an appropriately licensed

landfill. If the sediments are determined to possess naphthalene concentrations below 100 µg/g, they will be placed within the ECA either by a mechanical dredge or hydraulically. The sediments placed within the ECA will be covered with an engineered cap. The combination of the sheet pile used to construct the ECA and the engineered cap placed on top of the sediments will provide physical isolation of the sediments from the environment. After construction of the ECA, a long-term monitoring program will be implemented to ensure that it is functioning as designed.

The physical works and activities involved in managing the sediment fractions as described above, have been interpreted to comprise “the construction, operation, decommissioning and abandonment of a new facility used exclusively for the treatment, incineration, disposal or recycling of hazardous waste” which is a designated Physical Activity under the Regulation.

1.3 Project Proximity to Residences, Traditional Territories, Federal Lands

The site is located in a heavy industrial area, and there are no residential areas in close proximity to the site. Based on aerial photographs the nearest residential property is approximately 830m from the Dofasco Property boundary and approximately 1200 m from the edge of the estimated work area (Figure 2).

As shown on Figure 5, the nearest First Nation Community to the site is the Six Nations Indian Reserve no. 40. The edge of the Six Nations Community is approximately 26km from the site.

The nearest Federal Lands are those owned by the Hamilton Port Authority (HPA) located directly to the north of the Boat Slip (Figure 2). Based on this figure, it is anticipated that the HPA waterlot is located approximately 450 m away from the northern limit of dredging within the Boat Slip.

1.4 Physical Works

As indicated above, the project will involve:

- The construction of an ECA to encapsulate the majority of sediments containing elevated concentrations of PAHs and metals.
- Installation and operation of a mobile, temporary water treatment system that will be set up onsite to manage water generated during dredging.
- Insitu capping of PCBs greater than 50 µg/g using an engineered cap
- The relocation of sediments with concentrations of total PAHs exceeding 100 µg/g outside of the ECA footprint into the ECA; the volume of sediments to be relocated are estimated to be less than 40,000 cubic metres (m³). Sediments found to have naphthalene exceeding 100 µg/g will be transported off-site for disposal as hazardous waste. Sediments with total PAH concentrations less than 100 µg/g will remain in place and will not be dredged.
- An engineered sand cap will be placed over dredged areas to manage post-dredge residual contamination that may be present as a result of sediment resuspension during dredging. It will also provide habitat for fish and benthic invertebrates within the Boat Slip.
- Long-term monitoring of the ECA to confirm that it continues to function as designed.

1.4.1 ECA Construction

As much space as possible is needed within the Boat Slip to facilitate ArcelorMittal Dofasco’s shipping operations. In situ capping of all sediments within the Boat Slip is an unacceptable approach as it would reduce water depths and freighters would not be able to use a significant portion of the area. This would cause significant adverse impacts to ArcelorMittal Dofasco operations. Therefore, the sediment remediation strategy includes the construction of an ECA to contain dredged sediments on the opposite shoreline from the ArcelorMittal Dofasco shipping dock. This option has many of the advantages of in situ capping (e.g., physical

isolation of sediments) and it is a much more environmentally sustainable approach than excavation and offsite disposal as the material does not need to be dewatered and eventually trucked offsite to a licensed landfill.

The sediment remediation strategy involves dredging sediments containing PAHs greater than 100 µg/g and metals exceeding their respective SELs and placement into an ECA that will be constructed along the eastern shore of the Boat Slip. The ECA is an engineered containment structure that provides for both dewatering and permanent storage of dredged sediments. An appropriately designed and constructed ECA provides long-term effectiveness and permanence in isolating contaminated sediments from the environment. ECAs are being successfully used for dredged sediment disposal throughout the Great Lakes. Onsite ECAs constructed from portions of boat slips are also commonly used for sediment disposal for other AOCs (for example, the Waukegan Harbor AOC and the St. Louis River/Interlake/Duluth Tar AOC) and an ECA is currently being planned as part of the Randle Reef Project. The preferred location and configuration of the ECA (shown in Figure 3) was selected as it is removed from potential impacts to three stormwater outfalls, it minimizes the size of the ECA footprint and potential impacts to aquatic habitat, and it does not impede ArcelorMittal Dofasco's shipping operations. ArcelorMittal Dofasco has two stormwater outfalls: one located in the southwestern corner and one in the southeastern corner of the Boat Slip. The City of Hamilton owns the Kenilworth combined storm sewer outfall (CSO), which is located 470 m from the southern end of the Boat Slip. Due to considerations during construction (for example, physical disturbance and destruction of outfall headwalls), the ECA will be located approximately 86 m from the Kenilworth CSO. Based on the sediment characterization work completed to date, the volume of sediment that is proposed to be dredged (that is, located outside of the capped area and ECA footprint) and placed into the ECA is less than 40,000 m³. This includes the application of a 20 percent contingency allowance to address anticipated uncertainty with field delineations and variations that may be encountered during dredging and verification testing. Based on the estimated volumes of contaminated sediments required to be managed, the production capacity/dimensions of the ECA are 44 m wide by 264 m long. The exact dimensions of the ECA will be refined during the detailed design stage.

After the dredged material has been placed into the ECA, it will be capped to physically isolate it and prevent direct and indirect human and ecological exposure to the contaminated sediments. An engineered cap consisting of sand (20 cm minimum thickness) and gravel (15 cm minimum thickness) will be installed to block the exposure of humans and non-human biota (for example, benthic invertebrates, plants, and birds) to the contaminated sediments (Figure 4). The sand layer will chemically isolate the contaminants, and the gravel layer will prevent bioturbation from disturbing the sand layer. The inside of the ECA will never be developed; therefore, it will not be disturbed. Within the confines of the ECA, the cap will be protected from wind and wave erosion and action. Long-term monitoring (for example, visual surveys) will be conducted to evaluate the integrity of the steel sheet piles and the cap.

The construction of the ECA within the Boat Slip may result in the loss of aquatic habitat. It should be acknowledged however, that few fish have been observed within the Boat Slip and habitat quality is poor due to the elevated concentrations of contaminants in the sediments and as a result of shipping activity and physical habitat disturbance. The Boat Slip remediation project is an enhancement project as it will mitigate exposure of aquatic flora and fauna in the long-term to contaminated sediments through physical isolation within the ECA. Sediment quality and, therefore, aquatic habitat quality will be significantly improved within the Boat Slip area. Through consultation with DFO, measures to compensate for the loss of fish habitat as a result of the ECA construction could be implemented and may include things such as the placement of rock material along the lower portion of the outside bulkhead wall face and along the eastern shoreline of the Boat Slip to improve the quantity and quality of fish habitat over current conditions.

1.4.2 Water Treatment System

A mobile, temporary water treatment system will be set up onsite to treat excess water from the ECA. Treated water will be discharged either back into the Boat Slip or into ArcelorMittal Dofasco's sewer system.

The water treatment system will be permitted provincially, and through the municipality if applicable, through a mobile environmental compliance approval including provisions for the treatment and release of effluent meeting applicable discharge criteria. Excess water in the ECA will be as a result of the dredged sediment slurry and precipitation. Withdrawing water from the ECA will create an inward gradient from the Harbour into the ECA during disposal operations. It is expected that a 50 m³/hour capacity mobile, water treatment system consisting of chemical addition with sedimentation, mixed media filtration, and granular activated carbon will be needed.

1.4.3 In Situ Capping

The most appropriate approach in managing the sediments containing PCBs exceeding 50 µg/g is to minimize the disturbance of these sediments and to encapsulate them in place using a specifically designed, engineered cap. The Boat Slip is as an ideal location to complete in situ capping given that these sediments are located in a hydraulically isolated position at the end of the Boat Slip and are at a relatively deep water depth, thus minimizing the likelihood of erosion from events such as storms, ice scour, and prop wash. Risks to construction workers and other humans from contaminants are not a concern during cap installation as the careful placement of an engineered cap on top of the sediments would leave them relatively undisturbed. The placement of this cap will mitigate exposure to humans, fish and aquatic species and thus provide significant and long-term net environmental benefits. This option is more sustainable than offsite disposal, as the contaminated material does not need to be dredged, mechanically dewatered and trucked offsite for treatment, likely by thermal destruction. There is a significant potential for risks to humans and the aquatic and terrestrial environments from physically removing and managing these hazardous sediments onsite and offsite either from planned events or because of accidents and malfunctions.

Sediment cap design will be undertaken during the detailed design phase; however, it will likely include layers of geotextile, sand, gravel, and larger rock, such as quarry spall. The engineered cap would be intended to provide physical isolation of the contaminated sediment that would be sufficient to reduce exposure due to direct contact, and also reduce the ability of burrowing organisms to move contaminants to the surface (bioturbation). It would be designed to minimize potential erosion of the cap, which will minimize the potential for resuspension and transport of contaminated sediments. Based on the sediment characterization work completed to date, the size of the area containing sediments with PCBs exceeding 50 µg/g that will be covered by an engineered cap is approximately 66 m wide by 120 m long. However, the exact dimensions of the cap would be confirmed during detailed project design. Long-term monitoring of the cap as discussed below would be undertaken to ensure that cap integrity and performance is maintained.

1.4.4 Sediment Dredging

Given the nature of the Project and sediment characteristics, dredging of contaminated sediments is likely going to be completed by mechanical dredging. Mechanical dredging buckets are similar to land-based crane and bucket excavators. The bucket is dropped through the water column and penetrates into the sediment by gravity. The bucket is closed and then lifted from the sediment through the water column. When the bucket is above the water surface, it will be moved to deposit the dredged material into the ECA for disposal.

Mechanical dredges remove sediment at nearly the same in situ density and water content. However, some additional water is typically included because the bucket cannot be filled completely with sediment, and water is captured at the top of the bucket. Mechanical dredges typically include a volume of water equivalent to 20 to 50 percent of the bucket capacity. The production rate of a mechanical dredge can vary from 48 to 190 cubic metres per hour (m³/h), depending on the bucket size, depth of cut, depth of water, and material transport system.

An enclosed environmental bucket will likely be used that has been designed to remove sediment in relatively thin layers and creates a closure seal to reduce sediment loss, which minimizes sediment resuspension during dredging. Enclosed environmental buckets also minimize water loss during retrieval. Some environmental buckets use hydraulic cylinders to close the clamshell, which provides a tighter seal and

further reduces sediment loss. Based on the results of the sediment investigations, the depth of dredging will be into the top of the native clay.

During dredging operations, best environmental management practices (BMPs) will be used to minimize environmental impacts. This will include the installation of barriers prior to dredging, such as silt or bubble curtains, at the northern limit of construction within the Boat Slip to mitigate the migration of suspended sediments offsite and into the Harbour. These practices will also include adaptive monitoring to adjust activities to site specific water and weather conditions. Dredging itself is also expected to be completed from January to March during a relatively, non-sensitive environmental time period.

1.4.5 Post-dredge Residuals Management

After dredging has been completed, a sand cap will be placed over the dredged areas within the Boat Slip. The sand cover will manage post-dredge residual contamination that is present as a result of sediment resuspension during dredging, sediment overlying the clay layer that remains after excavation, and contamination within the clay layer. The cover will consist of a 15- to 20-cm layer of sand, which will prevent exposure of the residual contamination to ecological receptors in the biologically active zone and water column. It will also provide habitat for fish and benthic invertebrates within the Boat Slip.

1.4.6 Long-term Monitoring

A robust, long-term monitoring program will be implemented to monitor the condition of the in situ cap and ECA and that they are operating as designed.

1.4.7 Emissions, Liquid Discharges and Waste Management

1.4.7.1 Atmospheric Emissions

The only sources of atmospheric contaminant emissions anticipated from this Project are from the equipment used during the excavation of sediments and construction of the ECA, as well as from trucks used to mobilize and demobilize equipment and materials to the site. Atmospheric emissions were considered in developing the remedial strategy and are considered to be significantly lower with in situ capping and placement of sediments into the ECA as compared to sediment removal, mechanical dewatering and trucking to an offsite landfill. BMPs will be utilized to minimize atmospheric emissions. These will include a variety of measures including maintenance of vehicles, boats, dredge and equipment in good condition, equipped with air emission controls as applicable, and operated within regulatory requirements, including meeting local authority's emission requirements. Unnecessary idling of vehicles and equipment will be avoided.

With respect to dust, the sediments that will be dredged and relocated will be relatively moist and therefore, will not generate dust to any appreciable amount. ArcelorMittal Dofasco has an extensive road flushing and sweeping program to minimize road dust and to reduce track out. The condition of the roads are monitored throughout the day and cleaning frequency is modified as required. A camera network is also present and will be used to view the work areas to determine the requirement for and performance of dust control operations. Other BMPs will also be implemented to control dust including that workers and equipment operators will be instructed regarding dust control methods, the extent of disturbed areas will be minimized, areas will not be cleared/exposed for extended periods of time, and erosion and sediment control measures will be installed and left in place until the Project is complete and the site has stabilized. As such, it is not anticipated that fugitive dust emissions from Project activities will have likely effects on the environment.

BMPs will also be implemented to mitigate impacts with respect to noise. The measures include conducting work during normal business hours and in accordance with the local noise bylaw, ensuring equipment and vehicles are in good working order, are equipped with proper noise emission controls and that there is no excessive idling/running of vehicles and equipment, monitor and mitigate public complaints by keeping a record of complaints and addressing issues raised by the public should they arise, and the construction work will be completed during the winter which will mitigate impacts to birds and mammals.

1.4.7.2 Liquid Discharges

A mobile, temporary water treatment system will be set up onsite to treat excess water from the ECA prior to discharging the water back into the Boat Slip. The excess water in the ECA comes from the dredged sediment slurry and precipitation. It is expected that a 50-m³/h capacity mobile water treatment system consisting of chemical addition with sedimentation, mixed-media filtration, and granular activated carbon will be needed. The system will be provincially, and municipally if necessary, permitted through a mobile environmental compliance approval, including provisions for the treatment and release of effluent meeting applicable discharge criteria. This water treatment system will discharge water back into the environment that will meet the applicable discharge criteria.

1.4.7.3 Waste Management

The only wastes anticipated to be generated during the proposed sediment remediation Project likely include:

- Typical construction waste, such as packaging used to protect construction materials during shipping, disposable personal protective equipment, and disposable sampling equipment. This material will be managed in accordance with local regulations through ArcelorMittal Dofasco, likely as municipal solid waste.
- Waste generated from the analysis of samples and from the carbon and filter media used to treat the excess water from the ECA. This waste will be managed by the laboratories contracted to complete the analysis in accordance with O. Reg. 347 and local regulations.
- A robust reduce, re-use and recycling program will be implemented for this Project. In addition, ArcelorMittal Dofasco will not only consider waste management options during the design, but will also look at designing the Project with sustainability principles in mind including considerations for sourcing materials that have better environmental footprints, are produced locally, etc.

1.4.8 Overview of Project Schedule

The Boat Slip remediation project is proposed to occur at a time when the impact to terrestrial and aquatic flora and fauna will be minimized as well as over a period of time when there will be minimal interference with shipping operations which could have significant economic impacts to ArcelorMittal Dofasco. There is no shipping traffic within the Boat Slip from the beginning of January to the end of March in any given year and therefore, cap installation and dredging will be completed during that period. The construction of the ECA and installation of the water treatment system will take approximately two months and needs to be completed prior to dredging in January. Based on site conditions and the current proposed scope of work, it is expected that the site preparation and equipment mobilization project phase will take approximately two months to complete as well. Therefore, ArcelorMittal Dofasco is proposing to initiate work/the Project in August 2016 so that dredging can be completed during the winter and, with the exception of monitoring, the Project is expected to be completed by the end of June 2017. Table 1-1 presents a summary of the main activities that will take place during each Project phase.

TABLE 1-1
Main Activities during each Project Phase

Project Phase	Schedule
Site Preparation and Equipment Mobilization Phase/Short-term Time Period <ul style="list-style-type: none"> • Clearing, grubbing, and grading activities, including along eastern shoreline • Modification of roadways to enhance access to the Boat Slip • Service installation • Mobilization of materials and equipment to the Boat Slip 	August and September 2016

TABLE 1-1
Main Activities during each Project Phase

Project Phase	Schedule
Construction Phase/Mid-term Time Period <ul style="list-style-type: none"> • Installation of BMPs and environmental control measures (e.g., bubble or silt curtain in Boat Slip) • Mobilization, installation, and operation of temporary water treatment system • Installation of sheet piling, and construction of the ECA • Cap installation over sediments containing PCBs exceeding 50 µg/g • Dredging outside of ECA footprint and placement of sediments into ECA • Placement of sand cap over dredged areas of Boat Slip • Capping of sediments within the ECA • Demobilization of equipment, and decommissioning of all temporary services and structures, including water treatment system 	October 2016 to June 2017 Note: To minimize impacts to aquatic organisms, the project is aiming to complete the dredging portion of this phase between January and March during a relatively, non-sensitive biological time period
O&M Phase /Long-term Time Period <ul style="list-style-type: none"> • Inspections of the cap and ECA to monitor integrity and function • Water quality monitoring to confirm cap and ECA function 	July 2017 onwards
Decommissioning Phase <ul style="list-style-type: none"> • No plans for decommissioning, as ECA is not proposed to be decommissioned in foreseeable future 	Not applicable

1.5 Federal Involvement

This Project is funded by ArcelorMittal Dofasco, and no federal support is currently being provided. The remediation will be completed within ArcelorMittal Dofasco property. ArcelorMittal Dofasco owns the Boat Slip/waterlot and the lands immediately surrounding it. As such, no part of the Project is anticipated to involve federal lands. It is noted that the HPA (a federal Authority) owns a waterlot 450 m north from the outer limit of dredging within the Boat Slip. It is not anticipated that this Project will have an appreciable effect on Federal Lands however, as dredging and sediment placement is occurring in the southern most portion of the Boat Slip and a barrier will be installed to prevent the migration of sediments to outside of the Boat Slip.

1.5.1 Federal Permits, Licenses, or Other Authorizations

The Federal Minister of the Department of Fisheries and Oceans Canada (DFO) has the legislative responsibility for the administration and enforcement of the *Fisheries Act*. Any proposed works and activities that may alter or damage fish habitat must be reviewed and authorized by the DFO. The Conservation Authorities have agreements with DFO in the evaluation and processing of applications; therefore, they would also have to be consulted. DFO also has requirements under the *Species at Risk Act* for fish species. DFO has been consulted on this Project since 2009. Though the *Fisheries Act* was amended in 2012, it is still expected that DFO will be involved in the EA process and that a Project authorization under the *Fisheries Act* may be required.

Several acts administered by Environment Canada (EC) will apply to the Project, including the *Federal Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulation*, as noted, the *Federal Species at Risk Act*, and the *Migratory Birds Act*.

The Navigable Waters Protection Act (NPA) is an Act of Parliament that authorizes and regulates interferences with the public right of navigation. Transport Canada (TC) administers the NPA through the

NPP. Based on the nature of this Project, the Minister (of Transport) will have to be notified and an approval obtained through the NPP.

1.6 Environmental Effects

1.6.1 Physical and Biological Setting

Hamilton Harbour is a triangular-shaped, deep, freshwater bay located on the western end of Lake Ontario, and has an area of approximately 31 km². The bay is protected from Lake Ontario by a 7-km long baymouth sand bar (Burlington Bar). As indicated, a section of the Burlington Bar has been designated as an ANSI. Dredging and landfilling operations have dramatically changed the natural configuration of the bay. The only remaining natural shoreline in the Harbour is at the western end, as the southern and eastern shorelines consist almost entirely of fill. The Harbour was identified by the IJC (consisting of the governments of Canada and the U.S.) as an AOC in the Great Lakes region. Since 1986, a RAP has been in place for the Hamilton Harbour ecosystem by both the Ontario and Canada governments.

The Burlington Ship Canal (located beneath the Skyway Bridge), cut through the Burlington Bar, provides boat access to the Harbour, which has been developed as a deep water industrial port. The Harbour handles the largest volume of cargo and shipping traffic within the Great Lakes, with cargo including coal and iron ore (for use in the production of steel), salt and sand, grains and soybeans, liquid fertilizer, and petroleum products.

The ArcelorMittal Dofasco-owned property adjacent to the Boat Slip on the western side is generally flat, with a break wall and road; loading and unloading of cargo ships occur from this side of the Boat Slip. Along the eastern side of the Boat Slip, aggregate piles approximately 2 m high run the length of the Boat Slip. Towards the northern edge, some vegetation is present (evergreen trees). The lake level is estimated at approximately 1.8 m below the general site grade. The inferred groundwater flow is north towards the Harbour. The site and adjacent properties are supplied with municipal water. Potable water for the City of Hamilton is supplied via a piped municipal distribution system, which does not draw from groundwater sources.

Species of birds that frequent and nest in the Hamilton Harbour area include various duck species, gulls, herons, terns, cormorants, swans, and geese. The west-end of Lake Ontario, including Hamilton Harbour, is an important local and regional habitat areas for waterfowl; in particular, the Windermere Basin and Cootes Paradise.

The surface water area of the Harbour is approximately 2,150 ha, with an average depth of 13 m and a maximum depth of 26 m. Approximately 17 percent of the Harbour is littoral zone; however, due to environmental stresses, less than 1 percent of this area contains aquatic vegetation.

The Harbour and, in particular, Cootes Paradise are important fish habitats. Historically, significant fish habitat was lost along the southern shoreline with the reclamation of land. Currently, fish habitat is generally restricted to the eastern and western shores of the Harbour and Cootes Paradise. The RAP (Stage 1 Report) states that there is no suitable fish habitat along the southern shore east of the former Lax property (now the Bayfront Park), which includes the Boat Slip. The 1992 RAP (Stage 2 Update) outlines goals to recreate fish habitat and re-establish some key species such as pike, bass, perch and sunfish. Species of fish that are commonly found in the Harbour include bass, pike, perch, carp, alewife, shad, crappies, and catfish. These species could potentially be present within the Boat Slip, however, are likely transient due to the lack of habitat within the Boat Slip due to shipping traffic.

Note that the Project will be completed within ArcelorMittal Dofasco property. ArcelorMittal Dofasco owns the Boat Slip/waterlot and the lands immediately surrounding it. As such, no part of the Project is anticipated to involve federal lands. The nearest Federal Lands are those owned by the HPA located directly to the north of the Boat Slip.

1.6.2 Potential Environmental Impacts

One of the main concerns with respect to potential environmental impacts as a result of the Project, is the suspension of sediment during in-situ capping and dredging. The movement of suspended sediments during these activities could adversely affect aquatic habitats and biota in offsite areas including federal lands. To mitigate offsite impacts, Best Management Practices (BMPs) will be installed and implemented prior to and during the course of these activities. Additionally, monitoring will be completed during these activities to ensure efficiency of dredging operations and BMP effectiveness, and to address the offsite movement of sediment. BMPs will include, but are not limited to, the use of experienced dredging contractors, monitoring of site and weather conditions so that work takes place under favourable conditions, installation of a silt and/or air bubble (pneumatic) curtain, utilization of an environmental bucket, utilization of dredge positioning equipment and software, debris removal prior to dredging, modification of dredging sequence and number of vertical cuts, and utilization of a cutterhead with the least aggressive design necessary to efficiently remove the sediment and use of specially-designed plain suction dredge to minimize residual sediments if using a hydraulic dredge.

Silt curtains and especially air bubble or pneumatic curtains, which will be employed for this Project, have been shown to be very effective in controlling the offsite migration of suspended sediments. Silt curtains are well tested and are proven engineering controls commonly used in the dredging industry. The anticipated percentage of sediments anticipated to be released from the Boat Slip area to the aquatic environment outside of the working area during remedial activities is very minimal. BMPs will include stringing an oil boom across the Boat slip to absorb oil and further protect the aquatic environment.

Once capping and dredging has been completed, a 15- to 20-cm sand cap will be placed over the dredged area to prevent the potential exposure of residual sediment contamination to ecological receptors. This will provide enhanced aquatic habitat for fish and aquatic invertebrates. Furthermore, to compensate for the loss of aquatic habitat, albeit of poor quality, within the Boat Slip due to ECA construction, it is likely that rock material will be placed along the base of the ECA as well as potentially along portions of the eastern Boat Slip shoreline. This will provide new and higher quality aquatic habitat within the Boat Slip.

The Boat Slip and the adjacent lands to the east, south and west are owned by ArcelorMittal Dofasco and as such, no part of the Project is anticipated to involve federal lands. The HPA (a federal Authority) owns the waterlot to the north of the Boat Slip; however, as described above, it is anticipated that this Project will likely not have an effect on Federal Lands. In fact, the goal of the Project is to address sediment contamination in the Boat Slip and in combination with some habitat enhancements, it is expected that the Project will result in positive environmental changes.

As indicated above, no impacts are expected to fish and fish habitat, marine plants or migratory birds. In fact, the goal of the project is to address sediment contamination in the Boat Slip and in combination with some habitat enhancements, it is expected that the Project will result in positive environmental changes.

1.7 Impact on Aboriginal Peoples

As indicated in Section 3.1.5 and shown on Figure 5, the nearest First Nation Community to the site is the Six Nations Indian Reserve no. 40 which is approximately 26km from the site. The site itself and adjacent ArcelorMittal Dofasco lands are not currently used by First Nations and as they are located on reclaimed land, it is unlikely that the project area would have historical, archaeological, or cultural interest to the First Nations. Furthermore, access to the Boat Slip is restricted, and given the conditions present, the Project is not expected to impact Aboriginal Peoples.

1.8 Stakeholder and Aboriginal Engagement

1.8.1 Aboriginal Engagement

To engage Aboriginal Groups during the regulatory review and approvals process, a robust stakeholder engagement plan will be implemented for the Project. Specific items that may be completed to ensure that the Aboriginal Groups have an opportunity to be engaged and consulted on the Project may include:

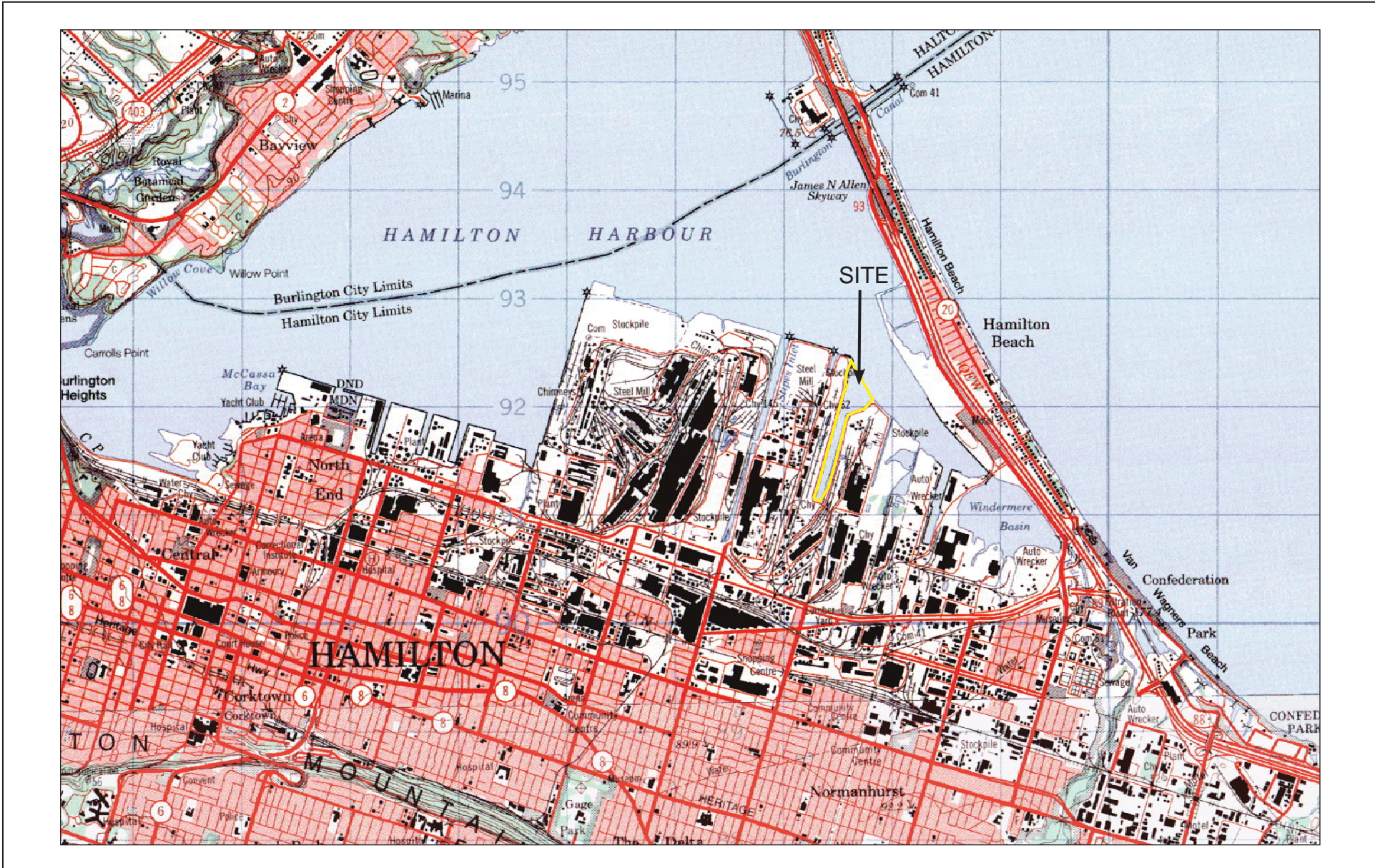
- Sending letters describing the proposed Project to each of the Aboriginal groups identified that may have an interest in the project that include a link to or copy of the project description and offering a description of opportunities on how the Aboriginal groups can become engaged and consulted during the Project.
- Sending information directly to each of the Aboriginal Groups regarding Project consultation activities/presentations and soliciting input/feedback.
- Sending each of the Aboriginal Groups periodic updates on the status of the Project by mail or email.
- Providing links to or sending information on Project document review requirements.

1.8.2 Stakeholder Engagement

As noted under Aboriginal engagement, a stakeholder engagement program will be developed and implemented for the Project. Specific stakeholder engagement activities will include as a minimum continued presentations to the Bay Area Implementation Team (BAIT) on the status of the Project. ArcelorMittal Dofasco will also meet once or twice a year, depending on Project progress, status and interest, with their Community Liaison Committee starting in 2015. Information will be provided on the scope, status, and schedule for the Project.

Depending on the needs and interests of stakeholders, further engagement activities will be planned including a public information session.

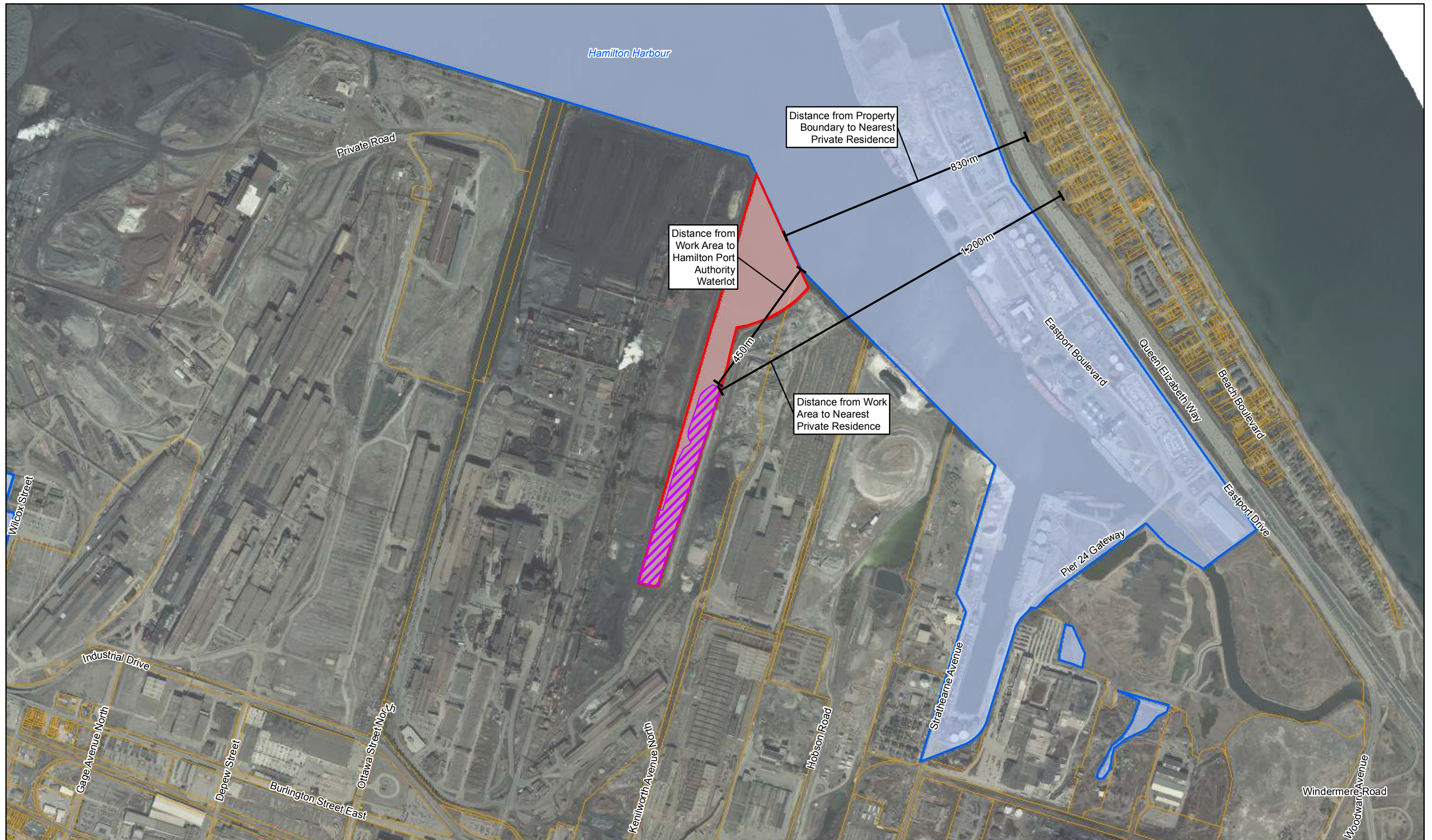
Figures



SOURCE: Produced under licences granted by Her Majesty the Queen in right of Canada, represented by the Department of Natural Resources, and by SoftMap©.

FIGURE 1
SITE LOCATION, HAMILTON HARBOUR

ArcelorMittal Dofasco Inc.,
Boatslip Remediation Project



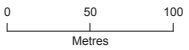
Distance from Work Area to Hamilton Port Authority Waterlot

Distance from Property Boundary to Nearest Private Residence

Distance from Work Area to Nearest Private Residence

Notes:
 1. Aerial Photograph - December 2012 Data set is copyrighted by First Base Solutions Inc. and licensed to CH2M HILL.
 2. Property boundaries source: City of Hamilton.
 3. Hamilton Port Authority Lands take from the Hamilton Port Authority Landuse Plan, Stantec 2002.

Figure 2
 Project Area
 ArcelorMittal Dofasco Boat Slip Remediation Project
 ArcelorMittal Dofasco Inc.
 Hamilton, Ontario

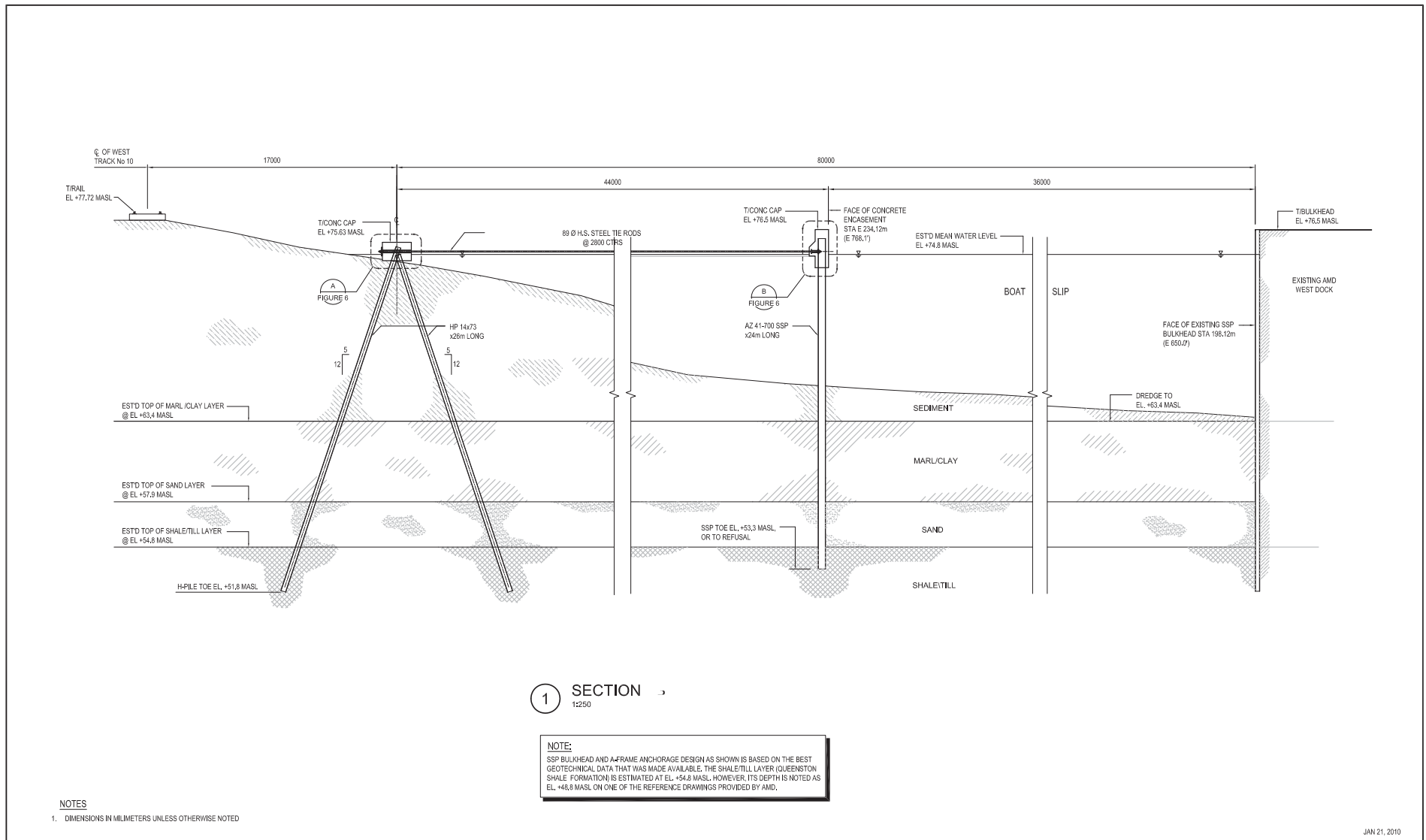


- Sediment Sample Location (2011)
- Sediment Sample Location (2008)
- Sediment Sample Location (2013)
- ▭ Proposed ECA Location 264, x 44m

Notes:
 1. Aerial Photograph - December 2012 Data set is copyrighted by First Base Solutions Inc. and licensed to CH2M HILL.

Figure 3
 Proposed Location and Dimension of ECA

ArcelorMittal Dofasco Inc.
 Boatslip Remediation Project
 Hamilton, Ontario



JAN 21, 2010

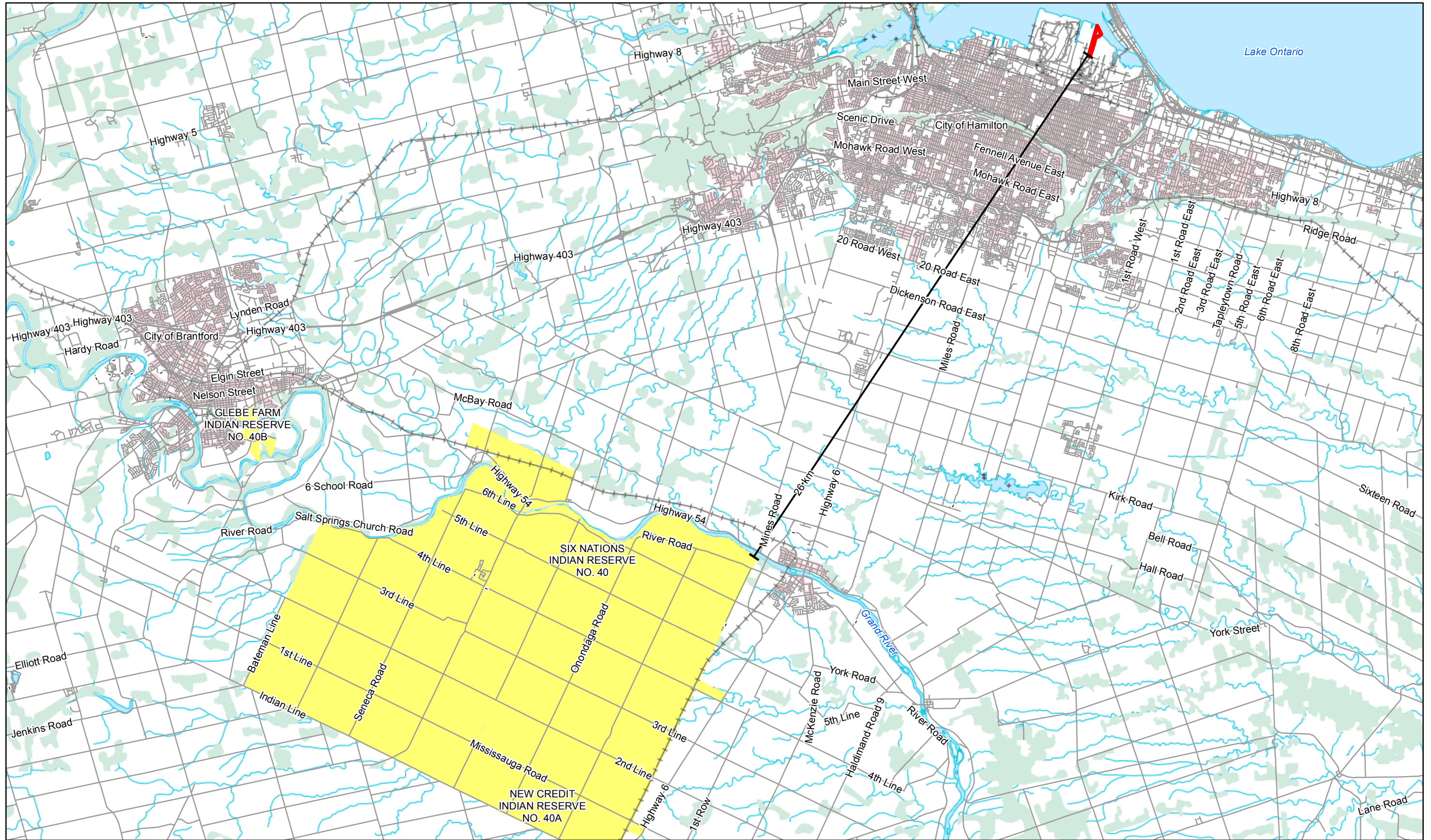
LEGEND

MASL METERS ABOVE SEA LEVEL

- SEDIMENT
- MARL/CLAY
- SAND
- SHALE/TILL

Figure 4
Draft Conceptual Cross Section of ECA

ArcelorMittal Dofasco Inc.
Boat Slip Remediation Project
Hamilton, Ontario



Notes:
 1. Aerial Photograph - December 2012 Data set is copyrighted by First Base Solutions Inc. and licensed to CH2M HILL.
 2. Property boundaries source: City of Hamilton.

Figure 5
 First Nations Land in South / Central Ontario
 ArcelorMittal Dofasco Boat Slip Remediation Project
 ArcelorMittal Dofasco Inc.
 Hamilton, Ontario