Option Study Report

Conveying of Polyhalite from Wilton to Bran Sands

York Potash Limited

March 2015
Final Report
PB1586

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Enhancing Society Together

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1 EXECUTIVE SUMMARY

The York Potash Project requires a conveyor to transfer Polyhalite product from the Material Handling Facility (MHF) at Wilton to the Harbour at Bran Sands. The conveyor would be 3.6km long with multiple horizontal curves to align the conveyor with the existing service corridors leading to the Tees shoreline. The conveyor, being the only operational route between the MHF and the shiploader, must operate reliably and safely 24 hours per day, 7 days per week therefore the operational integrity of the conveyor is of critical importance for the project.

York Potash has identified a potential conveyor corridor with a northern and southern option at the Dabholm Gut area, which provides a contiguous route for a belt conveyor. However, this route has significant existing infrastructure, within it and crossing it, which the conveyor must pass.

Consultations have been held with the owners of this infrastructure and engineering studies have been carried out to assess options for the horizontal and vertical alignment of the conveyor within the corridors identified.

The following conclusions have been drawn:

- With respect to the route:
  - The Southern route is preferred from an operations perspective since it utilises a continuous conveyor alignment with no intermediate transfer towers;
  - Congestion within the services corridor along the Dabholm Gut portion of the Southern route may prevent a feasible construction solution in this area;
  - The Northern route is feasible however, it requires 2 additional intermediate transfer towers and is therefore less desirable from an operations perspective than the Southern route.
- With respect to the vertical aspect of the conveyor system (excluding the crossing of the A1085):
  - An underground tunnel from Wilton to Bran Sands is not considered feasible;
  - The conveyor system should pass over all other facilities and assets except for the power lines, which it must pass beneath.
- With respect to the under and over options for crossing the A1085:
  - The under option would require the conveyor to pass over the top of the adjacent Solid Fuels Depot and Hot Metal Rail and under the A1085 resulting in a complex conveyor curvature which imposes an unacceptable risk to the operation of the Project;
  - The over option is considered feasible and is therefore the only option available.

A number of conveyor options have been developed and assessed for crossing the A1085 and a preferred option selected. This option is included as part of the Development Consent Order application for the York Potash Harbour Facility.

2 INTRODUCTION

This report summarises the design development of the conveyor route between the Material Handling Facility (MHF) at Wilton and the Harbour at Bran Sands and describes the final preferred route. The route selection has developed in a number of steps, generally as follows:

a) Land owners in the general area of the proposed facilities at Wilton and Bran Sands were identified and assessments were made of the intermediate areas, without significant existing facilities, through which a conveyor could be routed;
b) Broad corridors were then identified to provide a contiguous route from the MHF to the Bran Sands area;
c) A number of conveyor options (10) were identified in order to select the preferred route;
d) Major existing facilities and services which cross the corridors were identified and discussions were held with their respective owners to assess the impact of the proposed conveyors during construction and subsequent operations;
e) The final route was selected.
f) Specific requests were made during stakeholder consultation meetings that the following also be considered:
g) The whole conveyor routed below ground in a tunnel from Wilton to Bran Sands; and,
h) Passing the conveyor under the A1085.

Discussion on (f) is included in Section 6 and Appendix 2, and (g) is included in Section 8.

3 OPERATIONAL REQUIREMENTS OF THE CONVEYOR

The conveyor system is part of the Harbour Facility and connects the MHF at Wilton to the ship loading system at Bran Sands. The conveyor system will be located within the Wilton International industrial complex. The landscape character within the site and its immediate environs is dominated by industrial activity, forming part of the Tees Estuary port, industrial and petrochemical complex and is described in detail in the Harbour Facilities DCO application.

The distance from the MHF to Bran Sands is over 3.6 km and the conveyor system, comprising twin, parallel, continuous belt conveyors, will transfer 13 million tonnes per annum of polyhalite when operating at full capacity. This scheme will be developed in two phases. The initial phase will be designed for 6.5 million tonnes per annum of Polyhalite and the second phase will duplicate this for another 6.5 million tonnes per annum.

The port conveyor system is the main operational link between the proposed product storage shed and the ship-loading facility and must operate reliably and safely, at full capacity, under all loading conditions. Harbour operation is 24 hours per day, 7 days per week since ships must be loaded as soon as possible after arriving at the port to avoid shipping delays and consequent demurrage charges.

The conveyor system comprises the following:

- Reclaimer located in the Product Storage Shed at the Wilton site;
- Overland conveyors from the Product Storage Shed to the transfer tower/ surge bin at the Bran Sands site;
- Conveyor tripper running along the shore (parallel with the quay);
- Shiploader.

The operation of the whole system will be controlled automatically from an operator cabin at the shiploader. The reclaimer will be required to start and stop to move between product stockpiles within the shed and the shiploader will be required to start and stop to move between hatches on the ship (up to 18 hatch changes for a 85,000DWT Panamax ship).

A number of investigations and preliminary engineering designs have been carried out in the development of the various options, including:

- Meetings with stakeholders
- Flood risk assessments
- Materials handling calculations
- Berth capacity calculations
- Structural calculations
- 3D laser survey of the proposed route
- Existing ground investigation information

With respect to space requirements, the two conveyors will need to be separated by a maintenance access walkway together with further maintenance access walkways on the outside faces of the conveyors for maintenance access to the outside idler bearings. Clearance is also required over the top of the conveyors to accommodate lifting of components during maintenance operations. There are three 1m wide maintenance walkways and two conveyor belts making a total minimum width of 7.4m and minimum height of around 3.0m.

This is shown in the section of the conveyor profile Figure 1 below.

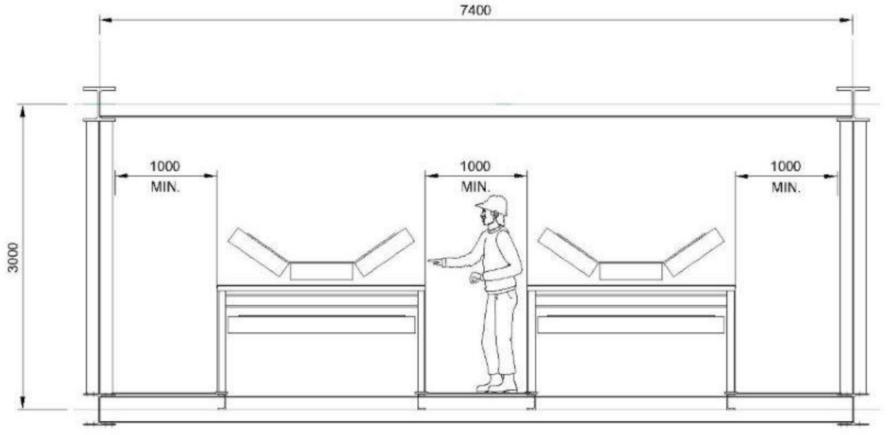


Figure 1 Conveyor clearance requirements

4 CONVEYOR CORRIDOR

4.1 General Route Selection

York Potash requires land for siting of the MTS portal, the MHF (comminution plant, granulation plant, product storage sheds) and Harbour facilities for the Project. Land searches indicated that there was no suitable large site at Tees Port which combined a water frontage of 400-500m (long enough for 2 Panamax berths) with sufficient land for the remainder of the facilities.

York Potash subsequently identified the Wilton International Industrial complex as a suitable site for the Materials Handling Facility based on the following:

- It is a large industrial complex with sufficient unoccupied land available for the MTS portal;
- It is supported by significant existing infrastructure including roads, security, power, water supply, steam, etc;
- It is close to Teesside and has access to established services corridors between the Wilton site and the Tees shoreline.

In addition to the above, Bran Sands was the only river frontage site available and has the following advantages:

- It has sufficient river frontage for construction of 2 Panamax berths;
- It is immediately south (upstream) of the RBT port which is also a bulk material port and has a dredged channel for large ships (directly to the north of the Bran Sands site);
- It adjoins the existing RBT dredged channel;
- There are existing services corridors connecting the Wilton Complex with other infrastructure on the Tees shoreline.

Subsequent to securing options to purchase the Wilton site (for the MHF) and the Bran Sands site (for the Harbour), York Potash held discussions with Sembcorp to identify possible corridors for a conveyor system to connect the MHF with the Harbour. As a result of these discussions, a possible general route was selected along the northern side of the Dabholm Gut. This route is nominated as a services corridor within the Wilton complex for services connecting various third party infrastructure to various port and river crossing infrastructure along the Bran Sands river frontage.

This "Southern Route" provides a reasonably direct route for bulk material handling conveyors between the MHF and the Harbour. Subsequent preliminary engineering design confirmed that a conventional belt conveyor could traverse this route without any intermediate transfer points (which would be required at sharp changes in direction) and was highly desirable from an operations perspective (refer discussion in Section 7.2 below).

The services corridor from the NWL Sewage Works to the Bran Sands river frontage is particularly narrow and contains significant existing third party infrastructure such as above ground pipe racks and raised expansion loops, buried pipelines, surface water drainage systems and access roads. This portion of the route is bounded by the Dabholm Gut on the south side and the NWL Sewage Plant, a former waste tip and the lagoon on the north side.

It was recognised that significant work would be required to confirm the feasibility of locating the conveyor within the service corridor along the Dabholm Gut, therefore a second “Northern Route” was also investigated. This route is identical to the Southern Route from the MHF to the NWL facility, however it runs around the north of the existing NWL Sewage plant and runs along the northern boundary of the facility to the Harbour area.

The corridors where the overland conveyor could be located are shown in Figure 2 (shown green) along with the Northern and Southern Routes. The portion labelled “Wilton End” is common to both the Northern and Southern Routes.

4.2 Conveyor Vertical Alignment Options

The vertical options identified include the following:

- Ground level;
- Below ground;
- Elevated above ground.

These are discussed further in the following sections.

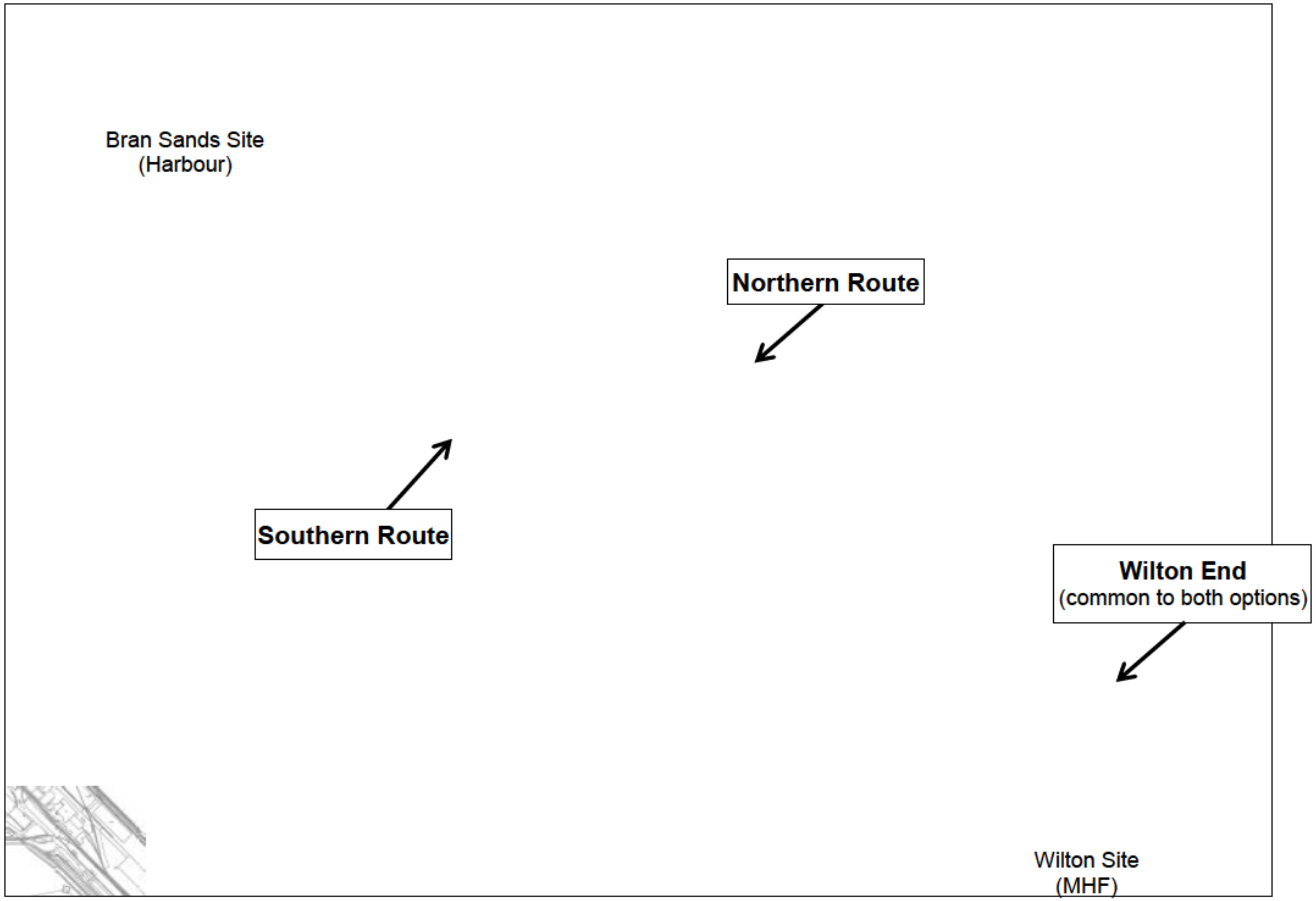


Figure 2.Conveyor Corridors

5 GROUND LEVEL OPTION

5.1 Existing Infrastructure

The simplest route for an overland belt conveyor is following ground level, however, there are significant challenges in the selected corridor areas:

- There are 2 existing elevated roads (A1085 and SSI Road) and 3 existing elevated railways (Hot Metal Rail and SSI Rail and Network Rail) to pass under;
- There are numerous above ground services in the corridor which also occupy the available space under the bridges;
- There are numerous buried pipelines which have strict rules regarding proximity to construction of other infrastructure;
- There are a number of existing access roads and crossings at ground level which cannot be blocked.

The Major Crossings (MCs) and identified stakeholders to liaise with regarding the above and below ground services and associated structures are listed in Table 1 below.

Bridges	Stakeholders
MC1 A1085 Dual Carriage Way	Sembcorp
MC2 Internal Access Road	BP CATS
MC3 Hot Metal Rail	GDF Suez
MC4 Internal Access Road	NWL
MC5 National Power Over Head Lines	SABIC
MC6 SSI Road and Rail	Huntsman Polyurethanes
MC7 Network Rail	RWE
MC8 Northumberland Water Access	Network Rail
MC9 Dabholm Gut Outfall	National Grid
	RCBC
	SSI & Tata
	M&G Fuels
	BDC
	PWC
	Homes & Communities Agency
	Air Products
	Ineos Chlor
	Akzo Nobel
	Ensus
	Northern Gas Networks

Table 1 Summary of third party services and structures

The existing bridge underpasses have no capacity to accept a 10m wide conveyor structure other than within the road spaces which would not be acceptable for operational access to existing infrastructure.

The option to pass the conveyor through the existing embankments was therefore considered as described below.

5.2 Pass Through Existing Road & Rail Embankments

5.2.1 Existing Elevated Infrastructure

Existing infrastructure which is elevated above existing ground level on built up embankments is shown in Table 2, with the height of the top of the embankment above the surrounding ground level as nominated.

MC Number	Description	Height above surrounding ground level
MC1	A1085 dual carriageway	4.0m
MC3	Hot Metal Rail	7.7m
MC6	SSI Road and Rail	6.0m
MC7	Network Rail	2.0-3.0m

Table 2 Existing Elevated Road and Rail Infrastructure

There are 2 basic methods for construction of a tunnel to pass the conveyor, at surrounding ground level, through the embankments beneath the existing roads and railways. These are the “bored tunnel” and “open cut” methods which are described below.

5.2.2 Bored Tunnel

Bored tunnels have been used beneath existing roads and other infrastructure (such as railways), however, this method requires competent and known existing embankment foundation conditions and also at least 3m of clearance between the top of the tunnel and the existing road/rail surface. If these conditions cannot be met, there is a risk of subsidence and failure of the supported road/ rail.

The height of the conveyor tunnel is 3m as shown in Figure 1, and, with the height of the roads and railways above surrounding ground levels as shown in table 2 above, the bored tunnel construction method would only be possible with the MC3 and MC6 crossings. There is insufficient cover above the conveyor tunnel to use this method for the MC1 (A1085) or the MC7 (Network Rail) crossings.

5.2.3 Open Cut

The open cut method would require the removal of a section of road and/or rail, insertion of a box culvert, backfilling and reinstatement of the road and/or rail.

Whilst techniques are available that would enable a box to be slid in under the existing road and rail bridges, these would cause speed restrictions during construction. Such under track solutions are not preferred by Network Rail, whose preference is for third party bridges to be over line rather than under line.

The open cut method would require 3-6 months to construct depending on the final designs adopted and would require extended shut downs of the relevant infrastructure.

5.2.4 Conclusion

Consultation with Network Rail and SSI has confirmed that only night closures are acceptable for their respective facilities, therefore extended closures required for the open cut option would not be possible at these crossings (MC6 and MC7). Since MC7 has insufficient cover for a bored tunnel, the conveyor will have to pass over the top of this railway.

Since MC6 and MC7 are very close together, it would not be possible to pass over the top of MC7 and under MC6, therefore the conveyor must also pass over the top of MC6.

MC1 has insufficient cover for a bored tunnel, therefore construction of the conveyor through the A1085 embankment would require an open cut construction method which would require extensive road diversions. Refer to further discussion on conveyor crossing of MC1 in section 8.

MC3 (Hot Metal Rail) may have sufficient cover to allow construction using a bored tunnel, however, a significant amount of ground investigation and negotiation with the asset owner would be required to establish the feasibility of this option.

5.3 Other Constraints at Ground Level

Other constraints at ground level are:

- The presence of buried services including large diameter gas mains that require 5m easements with safe methods of working and therefore there is insufficient space to accommodate the conveyor.
- Protection from flooding and loss of flooded volume in the order of 75,000m3. This would therefore increase the flood zone beyond the current extents (refer section 7.3.8 Flooding).
- The conveyor would cross existing access roads and preclude inspection and maintenance access by existing infrastructure owners to their facilities.
- Between the Network Rail infrastructure and SSI Road there is a water course known as The Fleet. It is not possible to route the conveyor at ground level without cutting through this water course.

5.4 Conclusion for Ground Level Conveyor Option

The option of routing the conveyor from Wilton to Bran Sands at ground level and through the embankments of existing elevated roads and railways is not considered to be feasible for the following reasons:

- There is no identified clear direct route at ground level between the Wilton site and Bran Sands;
- A ground level conveyor would clash with numerous existing ground level piperacks;
- Owners of existing railways (Hot Metal Rail, Network Rail and SSI Rail) have a strong preference for over rail crossings;

- Ground level conveyors will block existing ground level access ways and roads which could not be relocated.

6 BELOW GROUND OPTION

York Potash also considered a below ground option to transfer product to the Harbour area. This option is described in detail in Appendix 2 and is not considered feasible due to the following:

- Lack of the required space at the Bran Sands end for a tunnel portal;
- Presence of contaminated material throughout the area;
- Flood risk;
- Spoil and contaminated spoil disposal requirements.

7 ELEVATED CONVEYOR OPTIONS

7.1 Options Considered

Ten elevated conveyor options (i.e. elevated above existing infrastructure) were identified and these are described in Appendix 1. These include combinations of the following:

- Northern and Southern Routes:
- Conveyor type: conventional belt conveyors, pipe conveyors and combination pipe/belt conveyors.

This section describes the 2 conveyor types considered, and assesses each of the crossing areas.

7.2 Conveyor Types

7.2.1 Belt Conveyors

Belt conveyors are industry standard for the transfer of bulk materials over distances of several kilometres. These conveyors utilise standard components and can have horizontal and vertical curves. The major operational risk for a curved conveyor is belt mistracking which would result in the following:

- Belt damage
- Spillage
- Product damage
- Dust generation
- Loss of export capacity

In order to minimise these risks for the operation, the design of the conveyor route should be as direct as possible with a minimum number of curves and without complex curves (i.e. combined vertical and horizontal curves).

Transfer towers, which introduce additional sources of operational complexity, maintenance and potential spillage and dust generation, should be minimised.

7.2.2 Pipe Conveyors

Pipe conveyors are capable of tighter horizontal curves than belt conveyors; however, these introduce significant additional complexity. They also require higher power costs and are more difficult to maintain than conventional belt conveyors, they are therefore not preferred.

7.3 Significant Constraints within the Conveyor Corridor

7.3.1 General

Both the proposed Southern and Northern conveyor routes cross significant third party infrastructure and are situated within known flood areas. The vertical alignment of the conveyor has therefore been examined with reference to the specific requirements and constraints in each area as discussed below.

7.3.2 Hot Metal Rail Bridge (MC3)

The conveyor starts at the first transfer tower on Boundary Road East (at the MHF) and must curve to meet the straight conveyor section to the west of the Hot Metal Rail – refer Figure 3 below. The application of the required horizontal curve radius (calculated to be 850m for this curve) means that the conveyor must cross the Hot Metal Rail (referred to as MC3) directly above the existing Breagh Gas Pipeline as shown in Figure 4. The MC3 crossing location cannot change materially since the conveyor is located as close to the north and east red line boundaries as possible, and a tighter or smaller radius cannot be used due to the tension in the conveyor at this location.

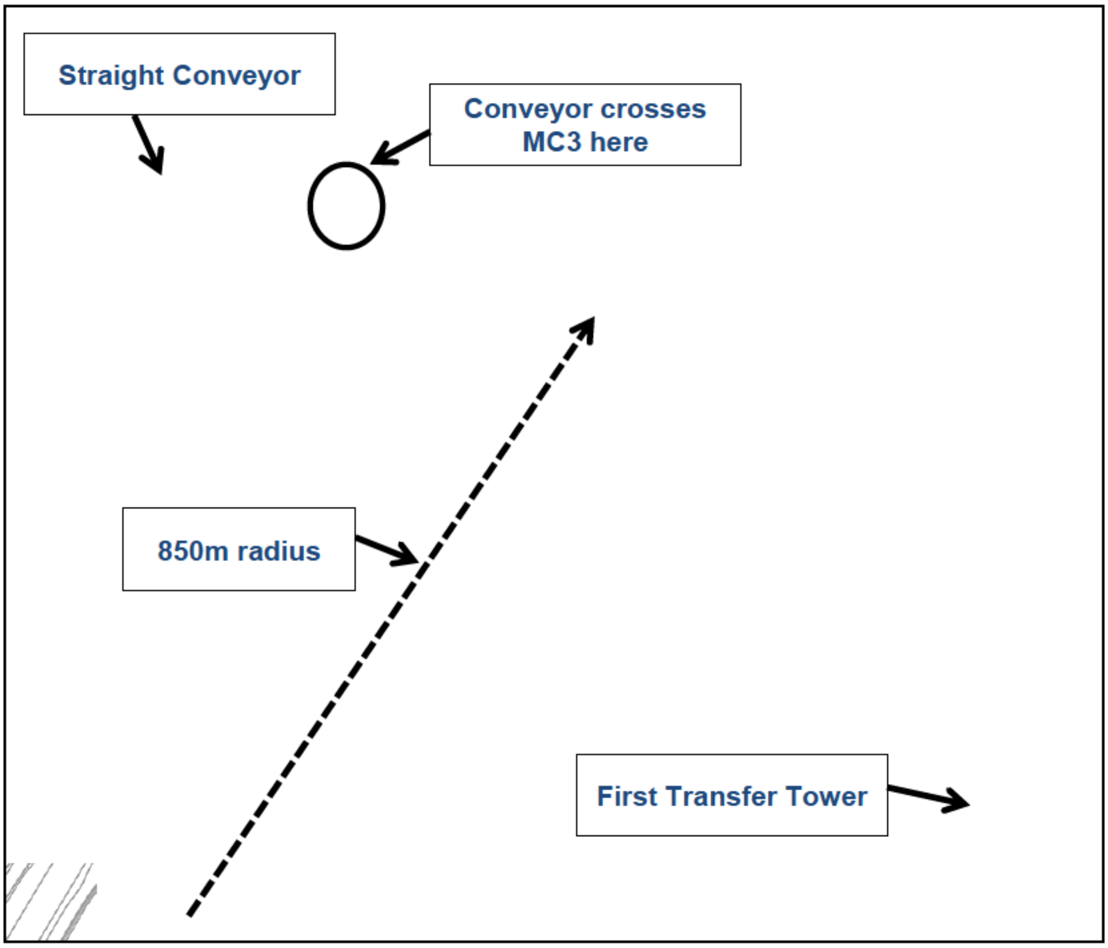


Figure 3 Conveyor Radius

Figure 4 shows the route of the Breagh Pipeline which runs beneath the Hot Metal Rail Bridge through the existing road underpass area. The Pipeline operator's exclusion zone around the pipeline is 2.5m either side of the pipe centre line which would prevent the construction of a conveyor at ground level through this underpass since it would pose too high a risk during the construction phase and would prevent the pipeline operator from inspection or repair of the pipeline during the operation phase.

Given that the conveyor cannot be routed through the Hot Metal Rail embankment as discussed above, it must therefore run above the Hot Metal Rail. A height clearance of 6m has been allowed from the rail to the bottom of the conveyor bridge to ensure safe clearance for rail locomotives and hot metal tankers. This would place the underside of the conveyor bridge about 14m above ground level in this location.

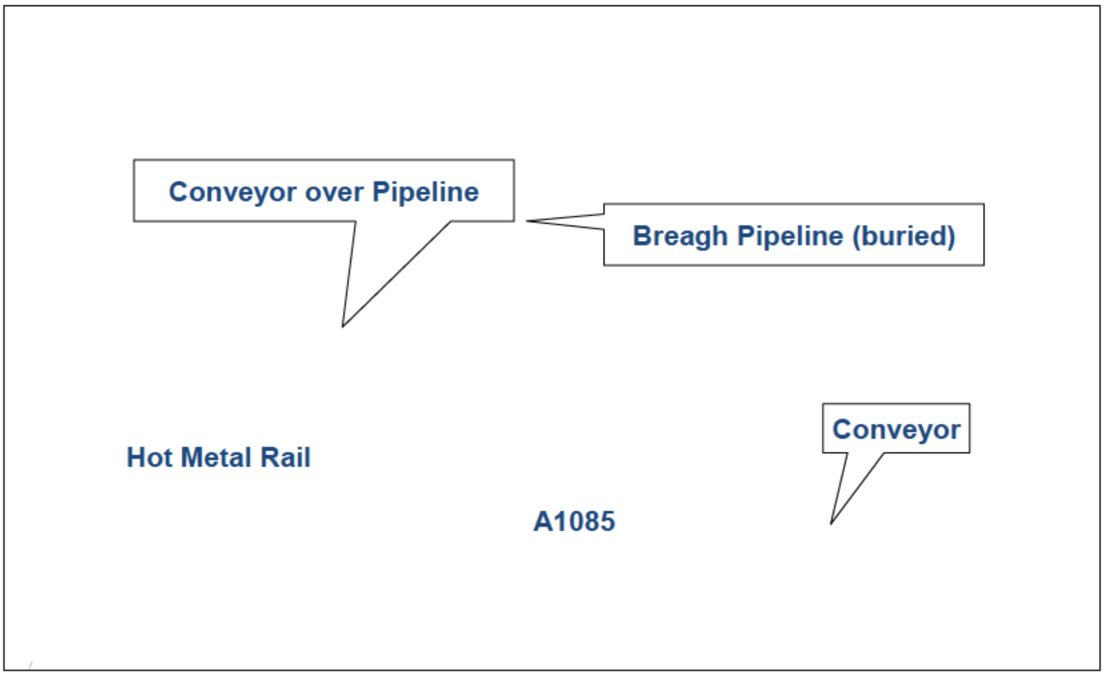


Figure 4 Hot Metal Rail Bridge/ Conveyor Crossing

7.3.3 Surface Mounted Services & Associated Structures

There are numerous ground level services, pipe gantries and expansion loops along the whole of the route referred to as link lines. Associated with these link lines are clearance zones and access ways which must not be obstructed because of easements for operation and maintenance of these assets.

The conveyor must cross over the top of these services at a suitable height to allow the asset owners to retain maintenance, operational and inspection access to their respective assets, therefore a low level conveyor is not considered feasible in these areas.

7.3.4 Buried Services

Easements for buried services, link line routes and local safety zones are shown on the drawings in the Appendix 4. These services include five gas mains, some of which are of national importance, HV cables, fibre optic cables and drainage systems. These easements are up to 5m wide and construction within them would not be permitted.

It would not be practical to remove or relocate any of these existing buried services, therefore the conveyor must pass at least 6m above the ground level in the vicinity of the conveyor crossings.

7.3.5 Other Road and Rail Crossings

In addition to the A1085 and the Hot Metal Rail, there are a number of other significant roads and railways to be crossed. These are:

- MC2 - Internal Access Road
- MC4 - Internal Access Road
- MC6 - SSI Road and Rail
- MC7 - Network Rail

The MC6 and MC7 crossings are discussed in detail in section 5.2 where it was concluded that the conveyor must pass over the top of MC6 and MC7.

Both MC2 and MC4 (internal roads) are located at ground level, therefore the conveyor must pass at least 6m above these (required by Sembcorp across the whole of the Wilton site) in order to maintain access in these areas. The alternative of sinking the conveyor beneath ground level in these locations would not be possible due to the close proximity of below ground and on ground pipework and the long slope distances required by the belt conveyor to descend underground and ascend back up to ground level.

The conveyor must therefore pass over the top of these road and rail assets.

7.3.6 Overhead Line Crossing (MC5)

The overhead lines at MC5 are around 25m above ground level. An image taken from the 3D laser survey looking back to MC5 from Dabholm Gut is shown in Figure 5 below.

Figure 5 Image from 3D Laser Survey looking at the Overhead Lines from Dabholm Gut

Consultation with the owners of the power lines has established that the conveyor must be at least 8m clear of the underside of the power cables, therefore this constraint has been used in the conveyor route design.

7.3.7 Solid Fuels Depot

The Solid Fuels Depot is located at Wilton on land owned by a third party necessitating the need to avoid construction within this area. Permission has been granted in principal to pass the conveyor above the corner of the Solid Fuels Depot providing it does not restrict access to the site. Since the conveyor would cross the existing entrance to the site, a 6m clearance to the road would be required to allow safe operation of vehicles beneath the conveyor bridge.

7.3.8 Flooding

The Environment Agency flood risk map shows that the majority of the site is in flood zone 3, with some in flood zones 1 and 2 with respect to fluvial and tidal flooding - refer figure 6. Flooding risk due to surface water is shown in figure 7.

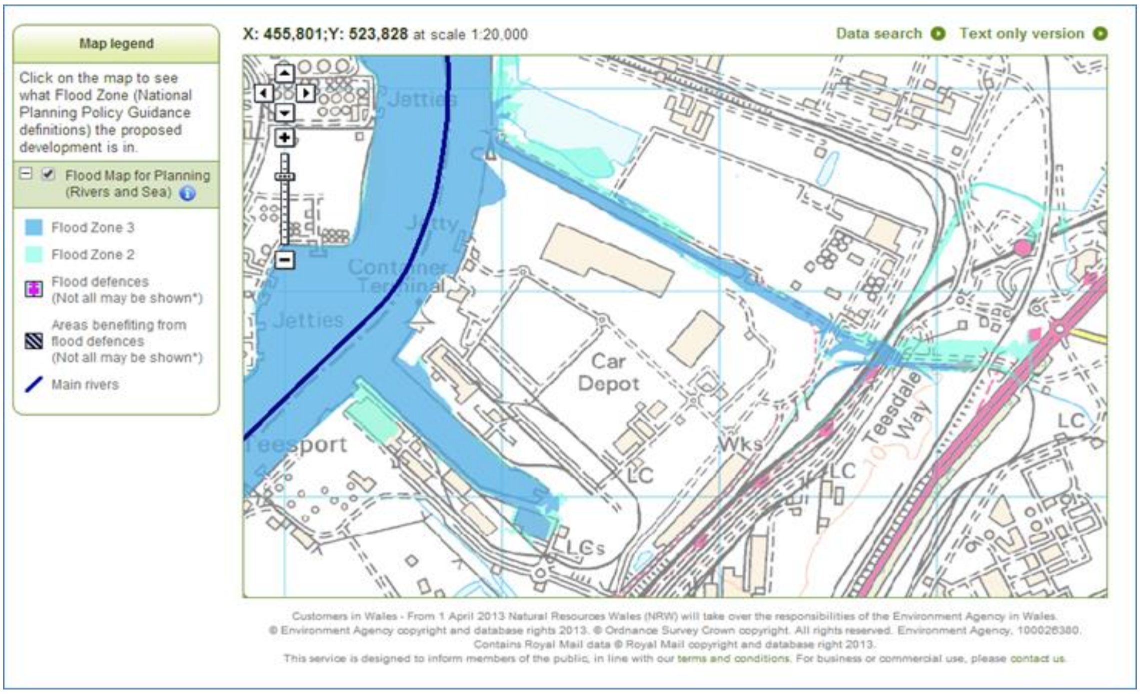


Figure 6 Environment Agency Flood Zones

Figure 7 Surface Water Flooding

It is clear that the areas of flooding which impact the proposed conveyor route (both the Southern and Northern routes) are around the Lord McGowan bridge and the Hot Metal Rail bridge.

Guidance on construction in flood zones is given in:

- National Planning Policy Framework (2012) and;
- Planning Practice Guidance: Flood Risk and Coastal Change (2014).

The design flood level for the scheme for a 50 year design life is +5.25m OD which is around 1.75m above existing ground level along the access road to Bran Sands. Due to the criticality of the conveyor for the York Potash operations, it would need to be either located above the flood level (i.e. above +5.25m OD) or, if located below this level, protected from flooding by suitable flood defence walls if extensive damage and shut downs are to be avoided.

Figure 8 is an extract of the current conveyor route and shows the +5.25m OD flood level between the Lord McGowan Bridge and the Hot Metal Rail (dotted red line). The proposed elevated conveyor would be located within the conveyor envelope (coloured red). The height of the conveyor in this area is determined by the minimum clearance of 6m above the Hot Metal Rail as required by Tata SSI.

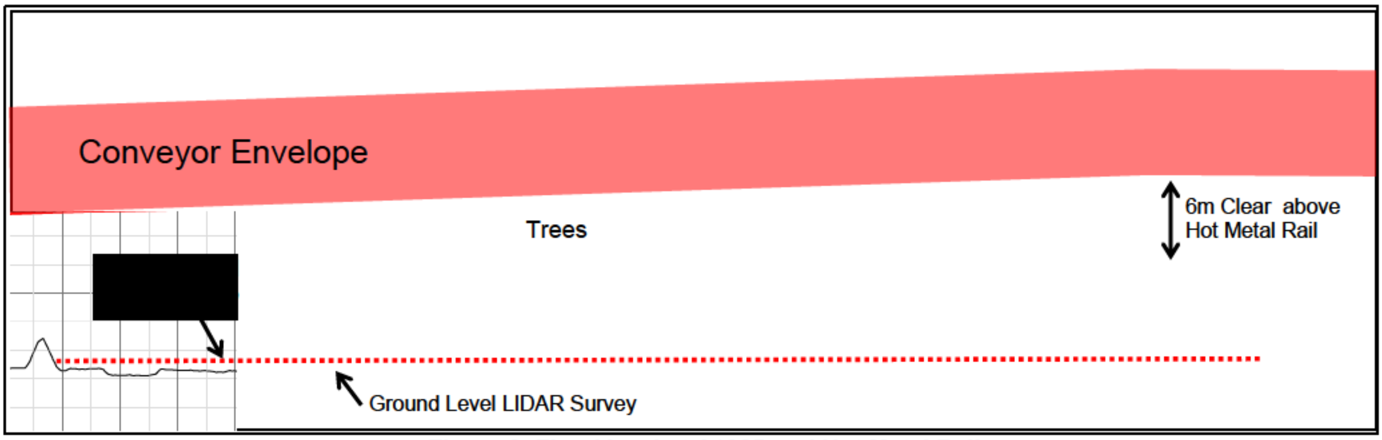


Figure 8 Flood level at A1085 and Hot Metal Rail

8 A1085 ROAD CROSSING

8.1 Crossing Location

As described in section 7.3.2 and shown in Figure 3, application of the minimum design radius of 850m to the conveyor curve in the location of the A1085 means that the conveyor must cross the A1085 about midway between the Lord McGowan Bridge (shown in Figure 9) and the A1085 roundabout to the north of the bridge. In this location, the existing road surface (+7.4m OD) is around 4m above local ground level (+3.4m OD).

The A1085 crossing location cannot change materially since the conveyor is located as close to the north and east red line boundaries as possible, and a tighter or smaller radius cannot be used due to the tension in the conveyor at this location.

The A1085 crossing is between the Hot Metal Rail (to the west) and the third party Solid Fuels Depot (to the east). The conveyor must pass above both of these assets as discussed above in Sections 7.3.2 (Hot Metal Rail) and 7.3.7 (Solid Fuels Depot). The preferred option is for the conveyor to pass over the A1085 in this location..

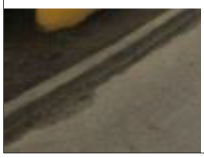


Figure 9 Lord McGowan Road Bridge on the A1085

8.2 Conveyor Underpass

A number of methods were considered for construction of a conveyor underpass through the A1085 embankment. As discussed in section 5.2, there is insufficient cover above the underpass roof level to use a bored tunnel, therefore it would be necessary to construct using an open cut method. This would require closure of the A1085 for a period of 3-6 months to carry out the works during which time traffic would need to be diverted. The transport assessment for the Mine, MTS and MHF Environmental Application indicates that the average 24 hour traffic flow on the A1085 (projected to 2015) would be 19,478 vehicles.

Whilst a detailed traffic study has not been carried out to evaluate the impact of a conveyor underpass, a closure of the A1085 in this location for 3-6 months would be likely to produce significant disruption to local traffic. This would require extensive additional study and consultation before it could be considered to be a viable option compared to passing the conveyor over the top of the A1085 with a conveyor bridge, which would only require a single one day disruption to the A1085 whilst the bridge is lifted into place.

Since the flood level is +5.25m OD (refer Figure 8), a conveyor underpass would be at risk of flooding during either a fluvial event (from the Tees) or surface flooding event (rain water run-off upstream). This would therefore require the conveyor to be located behind a flood exclusion wall to prevent damage to the conveyor and allow the export operation to continue if there was a flood event.

The above requirement would have the following implications for the conveyor:

- Restricted access for maintenance personnel and equipment;
- Installation of sumps and pumps to remove rainwater from the conveyor area;

- Relocation of any services which may run within the embankment along the A1085.

In addition to the above, the construction of flood exclusion walls around the conveyor would interfere with the hydrology in this area making the flood risk at the Lord McGowan Bridge and upstream worse than it currently is.

8.3 Impact of Underpass on Conveyor Alignment

The conveyor would pass above the Hot Metal Rail on the north side of the A1085, and must also pass above the third party infrastructure (roads, pipe racks and Solid Fuels Depot) on the south side. The conveyor route in this area requires a 850m horizontal curve to align the conveyor with the services corridor through the SSI/ Network rail assets.

The option of routing the conveyor under the A1085 would therefore require the following, starting from the Wilton site:

- Rising conveyor to 6.5m (underside of conveyor bridge structure) to get over the piperacks, internal roads and Solid Fuels Depot;
- Elevated, horizontal curve to change alignment towards the Bran Sands services corridor;
- Vertical down curve, imposed on the horizontal curve, to drop the conveyor under the A1085;
- Vertical up curve, also imposed on the horizontal curve, to raise the conveyor to clear the Hot Metal Rail;
- From this point the conveyor would need to remain elevated to clear the services and roads between the Hot Metal Rail and the Bran Sands harbour area.

As discussed in section 3, the export operation requires the conveyor to be operated and maintained to a high level of reliability in order to meet the Project's export capacity. The complexity of the above geometry will impose unacceptable risk on the safe and reliable operation of the conveyor over the long term life of the Project.

In addition to the above, the ground level conveyor would block off the proposed construction access road from the A1085 round about and adversely impact the hydrology in the area.

8.4 Preferred Option

The underpass option described above is not considered feasible for the following reasons:

- Risk of significant adverse impacts on the operational performance and capacity of the conveyor system;
- The inclusion of flood barriers around the conveyor would result in restricted maintenance access and adversely affect hydrology in the area;
- Relatively long closure of the A1085 would be required;
- The conveyor would block all construction and operations access from the A1085 roundabout into the site.

The option of passing over the A1085 is therefore considered to be the only feasible option.

8.5 Overpass

The design of a conveyor overpass has been assessed in significant detail as part of the Environmental Assessment for the Harbour. Various architectural options have been proposed which would not compromise the operational integrity of the conveyors.

Several options for the design of the conveyor over the A1085 have been developed and considered in relation to the impact of their appearance on the locality. These options are described in Appendix 3 and the preferred options, which have been incorporated in the application to PINS for a Harbour Facility Development Consent Order are identified.

A covered conveyor is proposed, incorporating modern materials and an animated façade with openings to allow lighting and operation-related interest will add to the visual interest of this heavily industrialised location. Final details of the bridge elevation treatment and application of other architectural 'devices' will be agreed with Redcar and Cleveland Borough Council as the design development progresses.

9 CONCLUSIONS

The following conclusions are drawn:

- With respect to the route:
  - The Southern route is preferred from an operations perspective since it utilises a continuous conveyor alignment with no intermediate transfer towers;
  - Congestion within the services corridor along the Dabholm Gut portion of the Southern route may prevent a feasible construction solution in this area;
  - The Northern route is feasible however, it requires 2 additional intermediate transfer towers and is therefore less desirable from an operations perspective than the Southern route.
- With respect to the vertical aspect of the conveyor system (excluding the crossing of the A1085):
  - The conveyor system must pass over all other facilities and assets except for the power lines, which it must pass beneath.
- With respect to the under and over options for crossing the A1085:
  - The under option is not considered feasible;
  - The over option is considered feasible and is therefore the only option available.

With respect to the over bridge conveyor options, these have been developed with the visual effect on the locality in mind and the need to maintain operational integrity. High quality design approaches to the delivery of the conveyor over the A1085, using modern materials with architectural devices to add interest have been proposed with final design to be agreed with R&CBC.

APPENDIX 1
HORIZONTAL ABOVE GROUND ROUTE OPTIONS

A total of 10 horizontal, above ground routes were considered for the alignment of the overland conveyor. The route options and the relative position of the conveyor to the Major Crossings are summarised in Table A1.1 below. The table shows:

- Conveyor type (pipe and belt conveyors);
- Route (Nothern route and Southern route);

The factors that were considered in evaluating the different options were as follows:

- Visual impact
- Buried services
- Above ground services and support structures
- Above ground road and rail bridges and embankments
- Overhead lines
- Engineering properties of the ground
- Contamination
- Safe constructability
- Mechanical handling design
- Operation and maintenance

The envelope of these routes is shown in Figure A1.10. They include routes to the Northern and Southern boundaries of the conveyor envelope as well as more central routes. Potential routes outside of the identified envelope (shown green) were also considered and discussed with landowners in the vicinity of the conveyor route, including a direct route (without transfer towers) from the Wilton site to the Northern Route. These routes were discounted due to landowners claims that this land is strategic to their own expansion plans.

The options are shown in figures A1.1 to A1.10 below.

Constraints and Existing Infrastructure	Conveyor routing options									
	I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**
Conveyor Type	**Pipe + Belt**	**Pipe**	**Pipe + Belt**	**Pipe + Belt**	**Pipe**	**Pipe + Belt**	**Belt**	**Belt**	**Belt**	**Belt**
Route	**South**	**South**	**North**	**North**	**South**	**North**	**South**	**North**	**South**	**South**
Rail/road along N and E of Wilton site	Pass over	Pass over	Pass over	Pass over	Pass over	Pass over	Pass over	Pass over	Pass over	Pass over
Roads between YPL Site and A1085	Pass over	Pass over	Pass over	Pass over	Pass over	Pass over	Pass over	Pass over	Pass over	Pass over
M&G Solid Fuels Plot	Pass west	Pass west	Pass west	Pass west	Pass east	Pass east	Pass east	Pass east	Pass west	Pass west
Highway A1085	Pass under	Pass under 50m tunnel	Pass under	Pass under 50m tunnel	Pass over in bridge	Pass over in bridge	Pass over in bridge	Pass over in bridge	Pass over in bridge	Pass over in bridge
YPL 1st access road	N/A	Pass over	N/A	Pass over	Pass over			Pass over	Pass over	Pass over
Hot Metal Rail	Pass under	Pass under	Pass under	Pass under	Pass over	Pass over	Pass over	Pass over	Pass over	Pass over
YPL 2nd access road	N/A	Pass under	N/A	Pass under	Pass over					
National Power Grid lines	N/A	N/A	N/A	N/A	Pass under 10 m clearance	Pass under 10 m clearance	Pass under 10 m clearance	Pass under 10 m clearance	Pass under 10 m clearance	Pass under 10 m clearance
SSI Road Bridge	Pass under	Pass under 300m tunnel	Pass under	Pass under 220m tunnel	Pass over in bridge	Pass over in bridge	Pass over in bridge	Pass over in bridge	Pass over in bridge	Pass over in bridge
National Railway	Pass under	Pass under 300m tunnel	Pass under	Pass under 220m tunnel	Pass over in bridge	Pass over in bridge	Pass over in bridge	Pass over in bridge	Pass over in bridge	Pass over in bridge
Access NWL water treatment plant	Pass under	Pass under	N/A	N/A	Pass over	N/A	Pass over	N/A	Pass over	Pass over
NWL water sewerage plant	Pass south	Pass south	Pass east / north	Pass east / north 50m tunnel	Pass south	Pass east / north	Pass south	Pass east / north	Pass south	Pass south
Road junction at outfall	Pass over	Pass over			Pass over		Pass over			
Position of surge bins	South	South	Central	Central	South	Central	South	Central	South	South
Total length of conveying line	3,630 m	3,605 m	4,405 m	4,345 m	3,835 m	4,555 m	3,800 m	4,590 m	3,550 m	3,500 m
Conventional conveyors	615 m	0 m	3,425 m	2,770 m	145 m	2,890 m	3,800 m	4,590 m	3,550 m	3,500 m
Pipe conveyors	3,015 m	3,605 m	980 m	1,575 m	3,690 m	1,665 m	0 m	0 m	0 m	0 m
Number of transfer towers	2	0	4	2	0	2	0	3	0	0
Maximum level of conveying line	10 m	20 m	10 m	20 m	20 m	20 m	20 m	10 m	20 m	20 m

Table A1.1 Above Ground Options

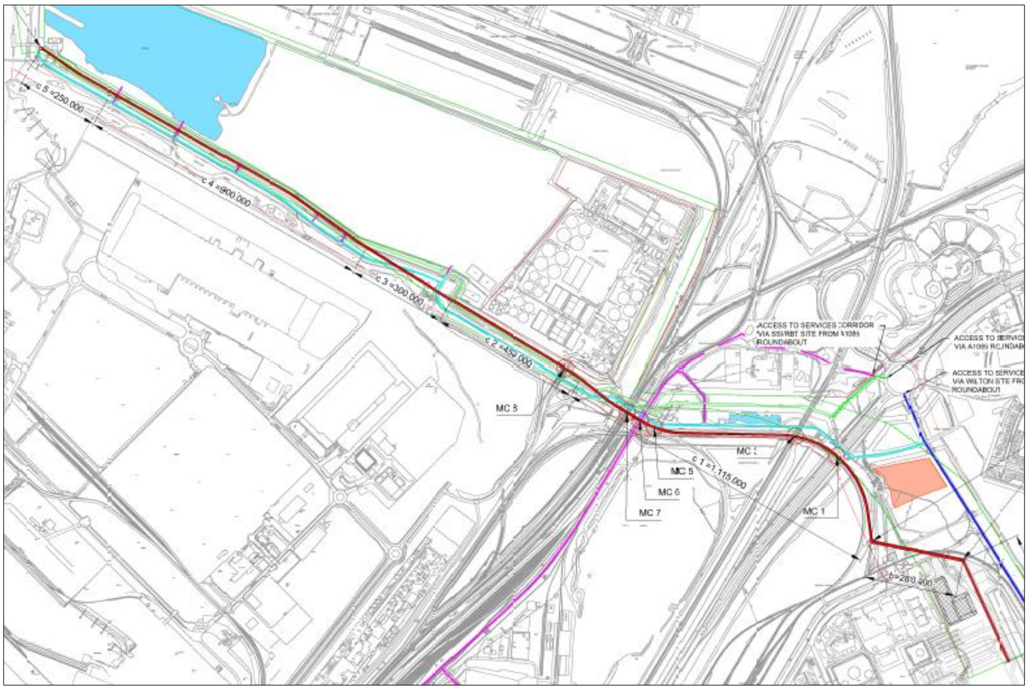


Figure A1.1 - Option I

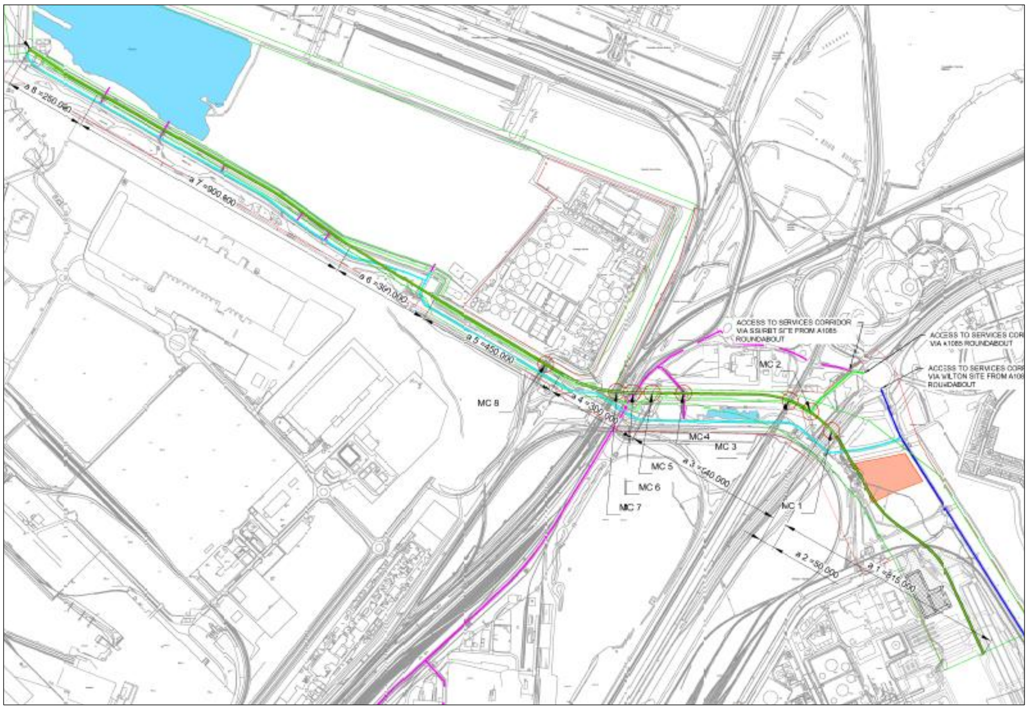


Figure A1.2 - Option II

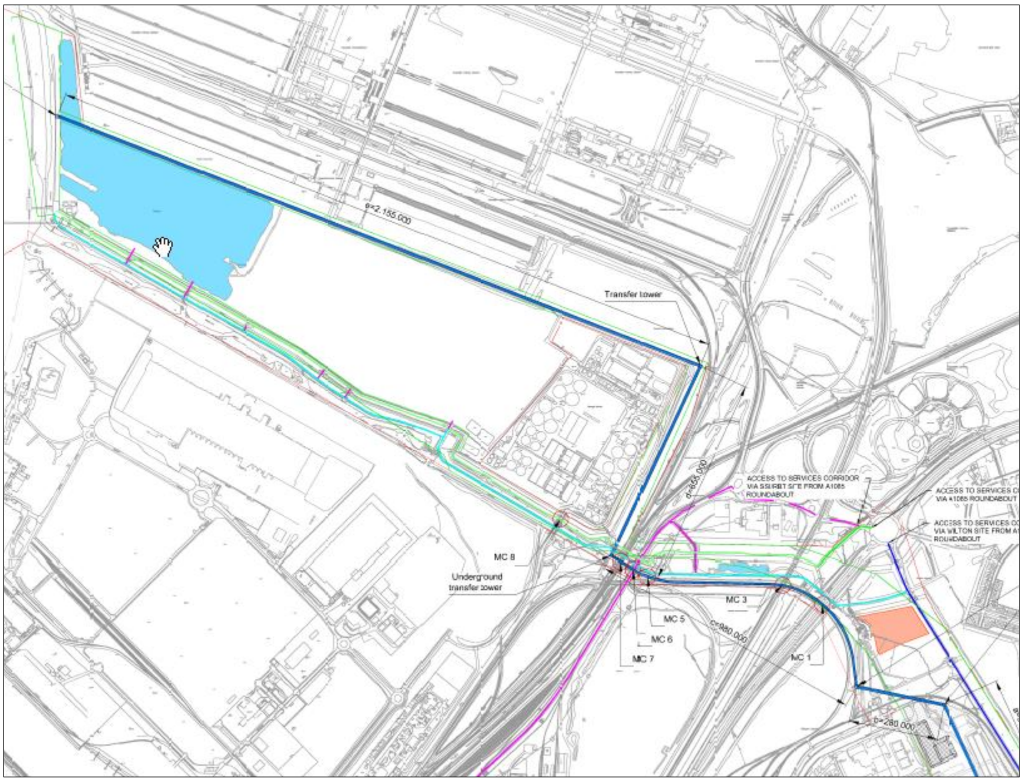


Figure A1.3 - Option III

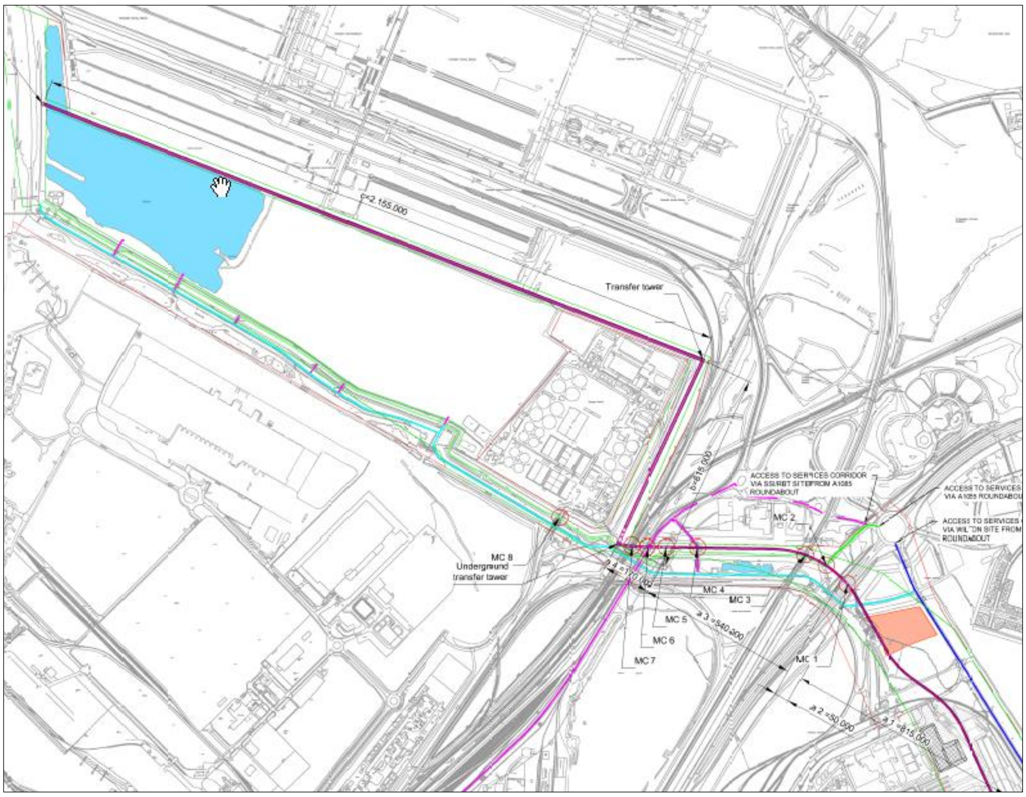


Figure A1.4 - Option IV

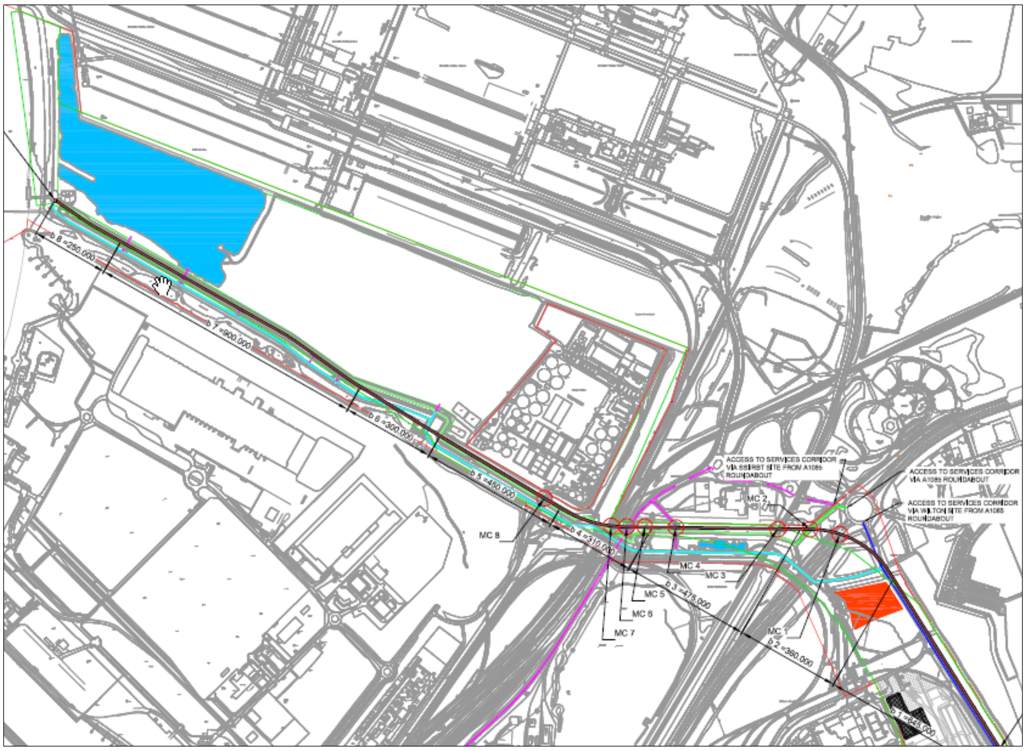


Figure A1.5 - Option V

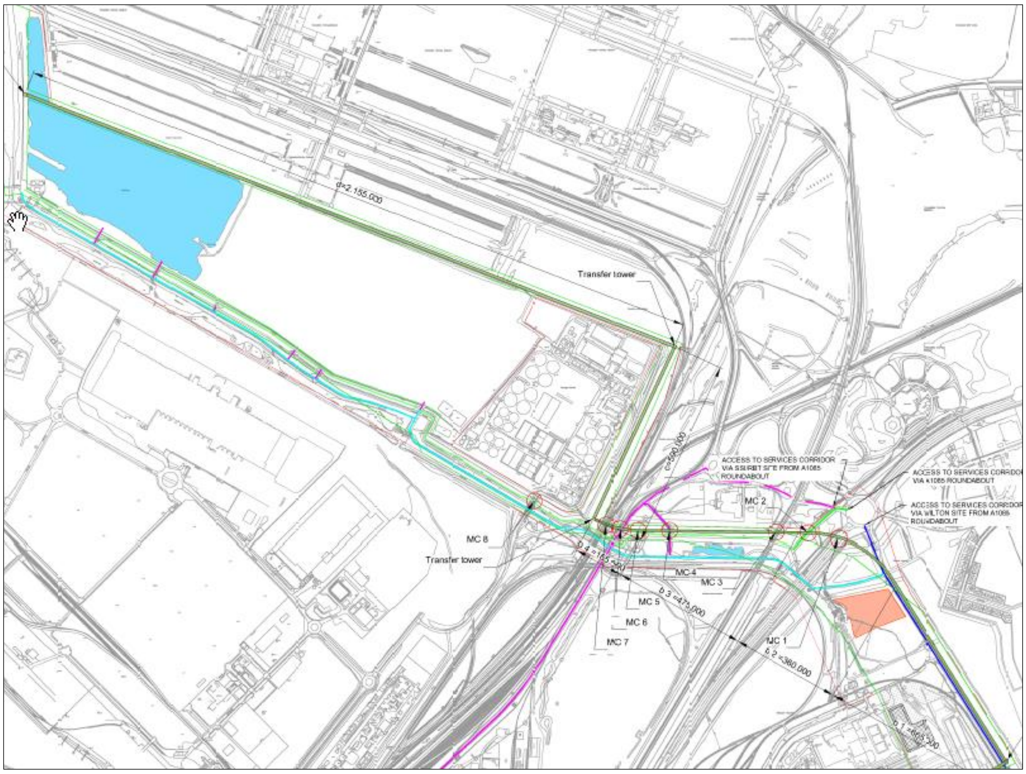


Figure A1.6 - Option VI

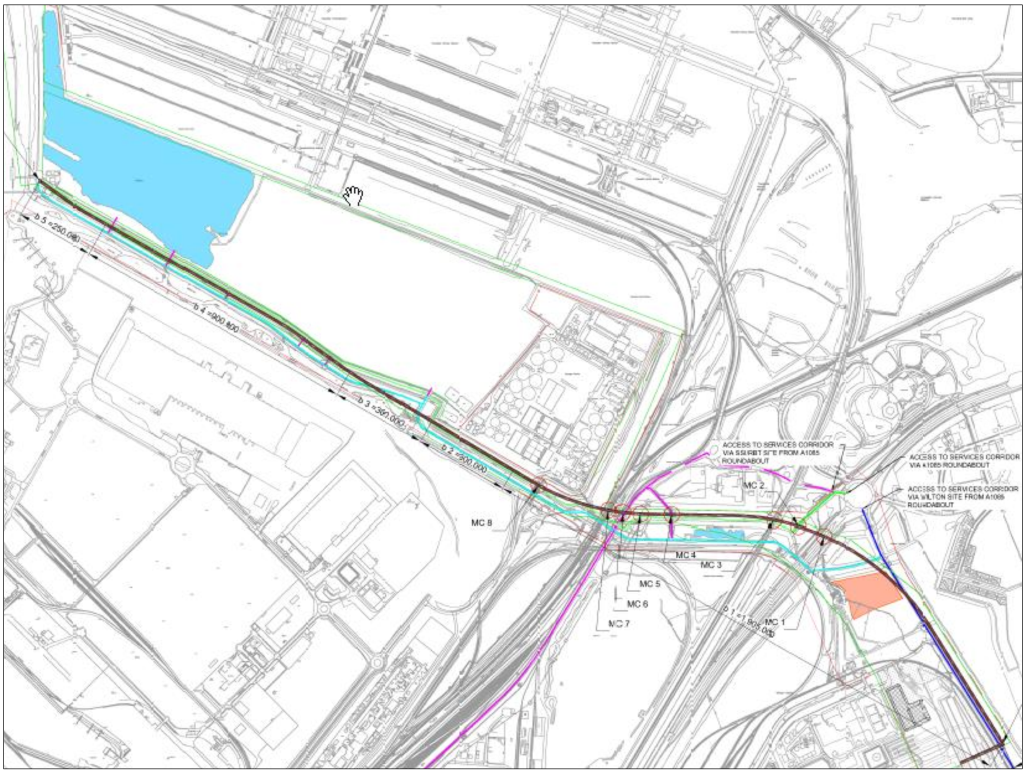


Figure A1.7 - Option VII

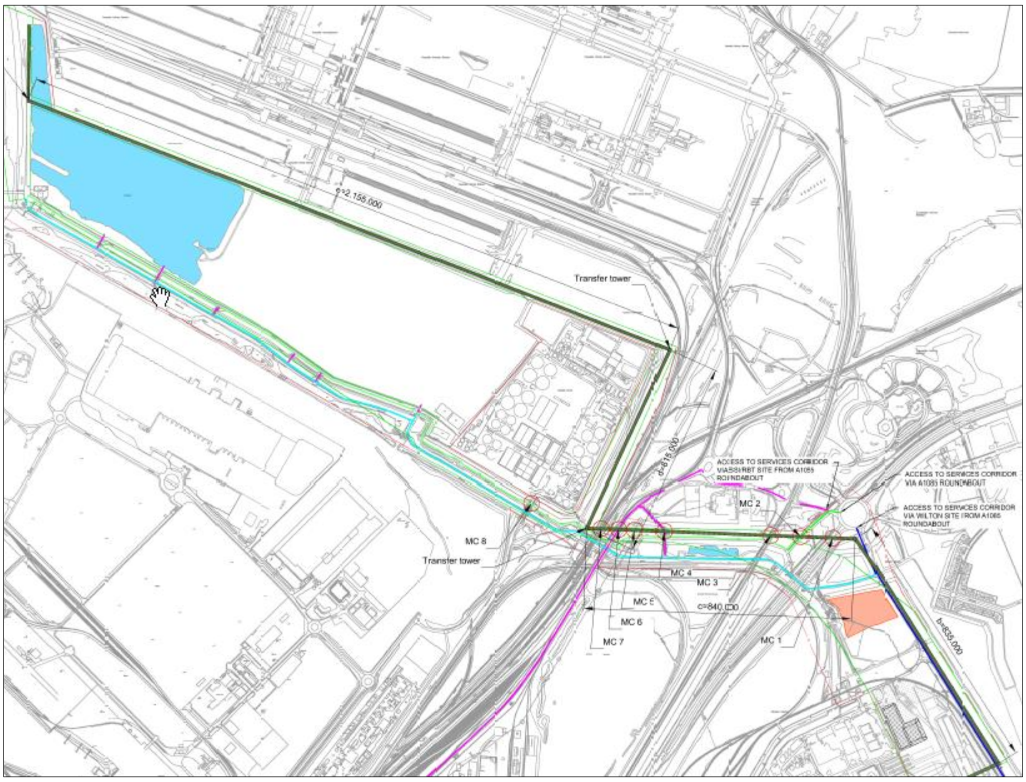


Figure A1.8 - Option VIII

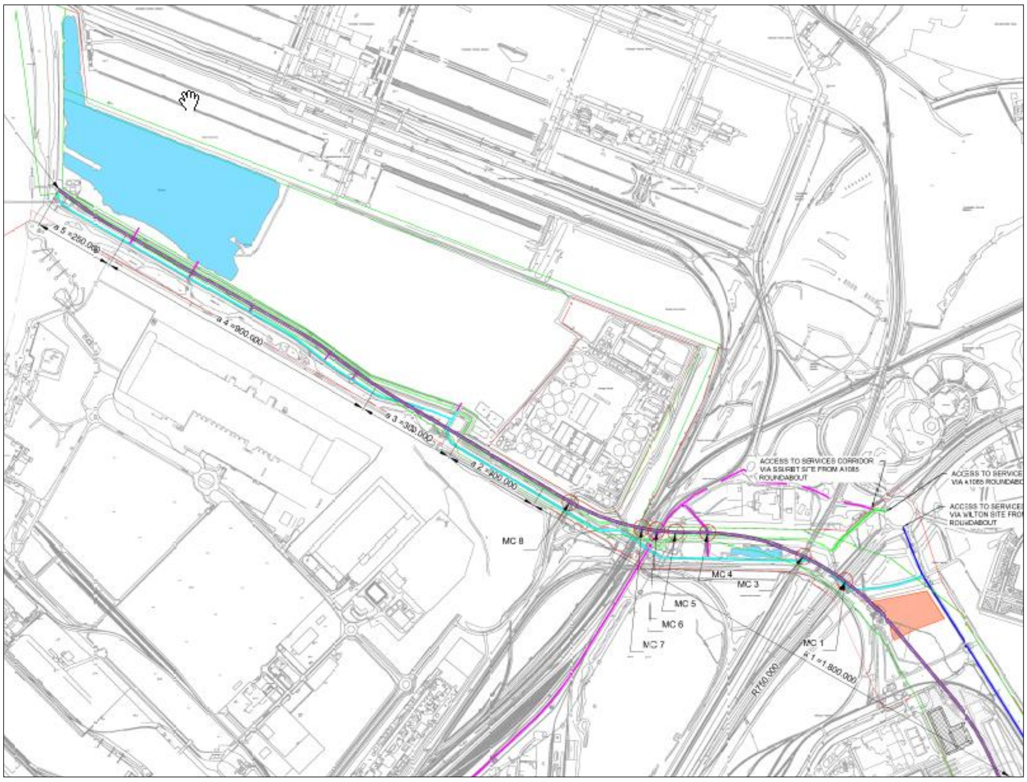


Figure A1.9 - Option IX

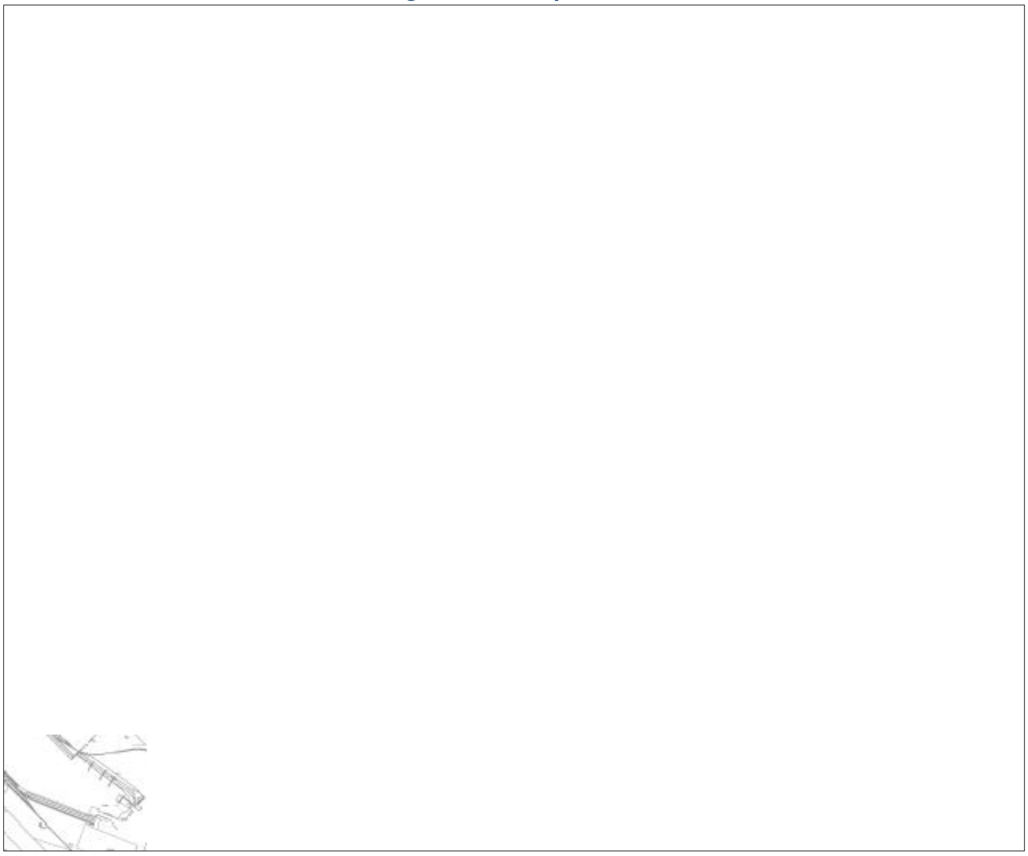


Figure A1.10 - Option X

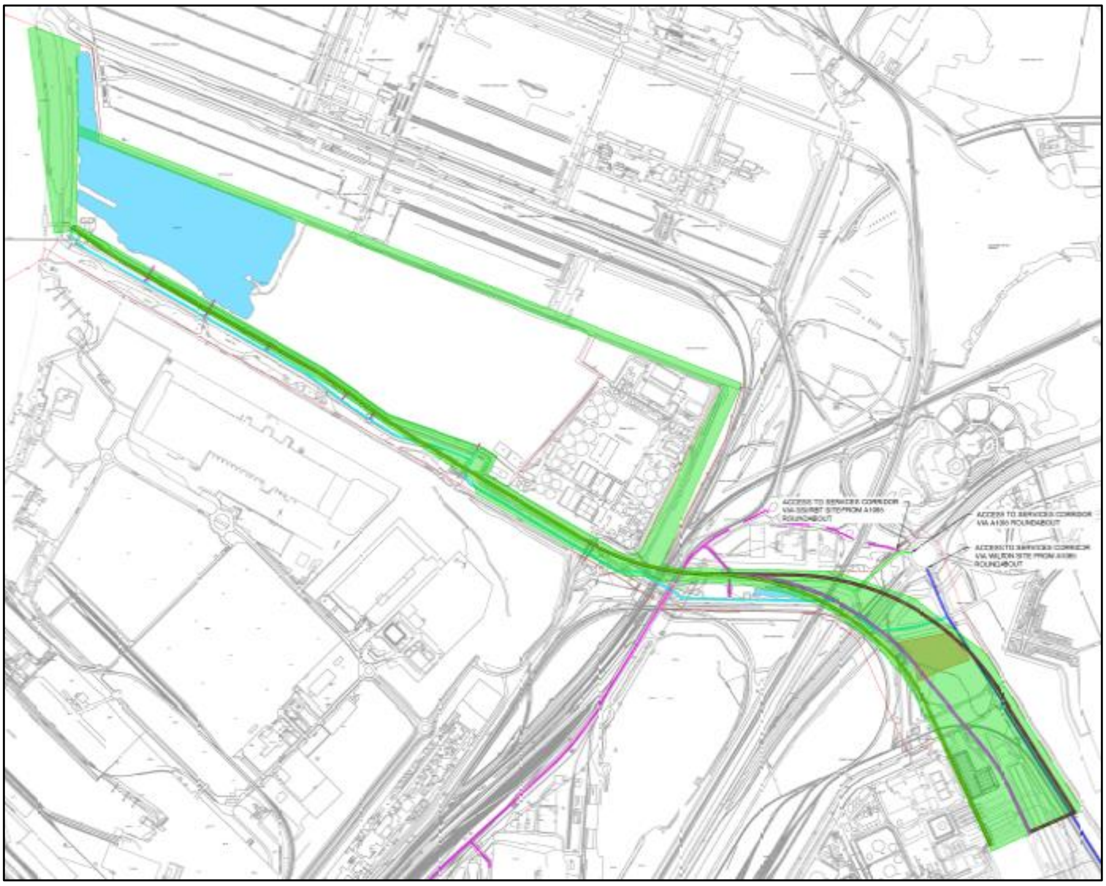


Figure A1.10 Envelope of the above ground routes

APPENDIX 2
UNDERGROUND TUNNEL

As an alternative to the ground level and above ground options, work has also been carried out to understand the viability of an entirely below ground approach. The below ground approach considers the conveyor route between the MHF at the Wilton Site and the Harbour at Bran Sands.

A continuous tunnel with a Process Site located at Bran Sands is not possible given the amount of space required for process and storage facilities required for the Project.

Based on the preliminary ground information only, two construction methodologies have been identified as suitable for a tunnelled alternative to the overland conveyor.

Cut and cover tunnel

'Cut and cover' is an approach used for constructing shallow tunnels in situations where all the ground above the tunnel can be cleared. The first step in the construction is the formation of retaining walls on either side. Once the walls are in place, excavation can be carried out and the base slab constructed. Temporary props will usually be required to stabilise the walls so they can resist the lateral pressure of the soil. The roof of the tunnel can then be constructed and the cover to the tunnel reinstated.

Shielded Earth Pressure Balance Tunnel Boring Machine (EPB TBM)

The Earth Pressure Balance Machine is typically used for excavation in cohesive, medium/low permeability soils. It has been applied in mixed face conditions where rock and soil conditions are encountered in the same tunnel drive.

The face support is provided by the excavated muck itself. A bulkhead separates the tunnel face from the front part of the shield, where the cutterhead operates. The muck is extracted from the chamber by means of a screw conveyor, if soil conditions are encountered the screw permits control and regulation of the quantity of extracted material. The muck conditioning is performed by injections of conditioning agents in the working chamber. A concrete segmental lining is erected behind the face to form the permanent support to the tunnel.

Other tunnelling methods such as the use of open face TBM and conventional mining excavations are not considered suitable due to the constraints and ground conditions within the study area. As the ground is considered to be of weak strength, lateral and face support within the excavated profile are required to support the excavation. Open face TBM or conventional mining methods would not be able to provide adequate support during excavation causing risk of instability within the tunnel.

In considering the options available the following has been assumed:

- The Order Limits for the conveyor route are not fixed therefore alternatives to the current overland conveyor corridor have been studied;
- Ground conditions are based on a preliminary review of the information available at the time of writing, if a tunnel option was to be adopted a more detailed review and ground characterisation would need to be carried out.
- The impact on existing services needs further investigation. Bored tunnelling always causes some ground movement. At shallow cover depths the resulting settlement

will be more concentrated. This may have an adverse effect on structures and services above.

Cut and cover tunnel option

This option consists of a shallow tunnel where the tunnel is excavated from the surface – refer Figure A2.1. As the excavation is performed from the surface using retaining walls, cut and cover tunnel are of rectangular profile. This option would facilitate the construction of the current minimum space proofing identified in Figure A2.2 which indicates a minimum width of 7m to allow for two conveyors of approximately 2m width and three 1m wide maintenance walkways.

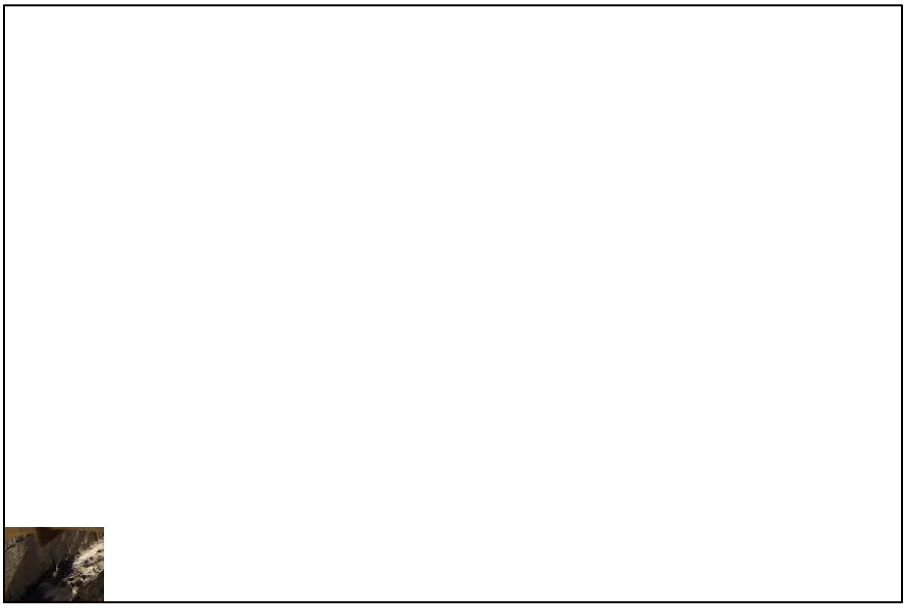


Figure A2.1 Example of cut and cover tunnel

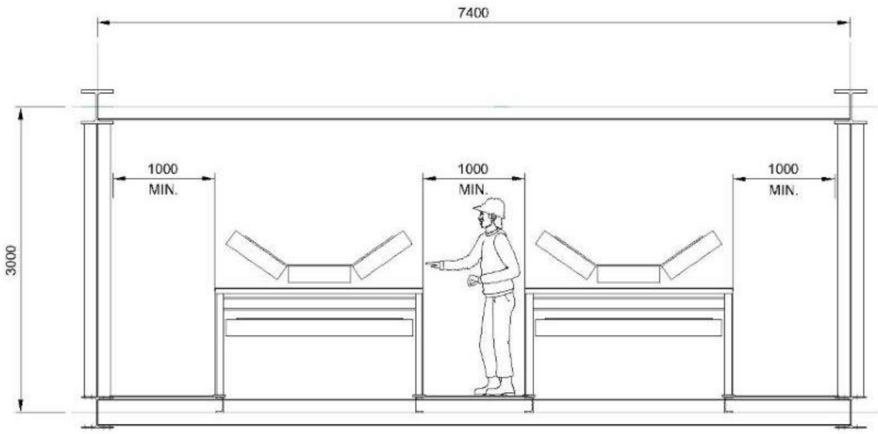


Figure A2.2 Width of Conveyor Envelope

As extensive excavation works are required to construct the cut and cover tunnel, the current overland conveyor corridor is considered not suitable due to the presence of utilities and the proximity of the Dabholm Gut and Bran Sands Lagoon. A new alignment outside the current order limits would need to be adopted which may lead to additional land acquisition being required.

Figure A2.3 shows a possible alignment for the cut and cover tunnel, this would avoid the majority of the services but would still cross railways and the A1085 in order to reach the banks of the river and the shiploader. The alignment would need to be checked against the minimum radius of curvature allowed for the conveyor. The route of the tunnel passes under land that is owned by PD Ports.

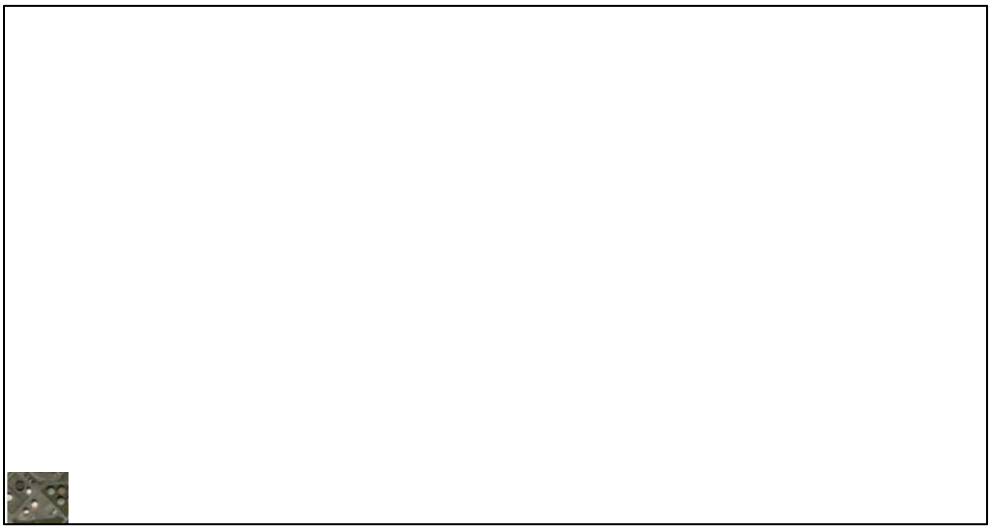


Figure A2.3 Proposed Cut and Cover Tunnel Alignment

It may be a viable option to cross road and rail embankments using the box jacking method. Box jacking, also known as Tunnel Jacking (refer Figure A2.4), involves the advancement of a site cast rectangular or other shaped section using high capacity hydraulic jacks. The structure to be installed is constructed, normally in reinforced concrete, on a launch pad at site adjacent to where it has to be installed. It is then thrust forward horizontally using advance support, open shield and jacking technology with excavation taking place from inside the box.
This is frequently used where an existing road or rail track is on an embankment and space exists for the structure to be cast at the side. The main benefit of this approach is that it offers an effective alternative to the more disruptive open cut techniques, when third party structures are located above the future tunnel. Any streams present within the area would need to be filled and diverted before the box jacking operation can be carried out.

Alternatively a double pipe jacking solution to create a short section of tunnel could be adopted. This would involve each conveyor to be routed into a single tunnel to allow the crossing underneath the asset. Pipe jacking is similar to box jacking but the structure to be jacked is of circular profile.

Figure A2.4 Box jacked into position under a live motorway

The cut and cover tunnelling options assume that the major assets that cannot be diverted can be crossed using either the box jacking or pipe jacking method. This assumption would need to be verified via on site investigations.

The main risks to be considered for this option are contamination of the ground, disposal of excavated material which may possibly present contamination, control of ground water during the excavation and management of third party assets.

Further investigations would need to be carried out and more detailed information gathered on the third parties assets within the study area, to confirm the feasibility of this option.

EPB Tunnel Boring Machine option

The use of an EPB tunnel boring machine to construct the tunnel would minimise disruption to the above ground third party assets and shallow utilities. However to accommodate the space requirements for the two conveyors (refer Figure A2.2) a system of twin bored tunnels would need to be constructed, unless the conveyor space requirements can be revisited to allow for a reduced minimum space.

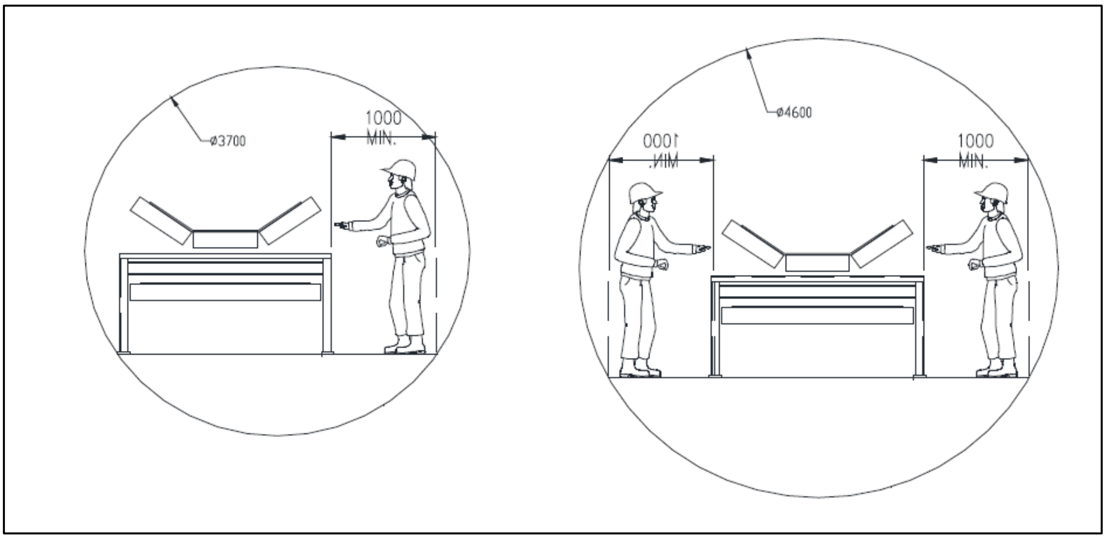


Figure A2.5 Tunnel Cross Sections

Two preliminary cross sections based on the information available at the time of writing have been developed and are shown in Figure A2.5. It is considered that a tunnel to accommodate a 7m space requirement would present a challenge due to the size of the machine required and the depth of the tunnel, therefore two 3.7m diameter tunnels are proposed to accommodate one conveyor and a 1m maintenance walkway, if two maintenance walkways either side of the conveyor are required, the diameter of the bored tunnels would be approximately 4.6m. The tunnels would also need to accommodate services such as lighting and a ventilation system would need to be provided to allow fresh air to enter the tunnel.

Depending on the ventilation requirements fan plants may need to be located at the entrance of the tunnels.

The current configuration of the Mineral Transport System (MTS) tunnel from the mine site at Dove's Nest to the MHF at Wilton has a larger diameter, at approximately 5.05m internal diameter to allow full access for maintenance trains. This configuration would not be practical for the case studied within this report.

Figure A2.6 Conveyor tunnel cross sections

A similar alignment to the one proposed for the cut and cover tunnel would need to be adopted to minimise risks due to the presence of the Bran Sands lagoon and water streams. In addition while tunnelling under the utilities corridor is a feasible solution, the utilities would need to be diverted to allow a portal or box construction to retrieve the TBM therefore an alignment that does not follow the utilities corridor is preferable.

In order to launch and receive the TBM a box structure, shaft or portal would need to be provided both within the Wilton Site and near the river bank. Figure A2.7 illustrates an example of a TBM launch box and portal structures.

Considering the ground condition in the study area, the tunnels would need to be built between 10 and 15m below ground level. A box or shaft structure for launch and reception of the machine would minimise space requirements, however this may present difficulties in terms of conveyor design as the mineral would need to be transferred vertically down to the conveyor within the tunnels. If this cannot be accommodated within the conveyor design a portal structure would be required at the entrance and exit of the tunnels. This may be a fatal flaw due to the limited available space within the Wilton site, unless additional land is acquired within the adjacent sites. For instance the portal for the MTS tunnel within the Wilton site has been laid with a 3.3% gradient due to railway requirements, the portal structure is therefore approximately 360m long to allow the conveyor to reach the surface. Steeper gradients would reduce the length required however considerable space would need to be available for the construction. The size of the shafts at either end of the tunnel would be significant at circa 10 x 10 meters with larger footing below ground to accommodate the head and tail sections of the conveyor.

Figure A2.7 TBM Tunnel Alignment

A bored tunnel solution would minimise disruption to the surface along the alignment but extensive excavation works would still be required for the shaft/box or portal to launch and retrieve the TBM.

Due to the nature of the site the risk of contamination is considered to be high, disposal of excavated material and finding a suitable site may present additional costs. The design would also need to consider flood risk due to the proximity of the River Tees.

APPENDIX 3
A1085 BRIDGE ARCHITECTURE

A1085

The A1085 road is a wide dual carriageway, visually screened by planting from the adjacent industrial landscape. However, in the vicinity of the Lord McGowan Bridge, approaching the crossing, the road is flanked by gantries carrying numerous pipes and various industrial structures and pylons are visible in the background.

Figure A3.1 Lord McGowan Bridge looking towards roundabout and Redcar beyond.

Figure A3.2 View approaching roundabout from Redcar.

When travelling North-East, the road becomes the entry road to Redcar. During a meeting with Redcar and Cleveland Borough Council planning officer a preference was expressed to develop the design to form a gateway into Redcar.

Early designs Options A and B

Early design options showed the simple steel support columns replaced with bold concrete piers. Option A showed these bold and square whilst in option B the piers tapered to soften them slightly.

Figure A3.3 Early Option A – August 2014

Figure A3.4 Early Option B – August 2014

Enhanced early options A and B

Both early options A and B were presented at a meeting with Redcar and Cleveland Borough Council planning officer on the 13th October, together with architectural representations showing views from both the roundabout and the Lord McGowan Bridge.

Figure A3.5 Architectural representation of option A, viewed from roundabout - September 2014

Figure A3.6 Architectural representation of option A, viewed from bridge – September 2014

Figure A3.7 Architectural representation of option B, viewed from roundabout – September 2014

Figure A3.8 Architectural representation of option B, viewed from bridge – September 2014

Although there was a preference for the tapered piers of option B, the design team where asked to develop more options, of a slender visual nature, to complement the agreed new elliptical profile.

Further development – Options C, D and E

The design team explored further options to develop the gateway theme and three alternative options C, D and E showing various design intents were developed as shown below. All three options showed structures supported on foundations located within the confines of the grass strips of land on either side of the A1085.

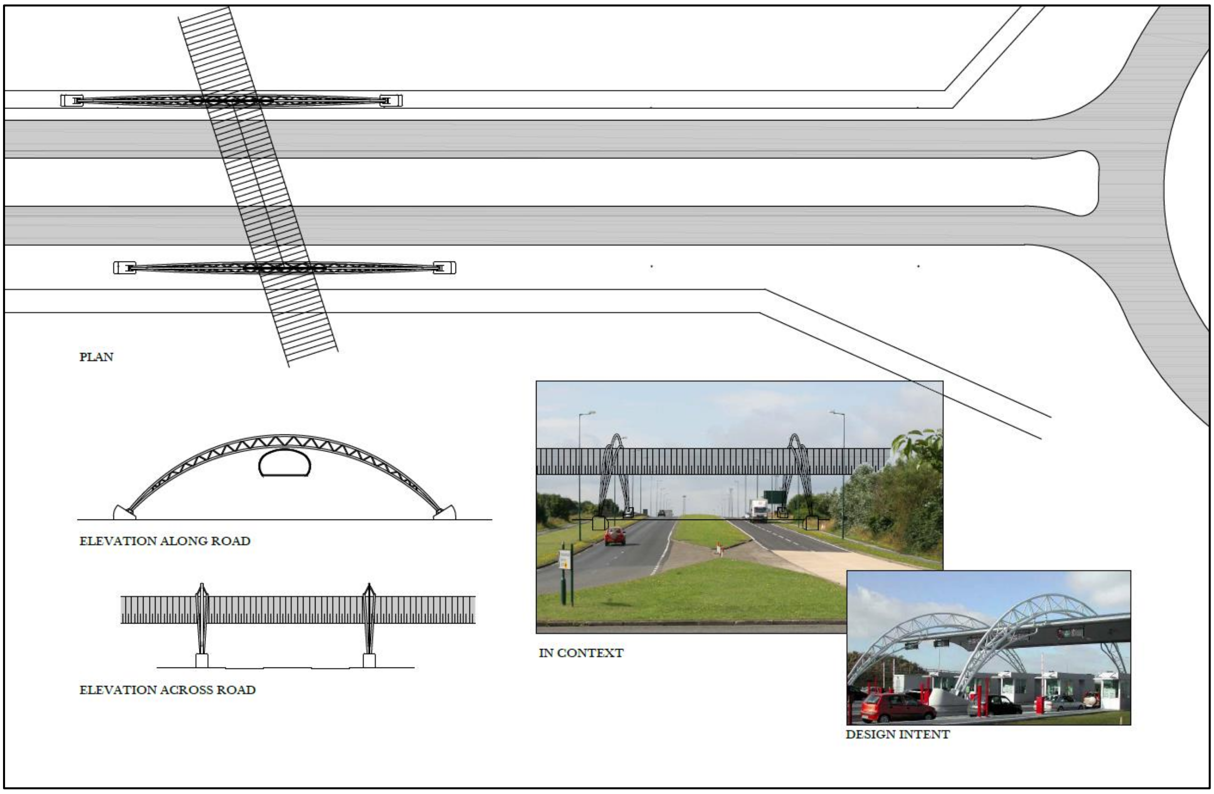


Figure A3.9 Option C consisted of curved trusses on either side of the road, flying over the conveyor, parallel to the road.

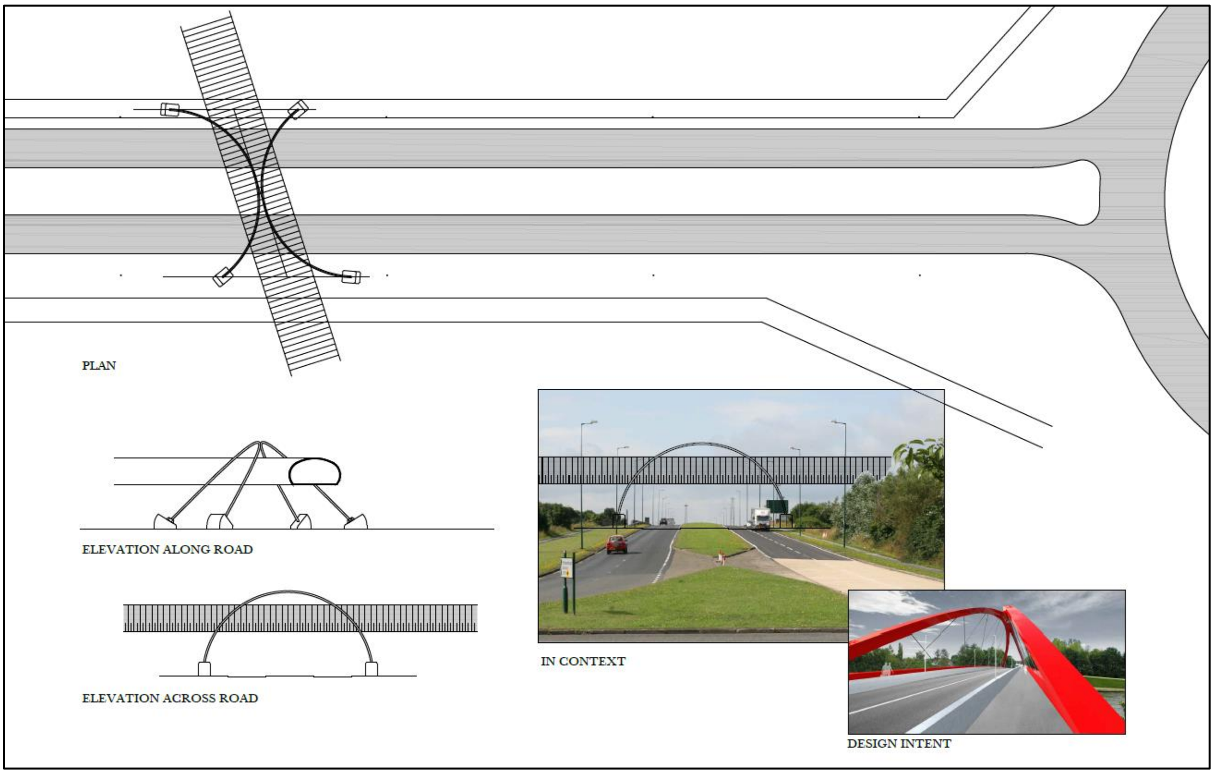


Figure A3.10 Option D consisted of two arches, spanning across the road and inclined towards each other to meet above the conveyor.

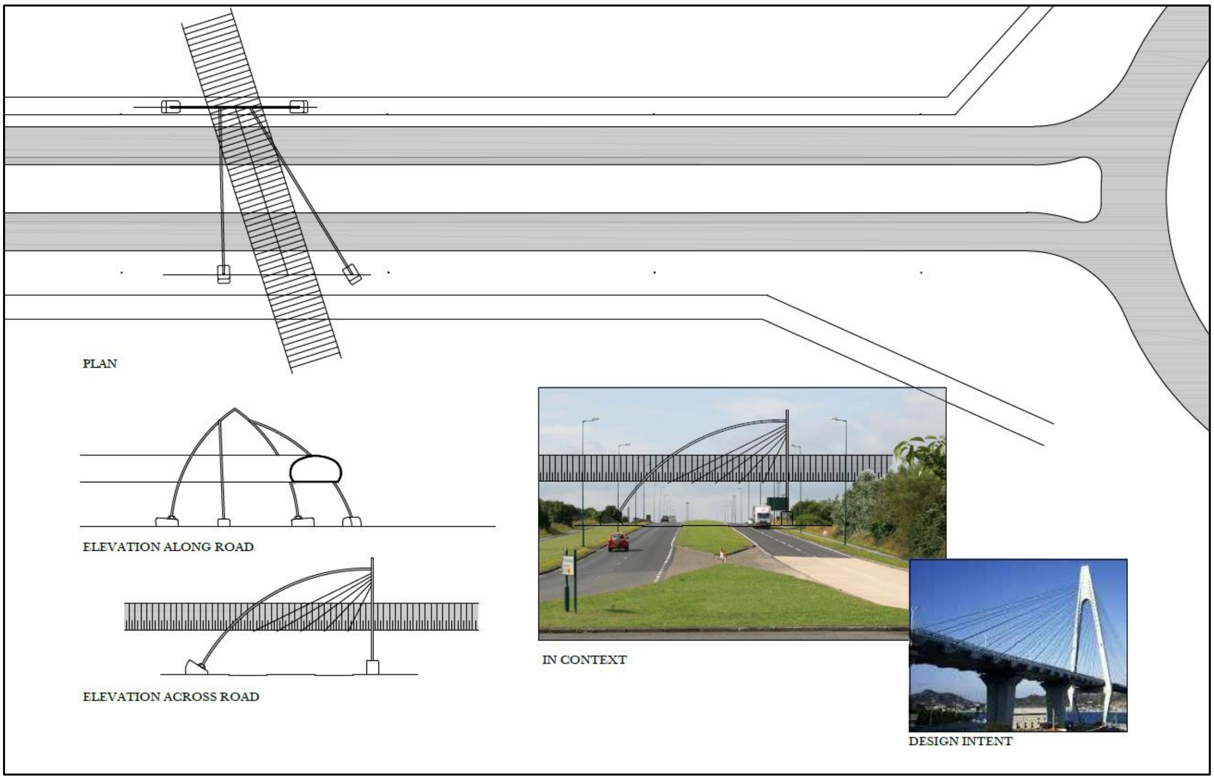


Figure A3.11 Option E was inspired by suspension bridges and consisted of one A frame on one side of the road from which sprang two arches to the other side of the road.

Following the meeting the design team were asked to develop option D further.

Enhanced design options based on option D

The design team developed option D into a workable solution, simple 3-dimensional images showing work in progress of the enhanced design options were presented.

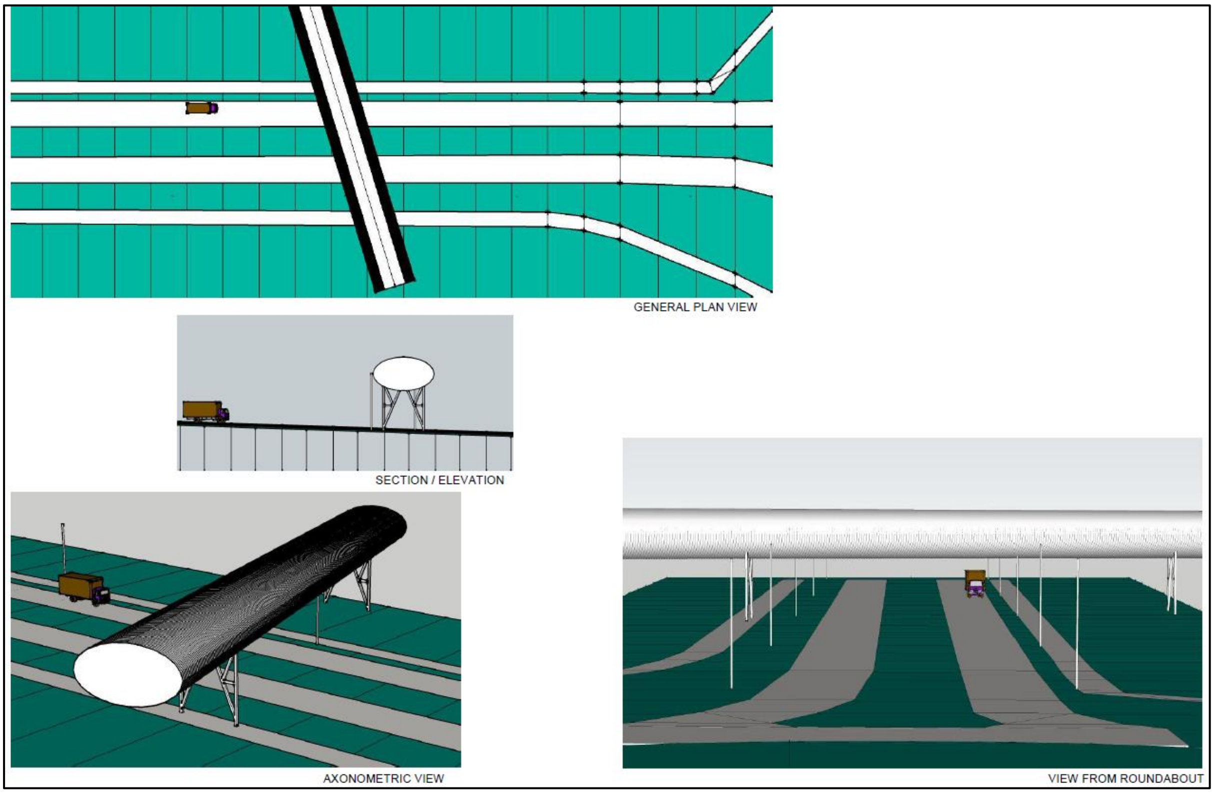


Figure A3.12 Option D1 showed the conveyor only, in its agreed elliptical shape, spanning the road.

Option D2 showed the slanted arches, as per the earlier option D. Some potential problems were identified as follows:

- The arches would have to be quite high (about 6m above the top of the conveyor) for the arches not to touch the sides of the conveyor when aligned in their final position.
- Because the conveyor does not cross the A1085 at a right angle the arches are offset from each other and therefore do not meet at their highest point but somewhat lower.
- The complex geometry will require the use of horizontal members to connect the arches.
- The forces created at the base of the arches will be very high resulting in large foundations.
- Because of the offset of the arches, the arches will be viewed at an angle by people travelling along the A1085 and show an asymmetrical view.

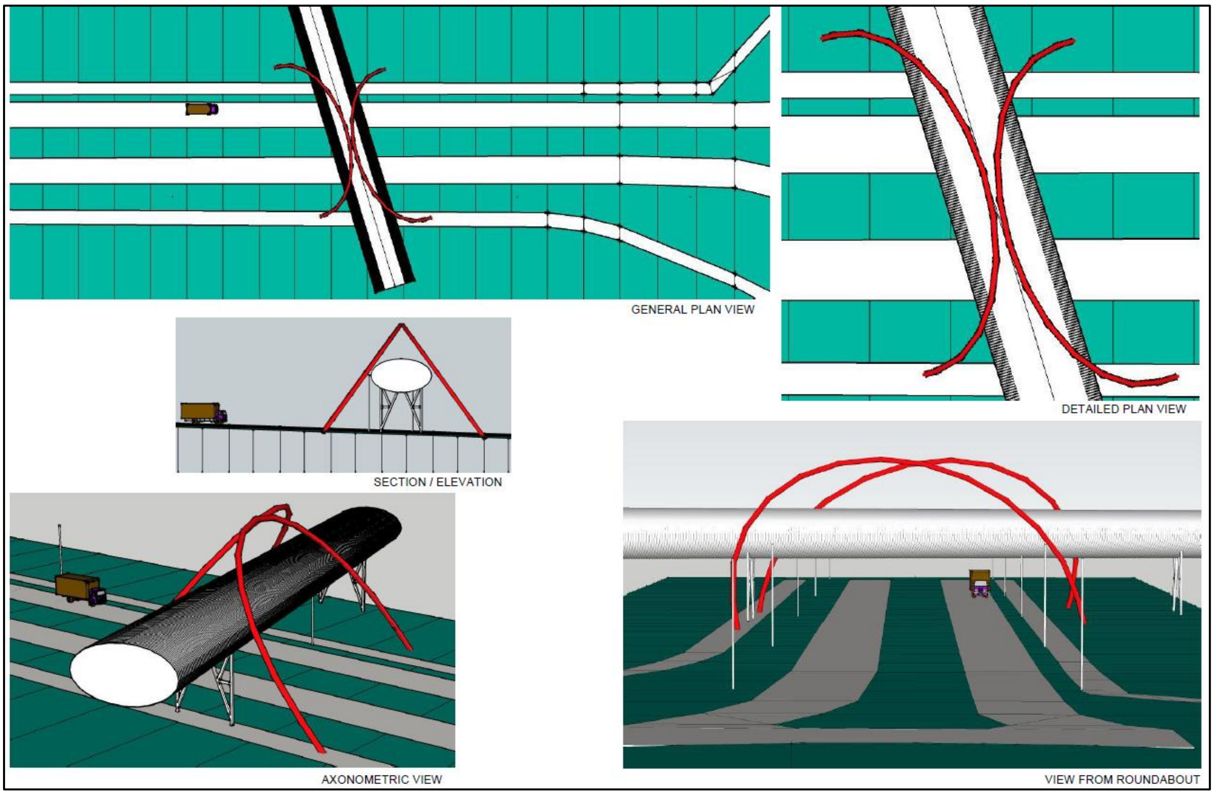


Figure A3.13 Slanted Arches

Option D3 was developed to overcome the potential problems above. It still uses the principle of arches across the road but they are positioned on the diagonals of the foundation points therefore:

- The highest point of the arches is about 2m above the top of the conveyor so the arches are at all points well clear of the sides of the conveyor.
- The arches meet up in the middle, at the highest point.
- There is no need for horizontal connecting members.
- Because the arches are located in a vertical plane along the diagonals, the forces at the base are greatly reduced.
- The arches, when viewed from the road, offer a symmetrical aspect.

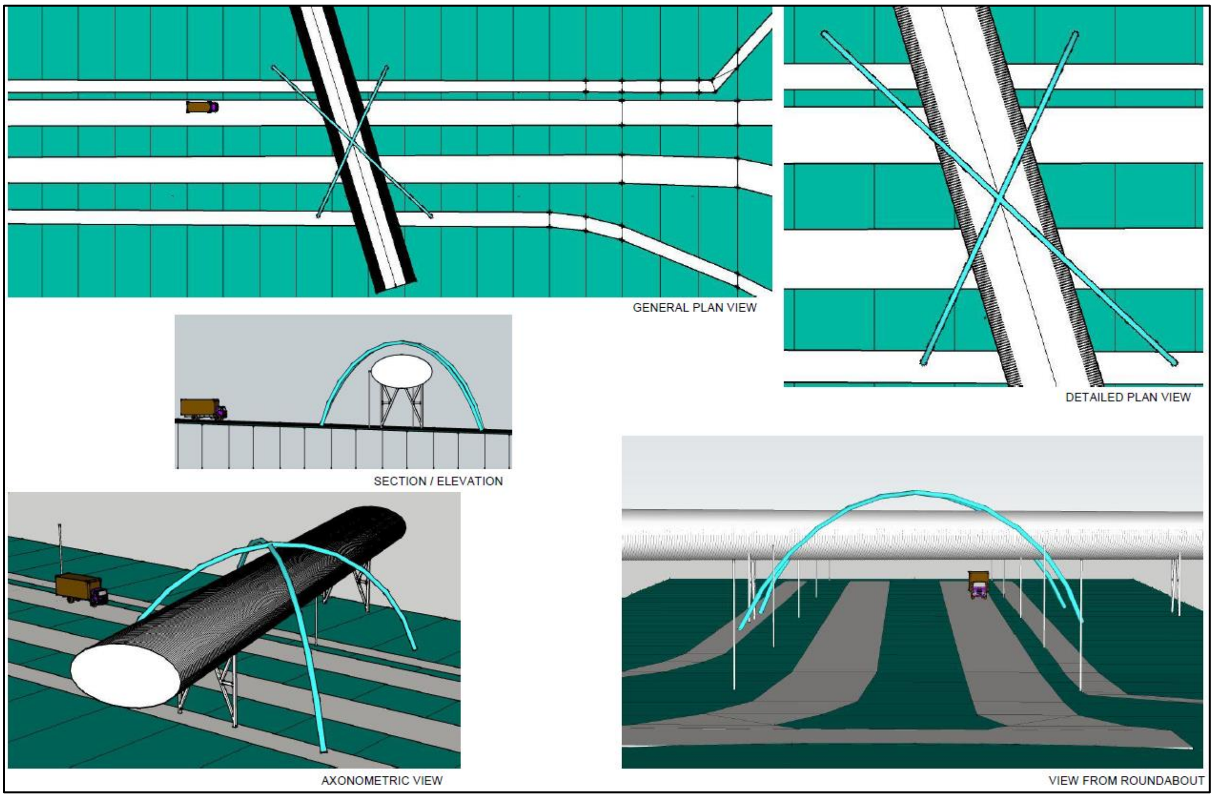


Figure A3.14 Alternative Arch Option

However, the outcome of the meeting was that option D2 remained the preferred option for the design of the crossing across the A1085 forming a gateway to Redcar.

Latest options and architectural impressions

The drawings showing options D1 and D2 were updated as shown below.

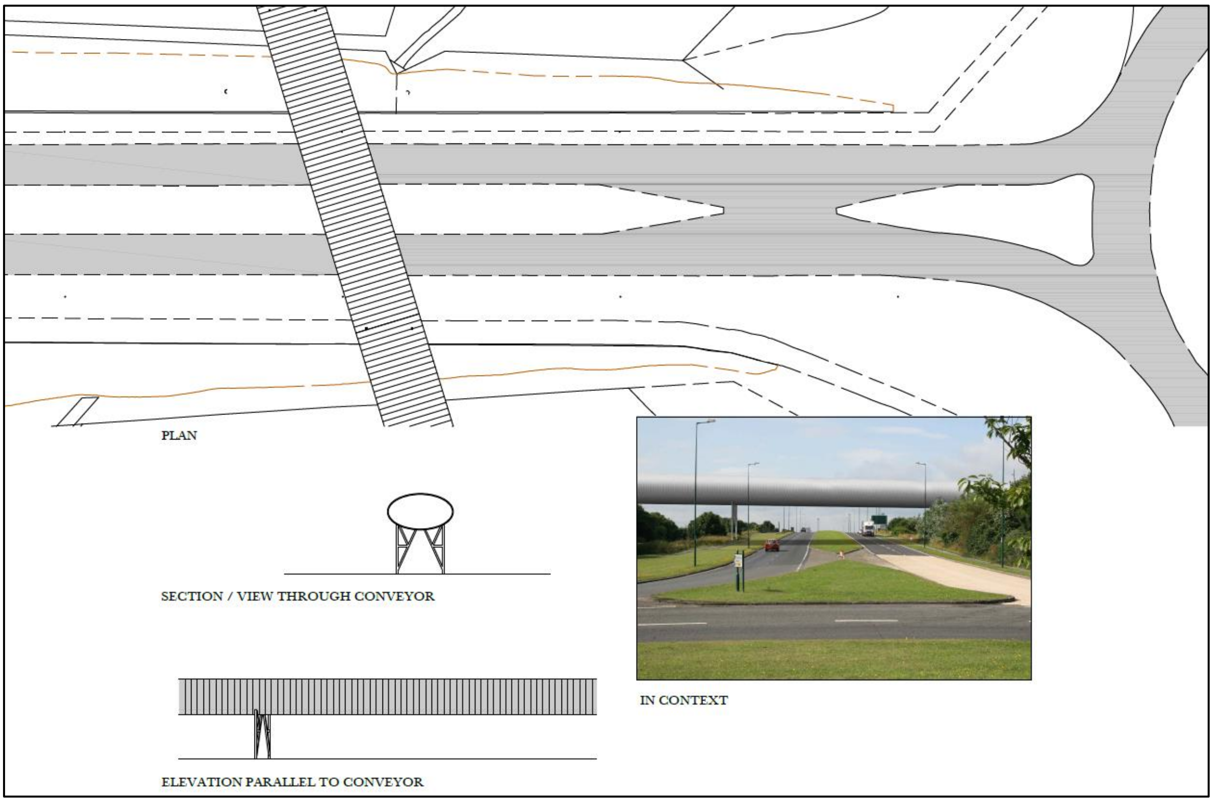


Figure A3.15 Option D1 – conveyor only.

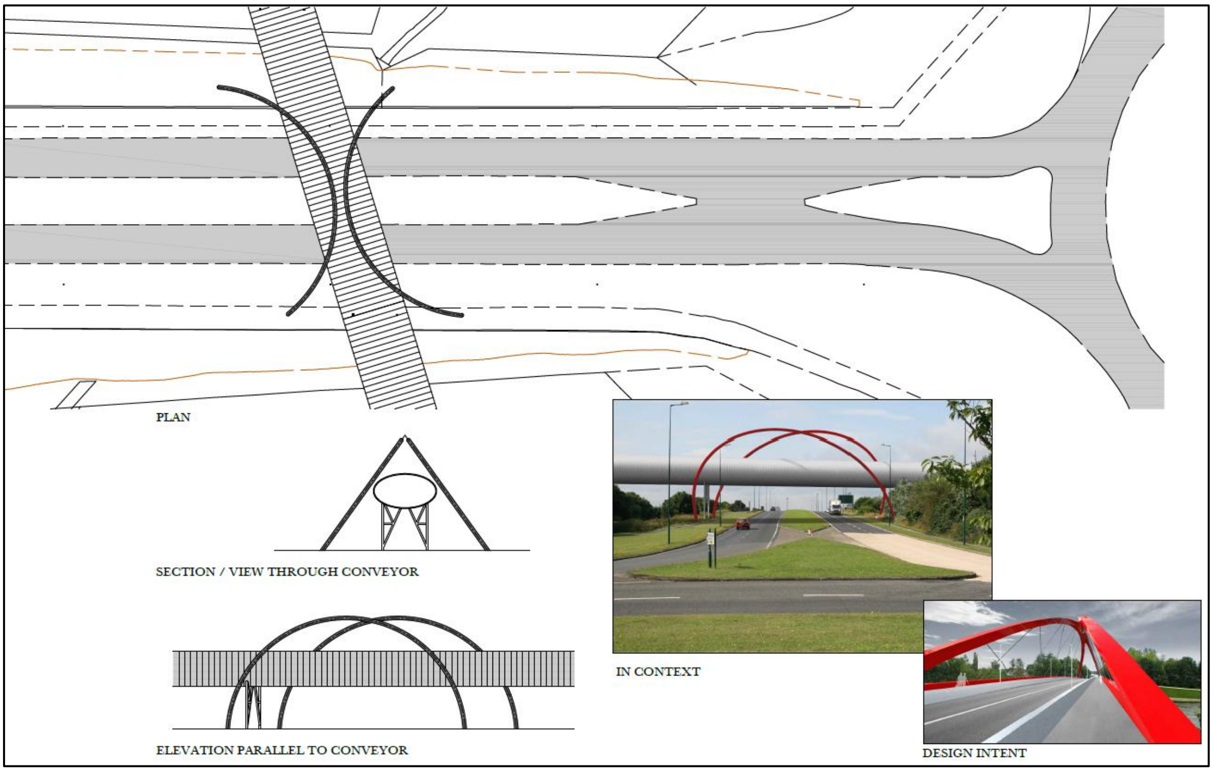


Figure A3.16 Option D2 – conveyor and slanted arches across road.

Updated architectural impressions were also produced, showing both options from the roundabout looking South-East and away from Redcar and in the opposite direction from the top of the bridge, looking down towards the roundabout and Redcar beyond.

Figure A3.17 D1 - Conveyor only viewed from roundabout towards bridge

Figure A3.18 D1 - Conveyor only viewed from bridge towards roundabout.

Figure A3.19 D2 - Conveyor and slanted arches viewed from roundabout towards bridge.

Figure A3.20 D2 - Conveyor and slanted arches viewed from bridge towards roundabout

Alternatives to the arch were revisited and Figure 40 shows the development from Figure 39.

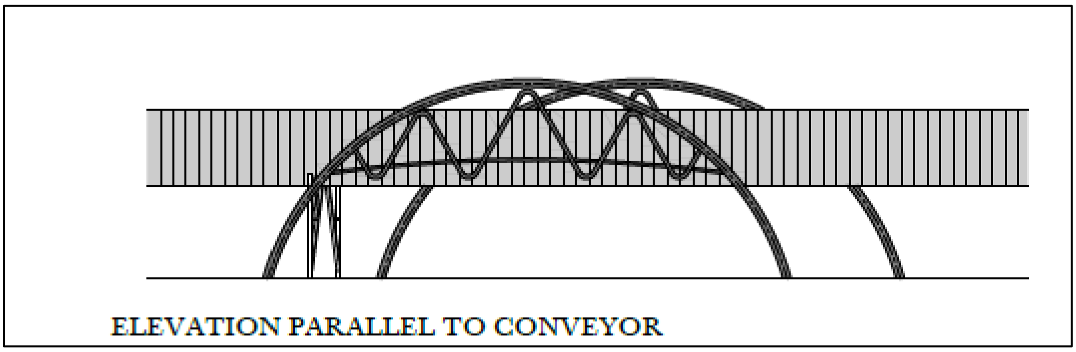


Figure A3.21 – Alternative Arch option

Further to a meeting with officers of Redcar and Cleveland Borough Council a study was also carried out to look into alternative patterns in the cladding and these are represented in the following options Figures A2.22 to A2.24.

Figure A3.22 - Portholes

Figure A3.23 – Wave Form

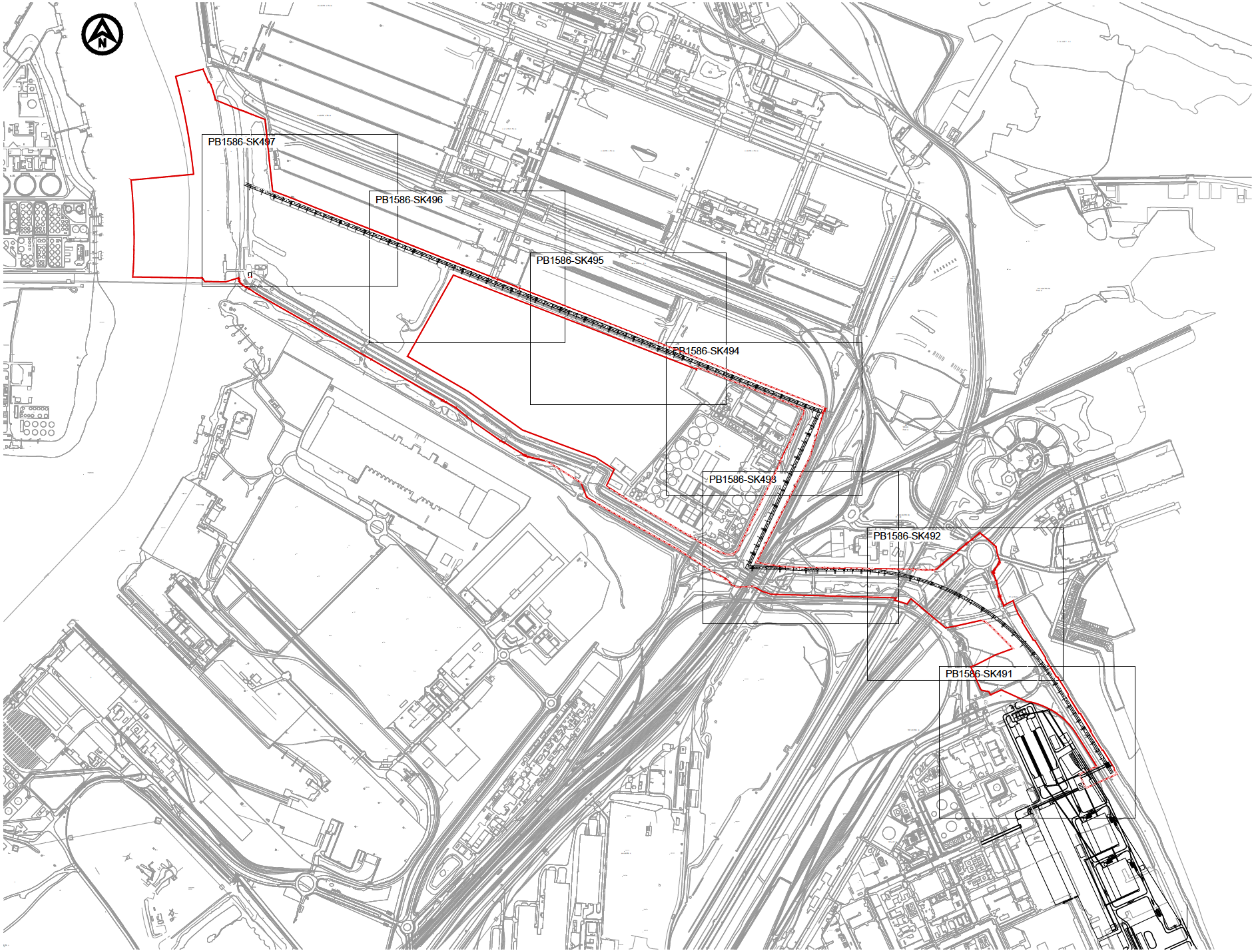
Figure A3.24 –Wave Form with Portholes

Any combination of arches and patterns can be provided depending on whether a blend into the sky line view is required or a distinct stand out appearance.

APPENDIX 4
CONVEYOR ROUTE DRAWINGS

- PB1586-SK490 Northern Route Key Plan
- PB1586-SK491 Northern Route Sheet 1
- PB1586-SK492 Northern Route Sheet 2
- PB1586-SK493 Northern Route Sheet 3
- PB1586-SK494 Northern Route Sheet 4
- PB1586-SK495 Northern Route Sheet 5
- PB1586-SK496 Northern Route Sheet 6
- PB1586-SK497 Northern Route Sheet 7
- PB1586-SK1040 Southern Route Key Plan
- PB1586-SK1041 Southern Route Sheet 1
- PB1586-SK1042 Southern Route Sheet 2
- PB1586-SK1043 Southern Route Sheet 3
- PB1586-SK1044 Southern Route Sheet 4
- PB1586-SK1045 Southern Route Sheet 5
- PB1586-SK1046 Southern Route Sheet 6

DRG No. PB1586-SK490



NOTES

REV	DATE	DESCRIPTION	BY	CHK	APP
E	9 03 5	PLANN NG ISSUE	LW	DGB	MH
D	6 03 5	MINOR REVISIONS	CH	DGB	MH
C	3 03 5	MINOR REVISIONS	LW	DGB	MH
B	05 03 5	ISSUED FOR INFORMATION	TF	DGB	MH
A	27 02 5	FIRST ISSUE	LW	DGB	RWP

REVISIONS

YORKPOTASH
A Sirius Minerals Project

PROJECT

YORK POTASH

TITLE

THE YORK POTASH
HARBOUR FACILIT ES ORDER 201X
CONVEYOR NORTHERN ROUTE - KEY PLAN
REGULATION 5(2)(o)
DOCUMENT 3.3H

HASKONINGDHV UK LTD
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DRAWN LW	CHECKED DGB	PASSED RWP
DATE FEB'15	CLIENT S REF.	
SCALE AT A1 NTS	AUTOCAD REF. PB1586-SK490	

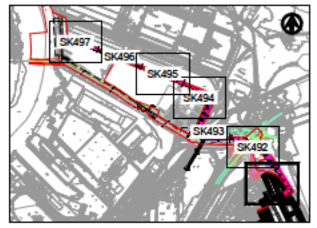
DRAW NG No. PB1586-SK490
REVISION E

DRG No. PB1586-SK491

NOTES

MAJOR CROSSINGS

MC 0	Eastern Boundary Road	- Pass over in bridge
MC 1	Highway A1085	- Pass over in bridge
MC 2	YPL 1st access road	- Pass over in bridge
MC 3	Hot metal ra l	- Pass over in bridge
MC 4	NWL 2nd access road	- Pass over in bridge
MC 5	National power grid lines	- Pass under 10 m clearance
MC 6	SSI road bridge	- Pass over in bridge
MC 7	National rail way	- Pass over in bridge
MC 8	Access NWL W.T.P.	- Pass over in bridge
MC 9	Outfall	- Pass over in bridge



KEY PLAN
SCALE 1 50000

LEGEND - CONVEYOR

- TYPE 3 - OPEN CONVEYOR - 2 LEGS
- TYPE 4 - OVAL ENCLOSED CONVEYOR - 2 LEGS
- TRANSFER TOWER
- ACCESS ROUTES
- CONVEYOR FOOTINGS
- CONVEYOR AT THE QUAY

LEGEND - EXISTING SERVICES

- EASEMENT ZONES
- GAS - BP CATS
- GAS - GDF SUEZ
- GAS - RWE
- FIBRE OPTIC CABLE
- MISC - DRAINS, CABLES, DUCTS
- FOUL WATER - SEMBCORP
- WATER - NWL
- GAS - ABANDONED
- ABOVEGROUND PIPELINE CORRIDOR
- OVERHEAD POWER CABLES
- CONVEYOR LATERAL LIMITS OF DEVIATION

REV	DATE	DESCRIPTION	BY	CHK	APP
E	9 03 5	PLANN NG ISSUE	LW	DGB	MH
D	6 03 5	MINOR REVISIONS	CH	DGB	MH
C	2 03 5	MINOR REVISIONS	LW	DGB	MH
B	05 03 5	ISSUED FOR APPROVAL	TF	DGB	MH
A	27 02 5	FIRST ISSUE	LW	DGB	RWP

REVISIONS

YORKPOTASH
A Sirius Minerals Project

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YORK POTASH

TITLE
THE YORK POTASH
HARBOUR FACILIT ES ORDER 201X
CONVEYOR ROUTE PLANS
NORTHERN ROUTE - SHEET 1
REGULATION 5(2)(o) DOCUMENT 3 3I

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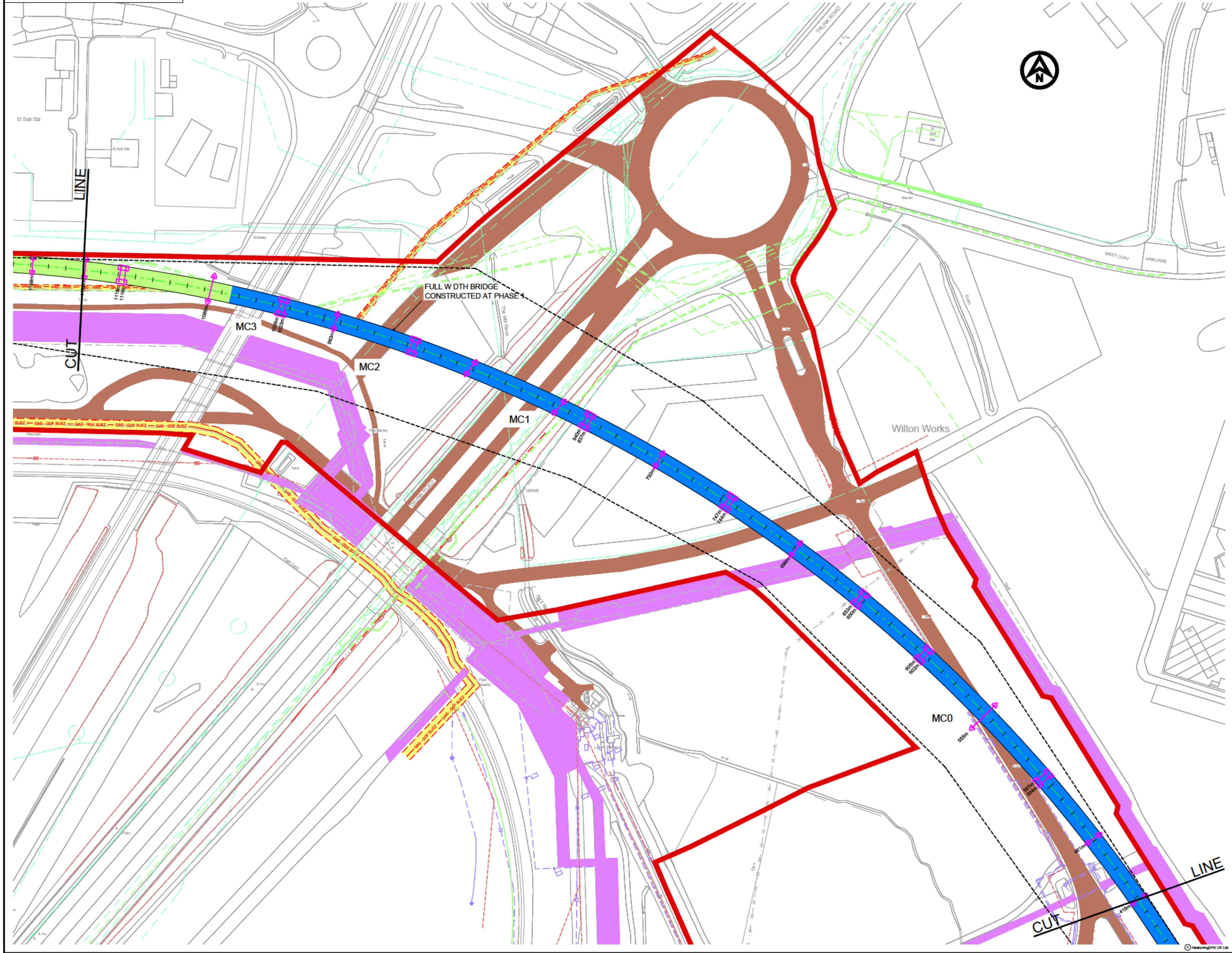
SCALE AT A1	1 1000	AUTOCAD REF.	PB1586-SK491		

DRAW NG No. PB1586-SK491 REVISION E

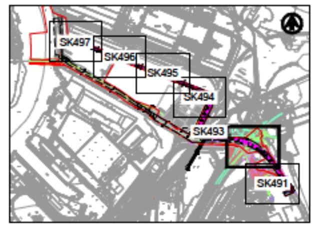
DRG No. PB1586-SK492



NOTES

MAJOR CROSSINGS

MC 0	Eastern Boundary Road	- Pass over in bridge
MC 1	Highway A1085	- Pass over in bridge
MC 2	YPL 1st access road	- Pass over in bridge
MC 3	Hot metal rail	- Pass over in bridge
MC 4	NWL 2nd access road	- Pass over in bridge
MC 5	National power grid lines	- Pass under 10 m clearance
MC 6	SSI road bridge	- Pass over in bridge
MC 7	National rail way	- Pass over in bridge
MC 8	Access NWL W.T.P.	- Pass over in bridge
MC 9	Outfall	- Pass over in bridge



KEY PLAN

SCALE 1 50000

LEGEND - CONVEYOR

- TYPE 3 - OPEN CONVEYOR - 2 LEGS
- TYPE 4 - OVAL ENCLOSED CONVEYOR - 2 LEGS
- TRANSFER TOWER
- ACCESS ROUTES
- CONVEYOR FOOTINGS
- CONVEYOR AT THE QUAY

LEGEND - EXISTING SERVICES

- EASEMENT ZONES
- GAS - BP CATS
- GAS - GDF SUEZ
- GAS - RWE
- FIBRE OPTIC CABLE
- MISC - DRAINS, CABLES, DUCTS
- FOUL WATER - SEMBCORP
- WATER - NWL
- GAS - ABANDONED
- ABOVEGROUND PIPELINE CORRIDOR
- OVERHEAD POWER CABLES
- CONVEYOR LATERAL LIMITS OF DEVIATION

REV	DATE	DESCRIPTION	BY	CHK	APP
E	[illegible]	PLANNING ISSUE	LW	DGB	MH
D	[illegible]	MINOR REV SIONS	CH	DGB	MH
C	[illegible]	MINOR REV SIONS	LW	DGB	MH
B	[illegible]	ISSUED FOR APPROVAL	TF	DGB	MH
A	[illegible]	F RST ISSUE	LW	DGB	RWP

REVISIONS

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A Sirius Minerals Project

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YORK POTASH

TITLE

THE YORK POTASH
HARBOUR FACILIT ES ORDER 201X
CONVEYOR ROUTE PLANS
NORTHERN ROUTE - SHEET 2
REGULATION 5(2)(o) DOCUMENT 3 3J

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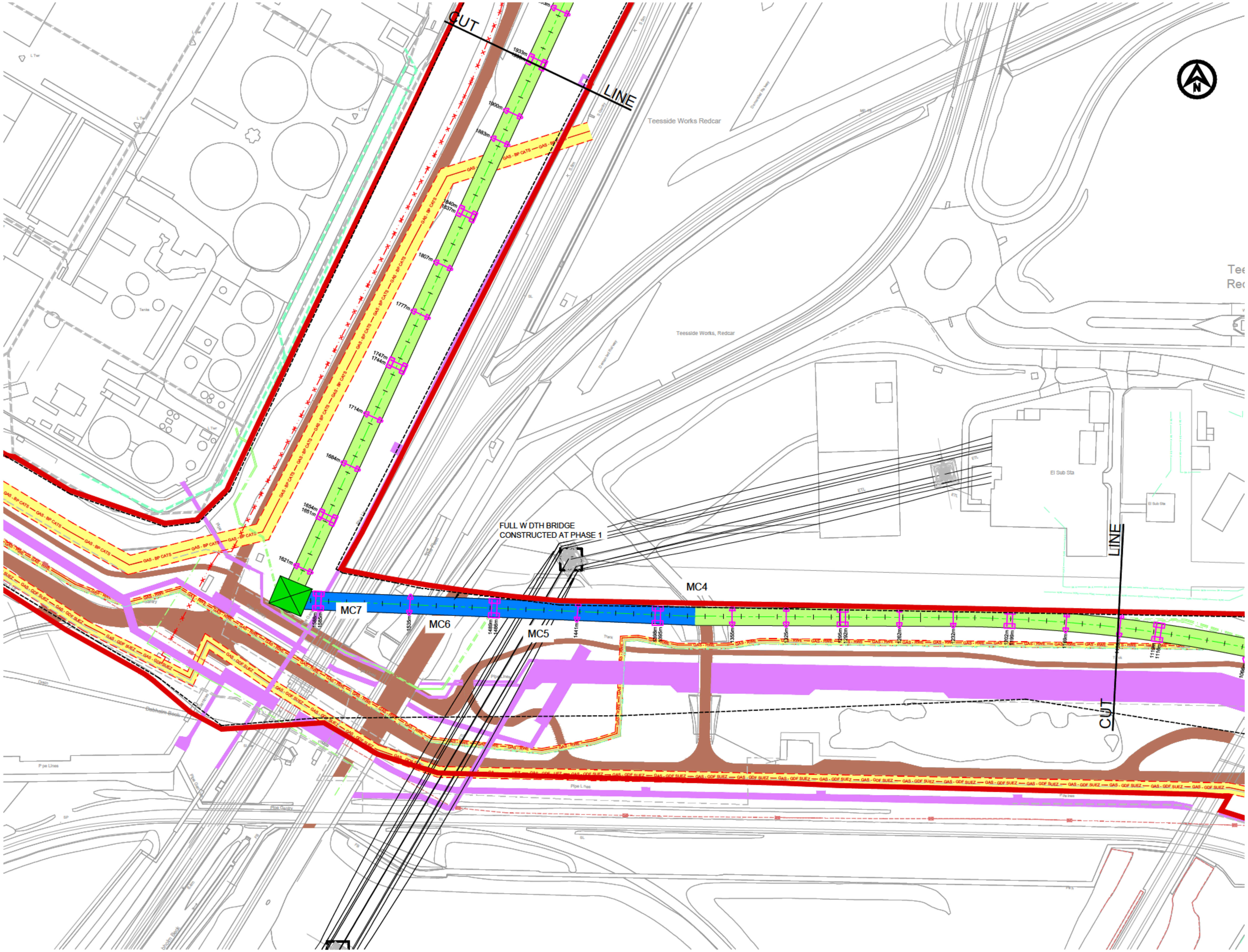
MARITIME & WATERWAYS

DRAWN	LW	CHECKED	DGB	PASSED	RWP
DATE	FEB'15	CLIENT S REF.			
SCALE AT A1	1 1000	AUTOCAD REF.	PB1586-SK492		

DRAWING No. PB1586-SK492

REVISION E

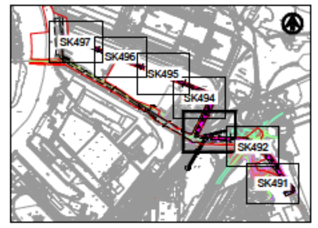
DRG No. PB1586-SK493



NOTES

MAJOR CROSSINGS

MC 0	Eastern Boundary Road	- Pass over in bridge
MC 1	Highway A1085	- Pass over in bridge
MC 2	YPL 1st access road	- Pass over in bridge
MC 3	Hot metal rail	- Pass over in bridge
MC 4	NWL 2nd access road	- Pass over in bridge
MC 5	National power grid lines	- Pass under 10 m clearance
MC 6	SSI road bridge	- Pass over in bridge
MC 7	National rail way	- Pass over in bridge
MC 8	Access NWL W.T.P.	- Pass over in bridge
MC 9	Outfall	- Pass over in bridge



KEY PLAN
SCALE 1 50000

LEGEND - CONVEYOR

- TYPE 3 - OPEN CONVEYOR - 2 LEGS
- TYPE 4 - OVAL ENCLOSED CONVEYOR - 2 LEGS
- TRANSFER TOWER
- ACCESS ROUTES
- CONVEYOR FOOTINGS
- CONVEYOR AT THE QUAY

LEGEND - EXISTING SERVICES

- EASEMENT ZONES
- GAS - BP CATS
- GAS - GDF SUEZ
- GAS - RWE
- FIBRE OPTIC CABLE
- MISC - DRAINS, CABLES, DUCTS
- FOUL WATER - SEMBCORP
- WATER - NWL
- GAS - ABANDONED
- ABOVEGROUND PIPELINE CORRIDOR
- OVERHEAD POWER CABLES
- CONVEYOR LATERAL LIMITS OF DEVIATION

REV	DATE	DESCRIPTION	BY	CHK	APP
E	9 03 5	PLANNING ISSUE	LW	DGB	MH
D	6 03 5	MINOR REV SIONS	CH	DGB	MH
C	03 5	MINOR REV SIONS	LW	DGB	MH
B	05 03 5	ISSUED FOR APPROVAL	TF	DGB	MH
A	27 02 5	F RST ISSUE	LW	DGB	RWP

REVISIONS

YORKPOTASH
A Sirius Minerals Project

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YORK POTASH

TITLE
THE YORK POTASH
HARBOUR FACILIT ES ORDER 201X
CONVEYOR ROUTE PLANS
NORTHERN ROUTE - SHEET 3
REGULATION 5(2)(o) DOCUMENT 3.3K

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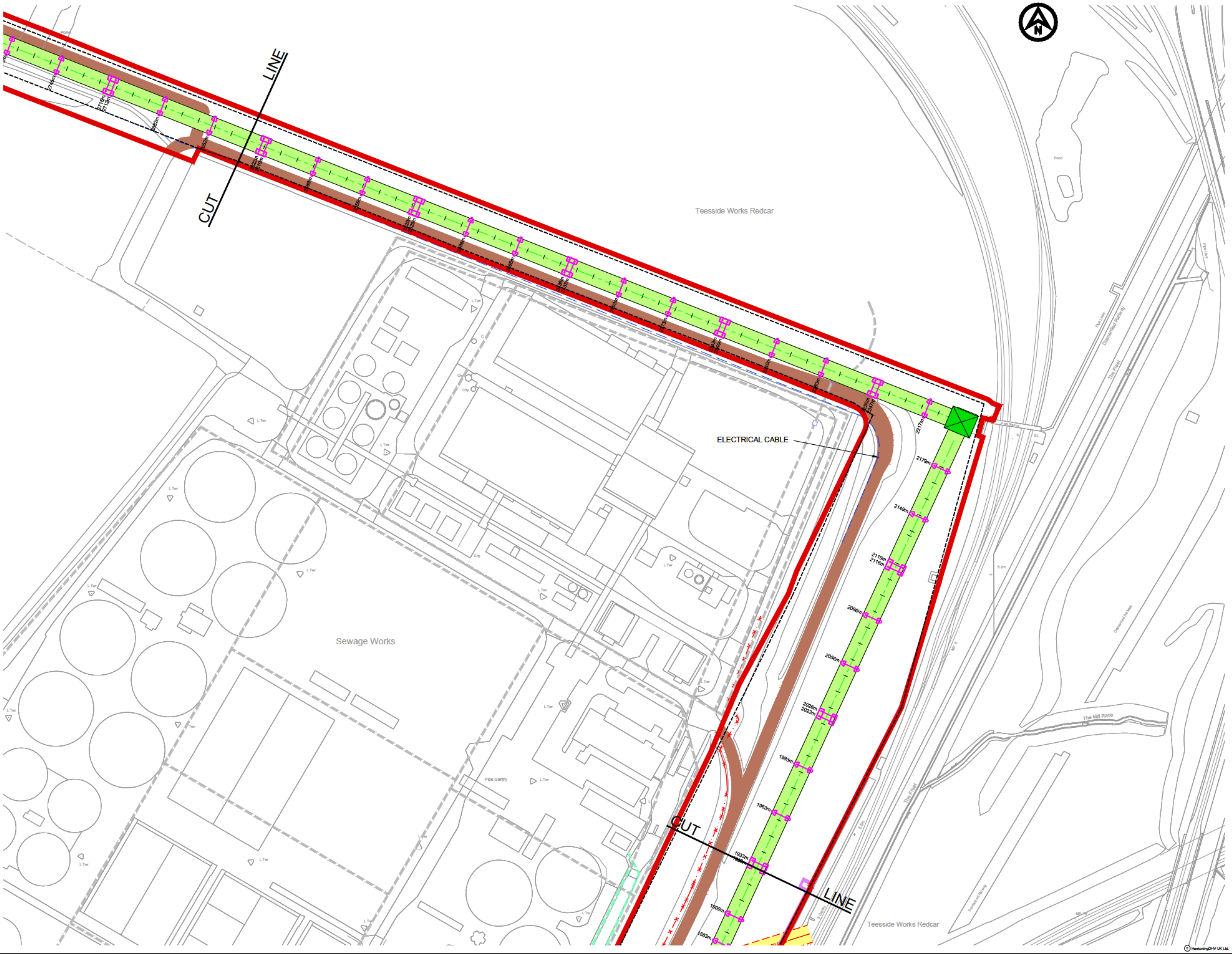
DATE	FEB'15	CLIENT S REF.			
SCALE AT A1	1 1000	AUTOCAD REF.	PB1586-SK493		

DRAWING No. PB1586-SK493
REVISION E

DRG No. PB1586-SK494

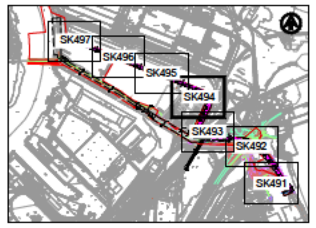


NOTES

1. FOR QUAY PLAN DETAILS REFER TO DRAWINGS NO. PB1586-SK91, SK93, SK122 & SK123.

MAJOR CROSSINGS

MC 0	Eastern Boundary Road	- Pass over in bridge
MC 1	Highway A1085	- Pass over in bridge
MC 2	YPL 1st access road	- Pass over in bridge
MC 3	Hot metal rail	- Pass over in bridge
MC 4	NWL 2nd access road	- Pass over in bridge
MC 5	National power grid lines	- Pass under 10 m clearance
MC 6	SSI road bridge	- Pass over in bridge
MC 7	National rail way	- Pass over in bridge
MC 8	Access NWL W.T.P.	- Pass over in bridge
MC 9	Outfall	- Pass over in bridge



KEY PLAN

SCALE 1 50000

LEGEND - CONVEYOR

- TYPE 3 - OPEN CONVEYOR - 2 LEGS
- TYPE 4 - OVAL ENCLOSED CONVEYOR - 2 LEGS
- TRANSFER TOWER
- ACCESS ROUTES
- CONVEYOR FOOTINGS
- CONVEYOR AT THE QUAY

LEGEND - EXISTING SERVICES

- EASEMENT ZONES
- GAS - BP CATS
- GAS - GDF SUEZ
- GAS - RWE
- FIBRE OPTIC CABLE
- MISC - DRAINS, CABLES, DUCTS
- FOUL WATER - SEMBCORP
- WATER - NWL
- GAS - ABANDONED
- ABOVEGROUND PIPELINE CORRIDOR
- OVERHEAD POWER CABLES
- CONVEYOR LATERAL LIMITS OF DEVIATION
- ELECTRICAL CABLE

REV	DATE	DESCRIPTION	BY	CHK	APP
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D	[illegible]	MINOR REV SIONS	CH	DGB	MH
C	[illegible]	MINOR REV SIONS	LW	DGB	MH
B	[illegible]	ISSUED FOR APPROVAL	TF	DGB	MH
A	[illegible]	F RST ISSUE	LW	DGB	RWP

REVISIONS

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A Sirius Minerals Project

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YORK POTASH

TITLE
THE YORK POTASH
HARBOUR FACILIT ES ORDER 201X
CONVEYOR ROUTE PLANS
NORTHERN ROUTE - SHEET 4
REGULATION 5(2)(o) DOCUMENT 3 3L

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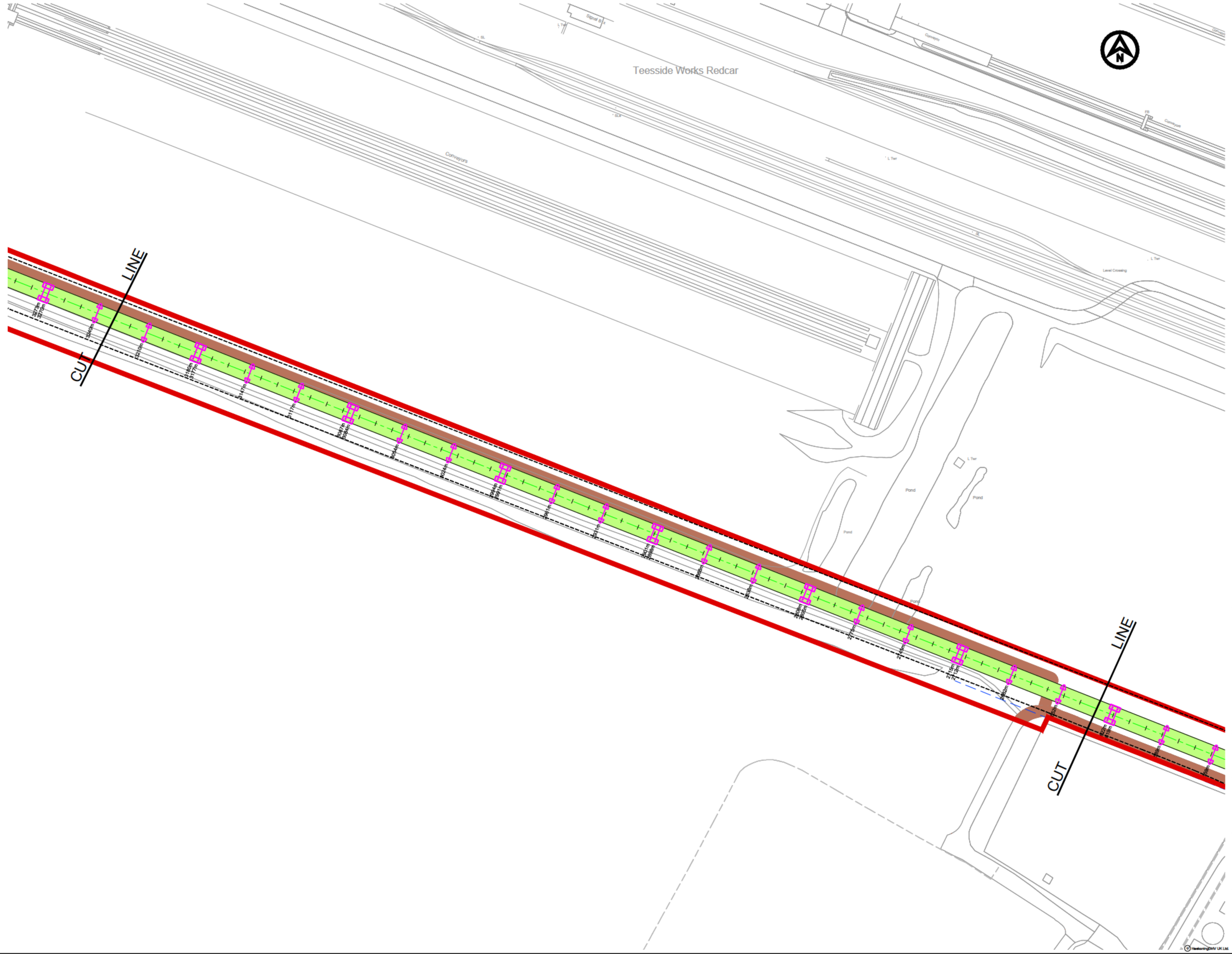
DATE	FEB'15	CLIENT S REF.			
SCALE AT A1	1 1000	AUTOCAD REF.	PB1586-SK494		

DRAWING No. PB1586-SK494

REVISION E

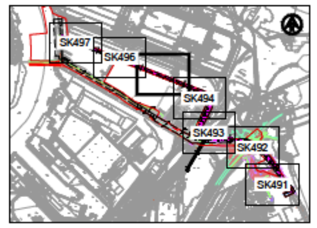
DRG No. PB1586-SK495



NOTES

MAJOR CROSSINGS

MC 0	Eastern Boundary Road	- Pass over in bridge
MC 1	Highway A1085	- Pass over in bridge
MC 2	YPL 1st access road	- Pass over in bridge
MC 3	Hot metal rail	- Pass over in bridge
MC 4	NWL 2nd access road	- Pass over in bridge
MC 5	National power grid lines	- Pass under 10 m clearance
MC 6	SSI road bridge	- Pass over in bridge
MC 7	National rail way	- Pass over in bridge
MC 8	Access NWL W.T.P.	- Pass over in bridge
MC 9	Outfall	- Pass over in bridge



KEY PLAN
SCALE 1:50000

LEGEND - CONVEYOR

- TYPE 3 - OPEN CONVEYOR - 2 LEGS
- TYPE 4 - OVAL ENCLOSED CONVEYOR - 2 LEGS
- TRANSFER TOWER
- ACCESS ROUTES
- CONVEYOR FOOTINGS
- CONVEYOR AT THE QUAY

LEGEND - EXISTING SERVICES

- EASEMENT ZONES
- GAS - BP CATS
- GAS - GDF SUEZ
- GAS - RWE
- FIBRE OPTIC CABLE
- MISC - DRAINS, CABLES, DUCTS
- FOUL WATER - SEMBCORP
- WATER - NWL
- GAS - ABANDONED
- ABOVEGROUND PIPELINE CORRIDOR
- OVERHEAD POWER CABLES
- CONVEYOR LATERAL LIMITS OF DEVIATION

REV	DATE	DESCRIPTION	BY	CHK	APP
E	9 03 5	PLANNING ISSUE	LW	DGB	MH
D	6 03 5	MINOR REV SIONS	CH	DGB	MH
C	03 5	MINOR REV SIONS	LW	DGB	MH
B	05 03 5	ISSUED FOR APPROVAL	TF	DGB	MH
A	27 02 5	F RST ISSUE	LW	DGB	RWP

REVISIONS

YORKPOTASH
A Sirius Minerals Project

PROJECT
YORK POTASH

TITLE
THE YORK POTASH
HARBOUR FACILIT ES ORDER 201X
CONVEYOR ROUTE PLANS
NORTHERN ROUTE - SHEET 5
REGULATION 5(2)(o) DOCUMENT 3 3M

Royal HaskoningDHV
HASKONINGDHV UK LTD
MARITIME & WATERWAYS

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DATE	FEB'15	CLIENT'S REF.			
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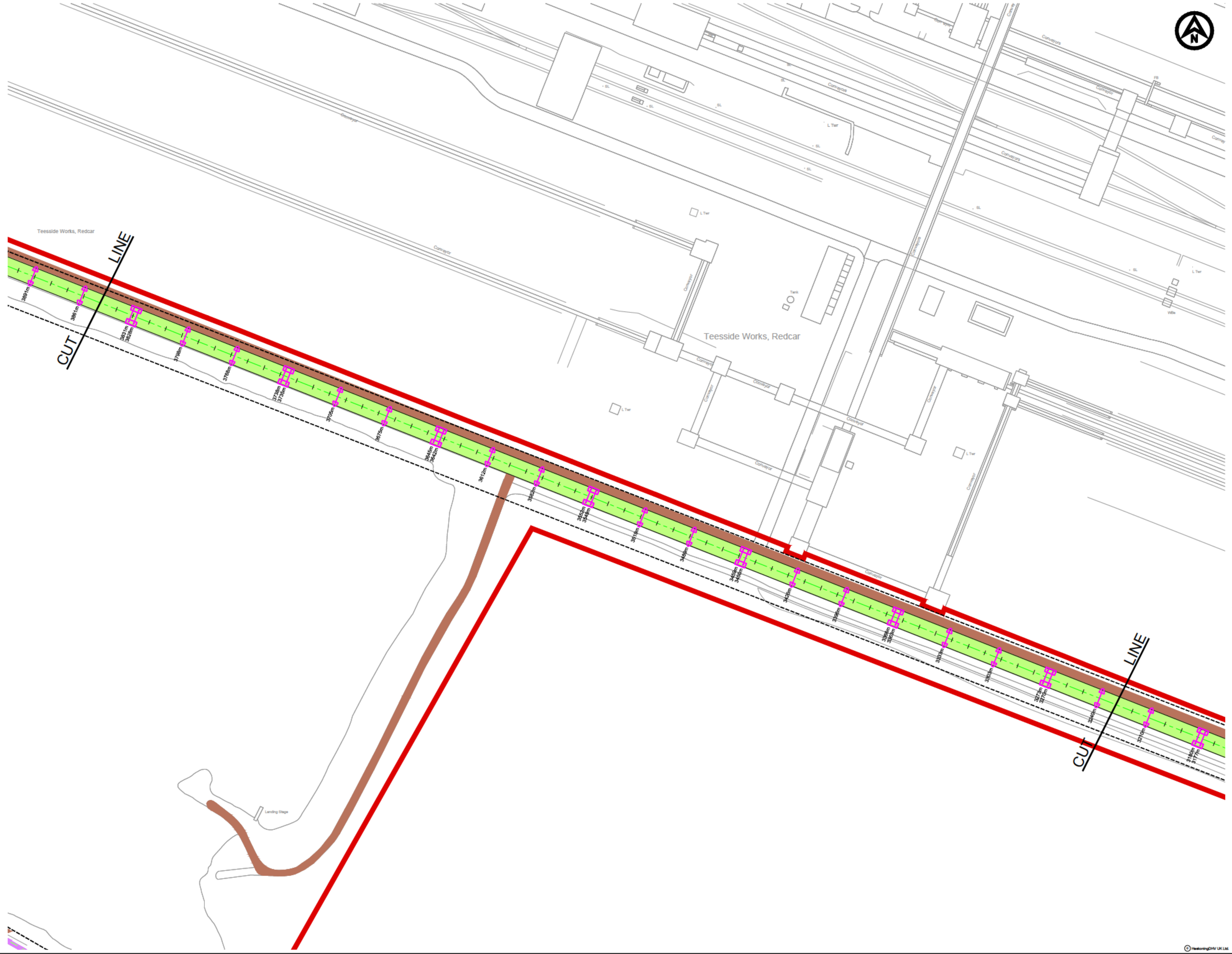
DRAWING No. PB1586-SK495 REVISION E

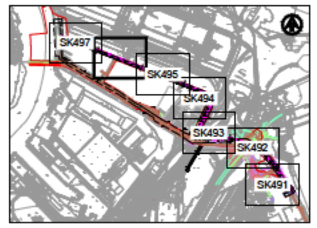
DRG No. PB1586-SK496



NOTES

MAJOR CROSSINGS

MC 0	Eastern Boundary Road	- Pass over in bridge
MC 1	Highway A1085	- Pass over in bridge
MC 2	YPL 1st access road	- Pass over in bridge
MC 3	Hot metal rail	- Pass over in bridge
MC 4	NWL 2nd access road	- Pass over in bridge
MC 5	National power grid lines	- Pass under 10 m clearance
MC 6	SSI road bridge	- Pass over in bridge
MC 7	National rail way	- Pass over in bridge
MC 8	Access NWL W.T.P.	- Pass over in bridge
MC 9	Outfall	- Pass over in bridge



KEY PLAN
SCALE 1 50000

LEGEND - CONVEYOR

- TYPE 3 - OPEN CONVEYOR - 2 LEGS
- TYPE 4 - OVAL ENCLOSED CONVEYOR - 2 LEGS
- TRANSFER TOWER
- ACCESS ROUTES
- CONVEYOR FOOTINGS
- CONVEYOR AT THE QUAY

LEGEND - EXISTING SERVICES

- EASEMENT ZONES
- GAS - BP CATS
- GAS - GDF SUEZ
- GAS - RWE
- FIBRE OPTIC CABLE
- MISC - DRAINS, CABLES, DUCTS
- FOUL WATER - SEMBCORP
- WATER - NWL
- GAS - ABANDONED
- ABOVEGROUND PIPELINE CORRIDOR
- OVERHEAD POWER CABLES
- CONVEYOR LATERAL LIMITS OF DEVIATION

REV	DATE	DESCRIPTION	BY	CHK	APP
E	9 03 5	PLANNING ISSUE	LW	DGB	MH
D	6 03 5	MINOR REV SIONS	CH	DGB	MH
C	03 5	MINOR REV SIONS	LW	DGB	MH
B	05 03 5	ISSUED FOR APPROVAL	TF	DGB	MH
A	27 02- 5	F RST ISSUE	LW	DGB	RWP

REVISIONS

YORKPOTASH
A Sirius Minerals Project

PROJECT
YORK POTASH

TITLE
THE YORK POTASH
HARBOUR FACILIT ES ORDER 201X
CONVEYOR ROUTE PLANS
NORTHERN ROUTE - SHEET 6
REGULATION 5(2)(o) DOCUMENT 3.3N

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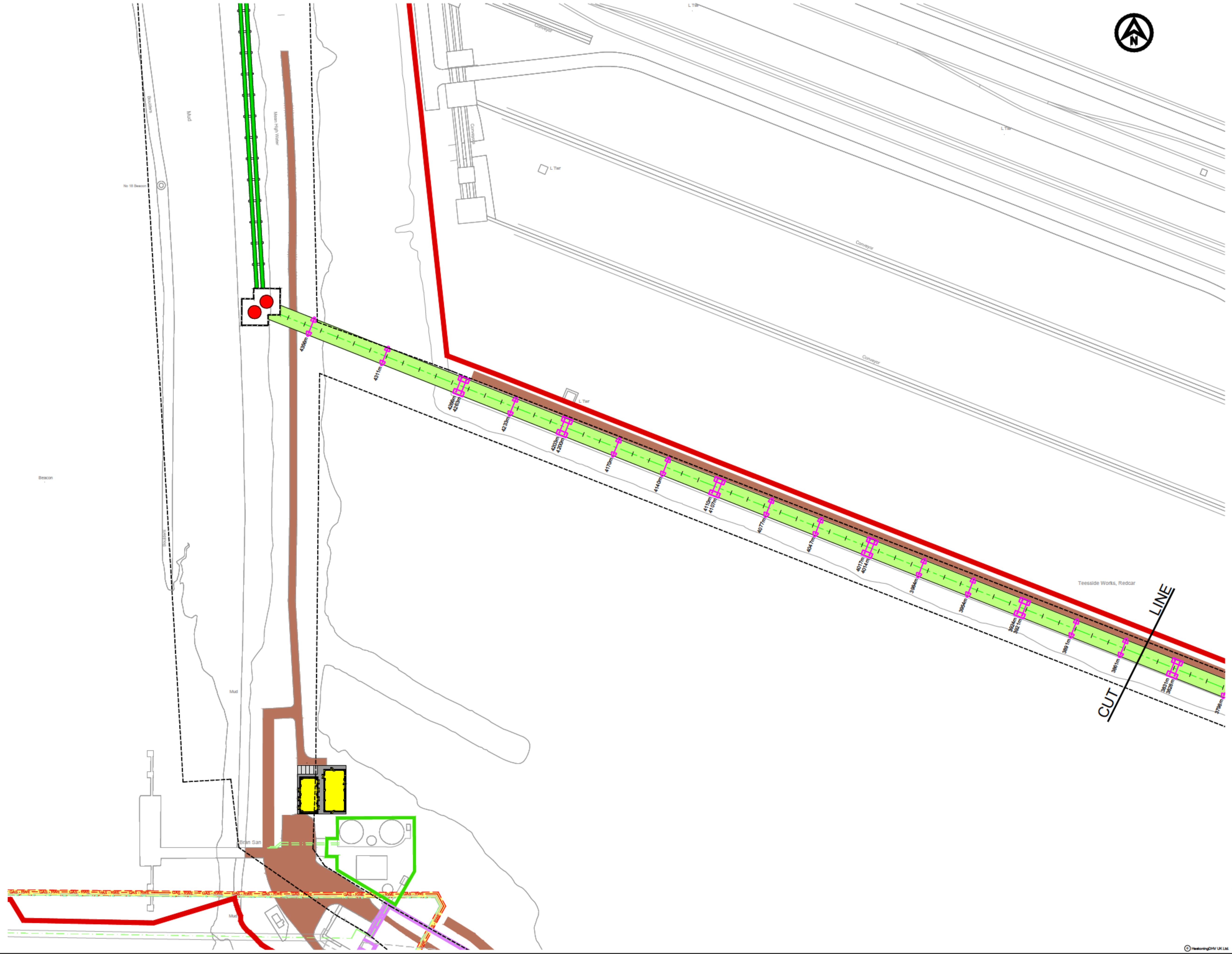
DRAWING No. PB1586-SK496
REVISION E

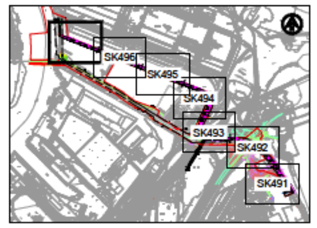
DRG No. PB1586-SK497



NOTES

MAJOR CROSSINGS

MC 0	Eastern Boundary Road	- Pass over in bridge
MC 1	Highway A1085	- Pass over in bridge
MC 2	YPL 1st access road	- Pass over in bridge
MC 3	Hot metal rail	- Pass over in bridge
MC 4	NWL 2nd access road	- Pass over in bridge
MC 5	National power grid lines	- Pass under 10 m clearance
MC 6	SSI road bridge	- Pass over in bridge
MC 7	National rail way	- Pass over in bridge
MC 8	Access NWL W.T.P.	- Pass over in bridge
MC 9	Outfall	- Pass over in bridge



KEY PLAN

SCALE 1 50000

LEGEND - CONVEYOR

- TYPE 3 - OPEN CONVEYOR - 2 LEGS
- TYPE 4 - OVAL ENCLOSED CONVEYOR - 2 LEGS
- TRANSFER TOWER
- ACCESS ROUTES
- CONVEYOR FOOTINGS
- CONVEYOR AT THE QUAY

LEGEND - EXISTING SERVICES

- EASEMENT ZONES
- GAS - BP CATS
- GAS - GDF SUEZ
- GAS - RWE
- FIBRE OPTIC CABLE
- MISC - DRAINS, CABLES, DUCTS
- FOUL WATER - SEMBCORP
- WATER - NWL
- GAS - ABANDONED
- ABOVEGROUND P PELINE CORRIDOR
- OVERHEAD POWER CABLES
- CONVEYOR LATERAL LIMITS OF DEVIATION

REV	DATE	DESCRIPTION	BY	CHK	APP
E	9 03 5	PLANNING ISSUE	LW	DGB	MH
D	6 03 5	MINOR REV SIONS	CH	DGB	MH
C	03 5	MINOR REV SIONS	LW	DGB	MH
B	05 03 5	ISSUED FOR APPROVAL	TF	DGB	MH
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REVISIONS

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A Sirius Minerals Project

PROJECT

YORK POTASH

TITLE

THE YORK POTASH
HARBOUR FACILIT ES ORDER 201X
CONVEYOR ROUTE PLANS
NORTHERN ROUTE - SHEET 7
REGULATION 5(2)(o) DOCUMENT 3.3O

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SCALE AT A1	1 1000	AUTOCAD REF.	PB1586-SK497		

DRAWING No. PB1586-SK497

REVISION E

DRG No. PB1586-SK1040

NOTES

REV	DATE	DESCRIPTION	BY	CHK	APP
E	9 03 5	ISSUED FOR INFORMATION	SA	DGB	DGB
D	6 03 5	MINOR REVISIONS	CH	DGB	MH
C	2 03 5	MINOR REVISIONS	LW	DGB	MH
B	05 03 5	ISSUED FOR INFORMATION	TF	DGB	MH
A	03 03 5	ISSUED FOR INFORMATION	LW	DGB	SM

REVISIONS

YORKPOTASH
A Sirius Minerals Project

PROJECT

YORK POTASH

TITLE

THE YORK POTASH
HARBOUR FACILIT ES ORDER 201X
CONVEYOR ROUTE
SOUTHERN ROUTE - KEY PLAN
REGULATION 5(2)(o) DOCUMENT 3.3A

Royal HaskoningDHV

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DATE JAN'15	CLIENT S REF.	
SCALE AT A1 NTS	AUTOCAD REF. PB1586-SK1040	

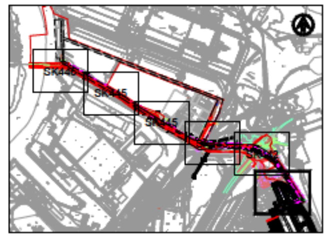
DRAW NG No. PB1586-SK1040 | REVISION E

DRG No. PB1586-SK1041

NOTES

MAJOR CROSSINGS

MC 0	Eastern Boundary Road	- Pass over in bridge
MC 1	Highway A1085	- Pass over in bridge
MC 2	YPL 1st access road	- Pass over in bridge
MC 3	Hot metal rail	- Pass over in bridge
MC 4	NWL 2nd access road	- Pass over in bridge
MC 5	National power grid lines	- Pass under 10 m clearance
MC 6	SSI road bridge	- Pass over in bridge
MC 7	National rail way	- Pass over in bridge
MC 8	Access NWL W.T.P.	- Pass over in bridge
MC 9	Outfall	- Pass over in bridge



KEY PLAN

SCALE 1 50000

LEGEND - CONVEYOR

- TYPE 3 - OPEN CONVEYOR - 2 LEGS
- TYPE 4 - OVAL ENCLOSED CONVEYOR - 2 LEGS
- TRANSFER TOWER
- ACCESS ROADS
- CONVEYOR FOOTINGS
- CONVEYOR AT THE QUAY

LEGEND - EXISTING SERVICES

- EASEMENT ZONES
- GAS - BP CATS
- GAS - GDF SUEZ
- GAS - RWE
- FIBRE OPTIC CABLE
- MISC - DRAINS, CABLES, DUCTS
- FOUL WATER - SEMBCORP
- WATER - NWL
- GAS - ABANDONED
- ABOVEGROUND PIPELINE CORRIDOR
- OVERHEAD POWER CABLES
- CONVEYOR LIMITS OF DEVIATION

REV	DATE	DESCRIPTION	BY	CHK	APP
E	9 03 5	PLANNING ISSUE	LW	DGB	MH
D	6 03 5	MINOR REVISIONS	CH	DGB	MH
C	2 03 5	MINOR REVISIONS	LW	DGB	MH
B	05 03 5	ISSUED FOR INFORMATION	TF	DGB	MH
A	03-03- 5	ISSUED FOR INFORMATION	LW	DGB	SM

REVISIONS

YORKPOTASH
A Sirius Minerals Project

PROJECT

YORK POTASH

TITLE

THE YORK POTASH
HARBOUR FAC LITIES ORDER 201X
CONVEYOR ROUTE PLANS
SOUTHERN ROUTE - SHEET 1
REGULATION 5(2)(o) DOCUMENT 3.3B

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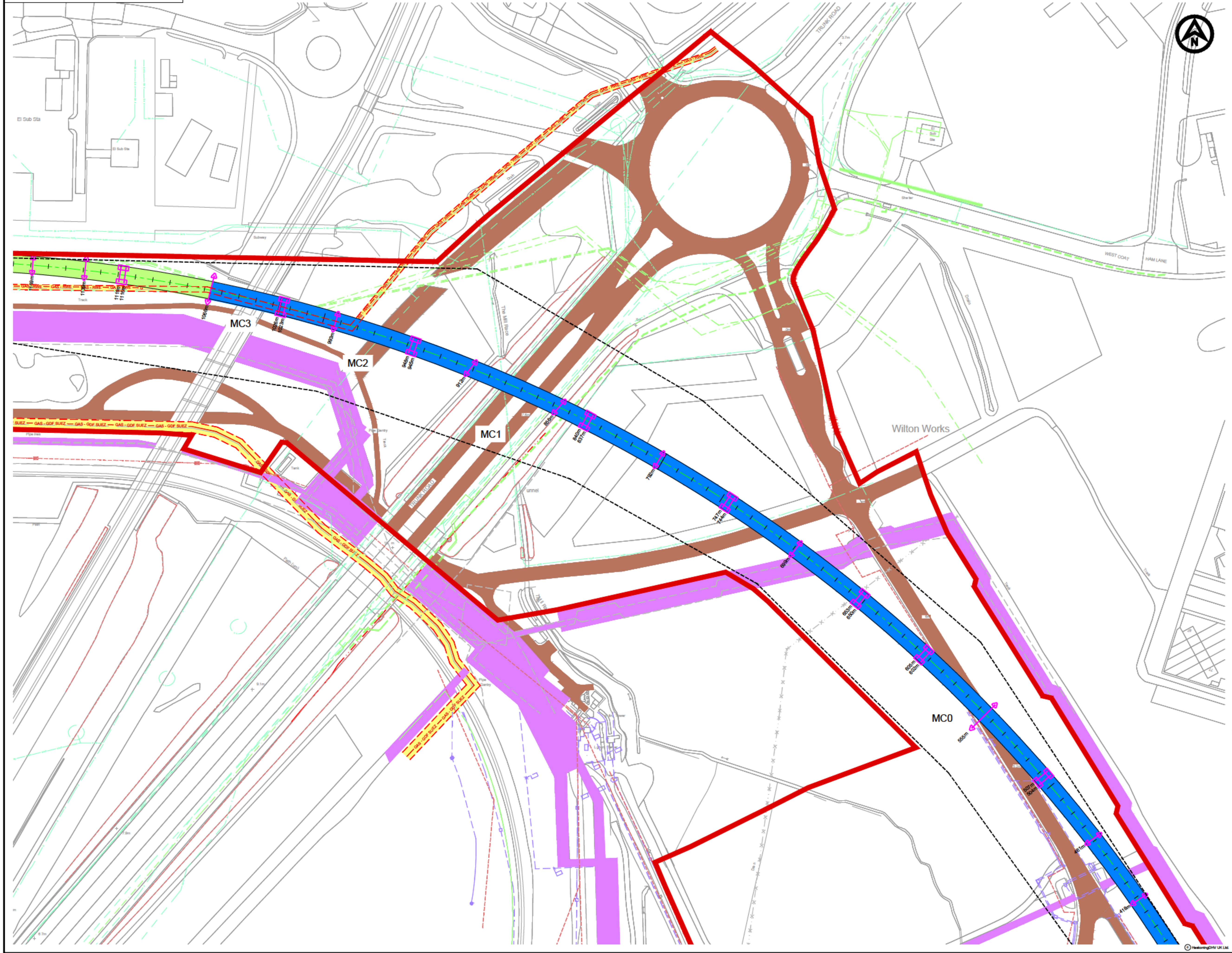
DRAWN	LW	CHECKED	DGB	PASSED	SM
DATE	JAN'15	CLIENT'S REF.			
SCALE AT A1	1 1000	AUTOCAD REF.	PB1586-SK1041		

DRAWING No. PB1586-SK1041

REVISION E

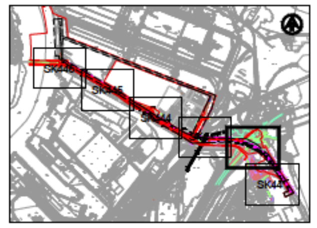
DRG No. PB1586-SK1042



NOTES

MAJOR CROSSINGS

MC 0	Eastern Boundary Road	- Pass over in bridge
MC 1	Highway A1085	- Pass over in bridge
MC 2	YPL 1st access road	- Pass over in bridge
MC 3	Hot metal rail	- Pass over in bridge
MC 4	NWL 2nd access road	- Pass over in bridge
MC 5	National power grid lines	- Pass under 10 m clearance
MC 6	SSI road bridge	- Pass over in bridge
MC 7	National rail way	- Pass over in bridge
MC 8	Access NWL W.T.P.	- Pass over in bridge
MC 9	Outfall	- Pass over in bridge



KEY PLAN

SCALE 1 50000

LEGEND - CONVEYOR

- TYPE 3 - OPEN CONVEYOR - 2 LEGS
- TYPE 4 - OVAL ENCLOSED CONVEYOR - 2 LEGS
- TRANSFER TOWER
- ACCESS ROADS
- CONVEYOR FOOTINGS
- CONVEYOR AT THE QUAY

LEGEND - EXISTING SERVICES

- EASEMENT ZONES
- GAS - BP CATS
- GAS - GDF SUEZ
- GAS - RWE
- FIBRE OPTIC CABLE
- MISC - DRAINS, CABLES, DUCTS
- FOUL WATER - SEMBCORP
- WATER - NWL
- GAS - ABANDONED
- ABOVEGROUND PIPELINE CORRIDOR
- OVERHEAD POWER CABLES
- CONVEYOR LIMITS OF DEVIATION

REV	DATE	DESCRIPTION	BY	CHK	APP
E	[illegible]	PLANNING ISSUE	LW	DGB	MH
D	[illegible]	MINOR REV SIONS	CH	DGB	MH
C	[illegible]	MINOR REV SIONS	LW	DGB	MH
B	[illegible]	ISSUED FOR INFORMATION	TF	DGB	MH
A	[illegible]	ISSUED FOR INFORMATION	LW	DGB	SM

REVISIONS

YORKPOTASH
A Sirius Minerals Project

PROJECT

YORK POTASH

TITLE

THE YORK POTASH
HARBOUR FACILIT ES ORDER 201X
CONVEYOR ROUTE PLANS
SOUTHERN ROUTE - SHEET 2
REGULATION 5(2)(o) DOCUMENT 3.3C

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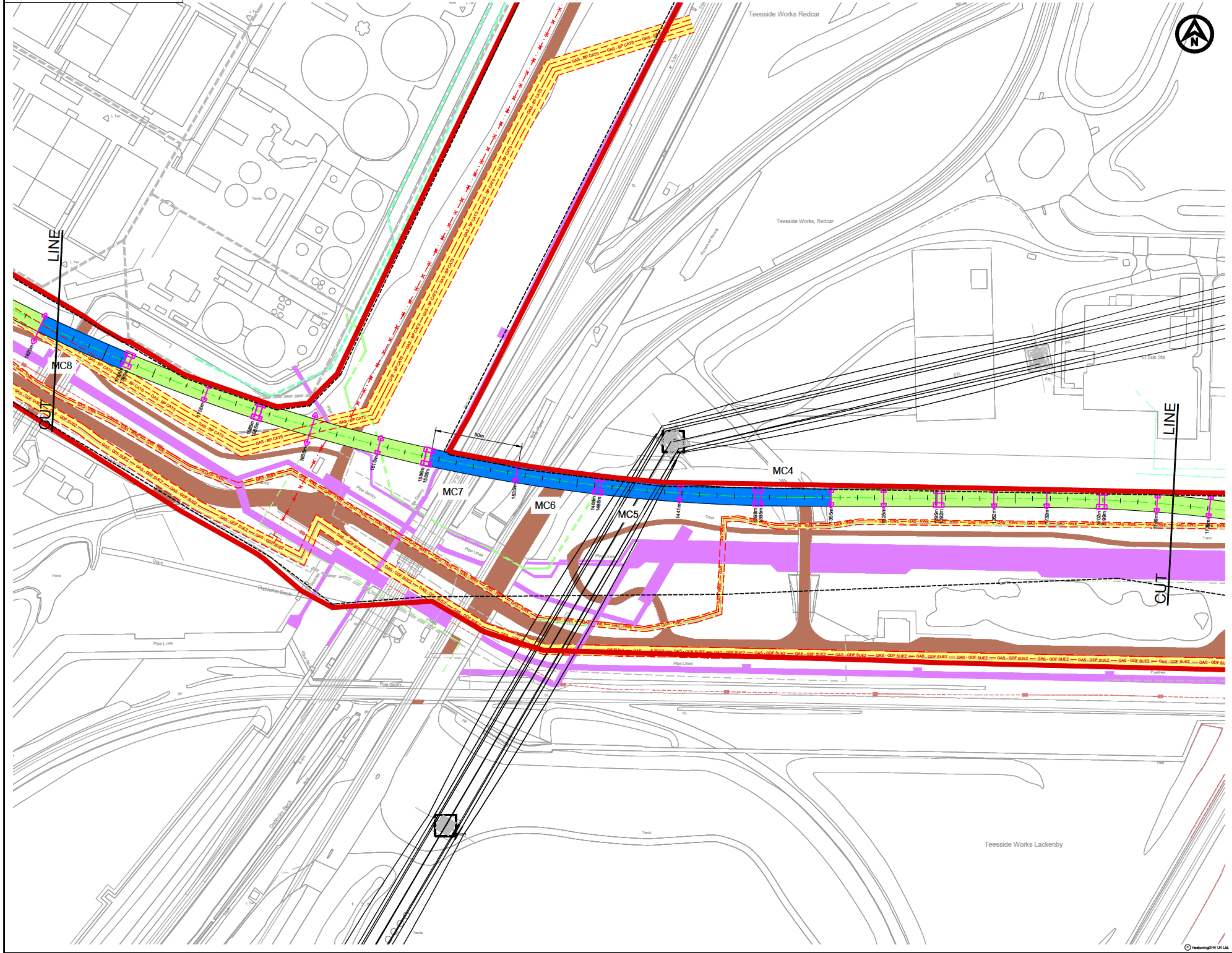
DATE	JAN'15	CLIENT S REF.			
SCALE AT A1	1 1000	AUTOCAD REF.	PB1586-SK1042		

DRAWING No. PB1586-SK1042

REVISION E

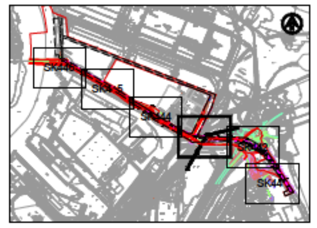
DRG No. PB1586-SK1043



NOTES

MAJOR CROSSINGS

MC 0	Eastern Boundary Road	- Pass over in bridge
MC 1	Highway A1085	- Pass over in bridge
MC 2	YPL 1st access road	- Pass over in bridge
MC 3	Hot metal rail	- Pass over in bridge
MC 4	NWL 2nd access road	- Pass over in bridge
MC 5	National power grid lines	- Pass under 10 m clearance
MC 6	SSI road bridge	- Pass over in bridge
MC 7	National rail way	- Pass over in bridge
MC 8	Access NWL W.T.P.	- Pass over in bridge
MC 9	Outfall	- Pass over in bridge



KEY PLAN
SCALE 1 50000

LEGEND - CONVEYOR

- TYPE 3 - OPEN CONVEYOR - 2 LEGS
- TYPE 4 - OVAL ENCLOSED CONVEYOR - 2 LEGS
- TRANSFER TOWER
- ACCESS ROADS
- CONVEYOR FOOTINGS
- CONVEYOR AT THE QUAY

LEGEND - EXISTING SERVICES

- EASEMENT ZONES
- GAS - BP CATS
- GAS - GDF SUEZ
- GAS - RWE
- FIBRE OPTIC CABLE
- MISC - DRAINS, CABLES, DUCTS
- FOUL WATER - SEMBCORP
- WATER - NWL
- GAS - ABANDONED
- ABOVEGROUND PIPELINE CORRIDOR
- OVERHEAD POWER CABLES
- CONVEYOR LIMITS OF DEVIATION

REVISIONS

REV	DATE	DESCRIPTION	BY	CHK	APP
E	9 03 5	PLANNING ISSUE	LW	DGB	MH
D	6 03 5	MINOR REV SIONS	CH	DGB	MH
C	03 5	MINOR REV SIONS	LW	DGB	MH
B	05 03 5	ISSUED FOR INFORMATION	TF	DGB	MH
A	03 03 5	ISSUED FOR INFORMATION	LW	DGB	SM

YORKPOTASH
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PROJECT
YORK POTASH

TITLE
THE YORK POTASH
HARBOUR FACILIT ES ORDER 201X
CONVEYOR ROUTE PLANS
SOUTHERN ROUTE - SHEET 3
REGULATION 5(2)(o) DOCUMENT 3.3D

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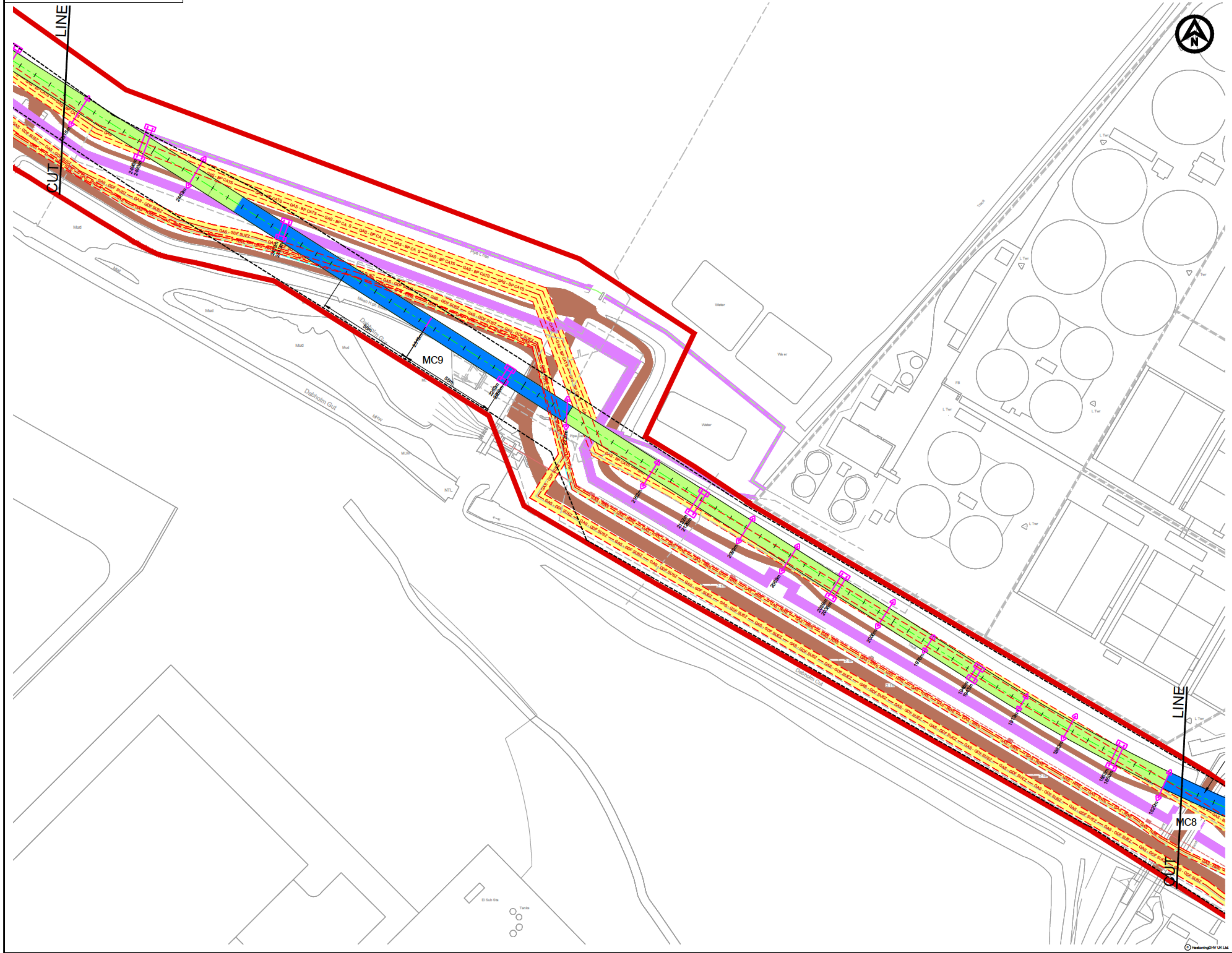
DATE	JAN'15	CLIENT S REF.			
SCALE AT A1	1 1000	AUTOCAD REF.	PB1586-SK1043		

DRAWING No. PB1586-SK1043

REVISION E

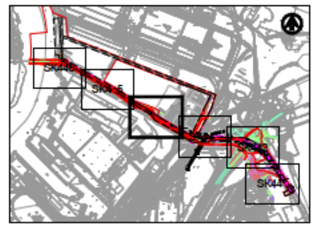
DRG No. PB1586-SK1044



NOTES

MAJOR CROSSINGS

MC 0	Eastern Boundary Road	- Pass over in bridge
MC 1	Highway A1085	- Pass over in bridge
MC 2	YPL 1st access road	- Pass over in bridge
MC 3	Hot metal rail	- Pass over in bridge
MC 4	NWL 2nd access road	- Pass over in bridge
MC 5	National power grid lines	- Pass under 10 m clearance
MC 6	SSI road bridge	- Pass over in bridge
MC 7	National rail way	- Pass over in bridge
MC 8	Access NWL W.T.P.	- Pass over in bridge
MC 9	Outfall	- Pass over in bridge



KEY PLAN
SCALE 1 50000

LEGEND - CONVEYOR

- TYPE 3 - OPEN CONVEYOR - 2 LEGS
- TYPE 4 - OVAL ENCLOSED CONVEYOR - 2 LEGS
- TRANSFER TOWER
- ACCESS ROADS
- CONVEYOR FOOTINGS
- CONVEYOR AT THE QUAY

LEGEND - EXIST NG SERVICES

- EASEMENT ZONES
- GAS - BP CATS
- GAS - GDF SUEZ
- GAS - RWE
- FIBRE OPTIC CABLE
- MISC - DRAINS, CABLES, DUCTS
- FOUL WATER - SEMBCORP
- WATER - NWL
- GAS - ABANDONED
- ABOVEGROUND PIPELINE CORRIDOR
- OVERHEAD POWER CABLES
- CONVEYOR LIMITS OF DEVIATION

REV	DATE	DESCRIPTION	BY	CHK	APP
E	9 03 5	PLANNING ISSUE	LW	DGB	MH
D	6 03 5	MINOR REV SIONS	CH	DGB	MH
C	03 5	MINOR REV SIONS	LW	DGB	MH
B	05 03 5	ISSUED FOR INFORMATION	TF	DGB	MH
A	03 03- 5	ISSUED FOR INFORMATION	LW	DGB	SM

REVISIONS

YORKPOTASH
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PROJECT
YORK POTASH

TITLE
THE YORK POTASH
HARBOUR FACILIT ES ORDER 201X
CONVEYOR ROUTE PLANS
SOUTHERN ROUTE - SHEET 4
REGULATION 5(2)(o) DOCUMENT 3 3E

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DATE	JAN'15	CLIENT S REF.			
SCALE AT A1	1 1000	AUTOCAD REF.	PB1586-SK1044		

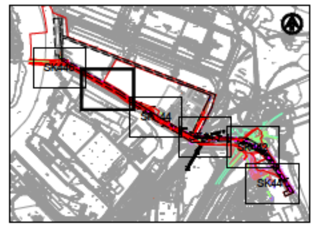
DRAWING No. PB1586-SK1044 REVISION E

DRG No. PB1586-SK1045

NOTES

MAJOR CROSSINGS

MC 0	Eastern Boundary Road	- Pass over in bridge
MC 1	Highway A1085	- Pass over in bridge
MC 2	YPL 1st access road	- Pass over in bridge
MC 3	Hot metal rail	- Pass over in bridge
MC 4	NWL 2nd access road	- Pass over in bridge
MC 5	National power grid lines	- Pass under 10 m clearance
MC 6	SSI road bridge	- Pass over in bridge
MC 7	National rail way	- Pass over in bridge
MC 8	Access NWL W.T.P.	- Pass over in bridge
MC 9	Outfall	- Pass over in bridge



KEY PLAN

SCALE 1 50000

LEGEND - CONVEYOR

- TYPE 3 - OPEN CONVEYOR - 2 LEGS
- TYPE 4 - OVAL ENCLOSED CONVEYOR - 2 LEGS
- TRANSFER TOWER
- ACCESS ROADS
- CONVEYOR FOOTINGS
- CONVEYOR AT THE QUAY

LEGEND - EXISTING SERVICES

- EASEMENT ZONES
- GAS - BP CATS
- GAS - GDF SUEZ
- GAS - RWE
- FIBRE OPTIC CABLE
- MISC - DRAINS, CABLES, DUCTS
- FOUL WATER - SEMBCORP
- WATER - NWL
- GAS - ABANDONED
- ABOVEGROUND PIPELINE CORRIDOR
- OVERHEAD POWER CABLES
- CONVEYOR LIMITS OF DEVIATION

REV	DATE	DESCRIPTION	BY	CHK	APP
E	[illegible]	PLANNING ISSUE	LW	DGB	MH
D	[illegible]	MINOR REV SIONS	CH	DGB	MH
C	[illegible]	MINOR REV SIONS	LW	DGB	MH
B	[illegible]	ISSUED FOR INFORMATION	TF	DGB	MH
A	[illegible]	ISSUED FOR INFORMATION	LW	DGB	SM

REVISIONS

YORKPOTASH
A Sirius Minerals Project

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YORK POTASH

TITLE

THE YORK POTASH
HARBOUR FACILIT ES ORDER 201X
CONVEYOR ROUTE PLANS
SOUTHERN ROUTE - SHEET 5
REGULATION 5(2)(o) DOCUMENT 3 3F

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DRAWING No. PB1586-SK1045

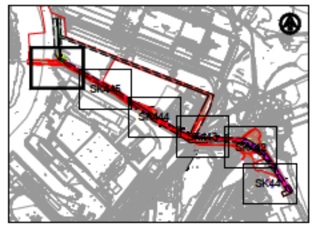
REVISION E

DRG No. PB1586-SK1046

NOTES

MAJOR CROSSINGS

MC 0	Eastern Boundary Road	- Pass over in bridge
MC 1	Highway A1085	- Pass over in bridge
MC 2	YPL 1st access road	- Pass over in bridge
MC 3	Hot metal rail	- Pass over in bridge
MC 4	NWL 2nd access road	- Pass over in bridge
MC 5	National power grid lines	- Pass under 10 m clearance
MC 6	SSI road bridge	- Pass over in bridge
MC 7	National rail way	- Pass over in bridge
MC 8	Access NWL W.T.P.	- Pass over in bridge
MC 9	Outfall	- Pass over in bridge



KEY PLAN

SCALE 1 50000

LEGEND - CONVEYOR

- TYPE 3 - OPEN CONVEYOR - 2 LEGS
- TYPE 4 - OVAL ENCLOSED CONVEYOR - 2 LEGS
- SURGE BINS
- ACCESS ROADS
- EXISTING BUILDING

LEGEND - EXISTING SERVICES

- EASEMENT ZONES
- GAS - BP CATS
- GAS - GDF SUEZ
- GAS - RWE
- FIBRE OPTIC CABLE
- MISC - DRAINS, CABLES, DUCTS
- FOUL WATER - SEMBCORP
- WATER - NWL
- GAS - ABANDONED
- ABOVEGROUND PIPELINE CORRIDOR
- OVERHEAD POWER CABLES
- CONVEYOR FOOTINGS
- CONVEYOR AT THE QUAY
- CONVEYOR LIMITS OF DEVIATION

REV	DATE	DESCRIPTION	BY	CHK	APP
E	9 03 5	PLANNING ISSUE	LW	DGB	MH
D	6 03 5	MINOR REV SIONS	CH	DGB	MH
C	3 03 5	MINOR REV SIONS	LW	DGB	MH
B	05 03 5	ISSUED FOR INFORMATION	TF	DGB	MH
A	03 02 5	ISSUED FOR INFORMATION	LW	DGB	SM

REVISIONS

YORKPOTASH
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PROJECT

YORK POTASH

TITLE

THE YORK POTASH
HARBOUR FACILIT ES ORDER 201X
CONVEYOR ROUTE PLANS
SOUTHERN ROUTE - SHEET 6
REGULATION 5(2)(o) DOCUMENT 3.3G

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DATE JAN'15	CLIENT S REF.	
SCALE AT A1 1 1000	AUTOCAD REF. PB1586-SK1045	

DRAWING No. PB1586-SK1046 REVISION E