



Design Report

Woy Woy Waste Management Facility (WMF) – Eastern Platform Project

Central Coast Council (NSW)

20 May 2025

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GHD Pty Ltd | ABN 39 008 488 373

Contact: Scott Farrell, Technical Director - Roads and Project Management | GHD
 GHD Tower, Level 3, 24 Honeysuckle Drive
 Newcastle, New South Wales 2300, Australia
 T +61 2 4979 9999 | F +61 2 9475 0725 | E ntlmail@ghd.com | ghd.com

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1. Introduction

Central Coast Council (Council) owns and operates the Woy Woy Waste Management Facility (WMF) at Nagari Road, Woy Woy (refer Figure 3.1). The WMF is the primary waste disposal area for the southern Central Coast community and has operated as a waste facility since 1974. Council is developing a new 'Eastern Platform' to support ongoing WMF operations.

This design report outlines information used as a basis to develop the design of the eastern platform. It includes an overview of the site location, details of design standards used and a summary of the planning pathway and determining authority.

1.1 Background

An area at the southern end of the WMF has been chosen for the next landfilling area. A development application (DA) for the proposed Cell A (DA/12/2024) is currently under assessment and will be determined by the Hunter and Central Coast Planning Panel. Detailed design is also in progress.

The Cell A area is currently used for stockpiling of excavated natural materials (ENM) and other recyclables. Once the South Cell area is developed for landfilling, it will no longer be available for stockpiling or generation of cover material.

1.2 Objectives

The primary objective of this project is to utilise the area to the east of current landfilling operations, referred to as the Eastern Platform area of the site, to support ongoing operations of Woy Woy Waste Management Facility. The main purpose of the Eastern Platform will be to:

- Stockpile excavated natural materials (ENM).
- Stockpile recyclable materials and miscellaneous items for future use/transport.
- Provide a source of cover material for existing and ongoing operations.

1.3 Purpose of this report

The purpose of this report is to document the design basis for the development of the eastern platform at Woy Woy Waste Management Facility design project.

1.4 Limitations

This report: has been prepared by GHD for Central Coast Council (NSW) and may only be used and relied on by Central Coast Council (NSW) for the purpose agreed between GHD and Central Coast Council (NSW) as set out in Section 1.3 of this report.

GHD otherwise disclaims responsibility to any person other than Central Coast Council (NSW) arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

GHD has prepared this report on the basis of information provided by Central Coast Council (NSW) and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. Regulatory requirements and key guidance documents

2.1 Key guidance documents

Key guidance documents considered to develop this design basis include:

- Environment Protection Licence (EPL) 6053¹
- Development consent

In addition, NSW has a comprehensive suite of guidelines relating to the development of landfills, administered by the NSW Environmental Protection Agency (EPA) under the *Protection of the Environment Operations Act 1997* (POEO Act). These include the following:

- NSW EPA (2016). *Environmental Guidelines: Solid Waste Landfills, Second Edition*
- POEO (Waste) Regulation 2014

2.2 EPL 6053

The landfill operates under EPL 6053 issued by the NSW EPA². This EPL authorises the scheduled activities listed below at the premises:

- Resource recovery
- Waste disposal (application to land)
- Waste storage

The total tonnage of waste disposed of at the site must not exceed 100,000 tonnes per annum. The site EPL has the following conditions relevant to this work:

- L2.1 - *Whenever a wet weather overflow is occurring due to a stormwater event greater than or equal to a 1 in 10 year recurrence interval of 24 hour duration storm event, water from the stormwater sedimentation basin(s) is permitted to be discharged for the duration of the overflow.*
- O5.1 - *The sedimentation and leachate dams must be maintained to ensure that their design capacity is available for the storage of stormwater/leachate.*
- O6.13 (c) - *At least two weeks of cover material must be available at the premises under all weather conditions. The material may be won on site, or alternatively a cover stockpile must be maintained adjacent to the tip face.*

¹ Version dated 24 October 2019 at the time of this report

² Version dated 14 September 2021 at the time of this report

2.3 Development consent

In 1994 a legal review of the development consent for the Woy Woy WMF site (Dawson, 1994) found that a consent was obtained from the then Health Commission to use the site as a solid waste disposal depot.

A new development consent is being sought for the South Cell. The project is deemed to be State significant development (SSD) as it is a development for the purposes of an extension to a regional landfill that has capacity to receive more than 650,000 tonnes of putrescible waste over the life of the site and capacity to receive more than 75,000 tonnes per year of putrescible waste. The project therefore requires assessment and approval in accordance with Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) for determination by the NSW Minister for Planning. An environmental impact statement (EIS) is required to be submitted as part of the application for development consent, which is being completed alongside the subsequent design phases.

A formal pre-DA planning meeting was held with Central Coast Council planning staff on 3 October 2024. An outcome of this meeting was provision of minutes from the meeting on 29 November 2024.

In summary, the determination by Council planning staff found that the storage platform is not ancillary, but is an expansion of the existing approved dominant use of the site and would be better defined as an addition to the existing Waste Management Facility. Advice was that because the development is categorised as designated development, the application:

- Must be accompanied by an environmental impact statement (EIS), see s.4.12(8) of the Environmental Planning and Assessment Act 1979.
- Will require public notification for at least 28 days, see Part 1 Mandatory community participation requirements, s.8, of the Environmental Planning and Assessment Act 1979.
- Can be the subject of a merits appeal to the NSW Land and Environment Court by objectors, see s.8.8 of the Environmental Planning and Assessment Act 1979.

GHD subsequently submitted a Request for SEARS (Planning Secretary's Requirements), and the response was received 13 February 2025.

2.4 NSW Landfill Guidelines

The NSW EPA's Environmental Guidelines: Solid Waste Landfills (2016) – henceforth referred to as the NSW Landfill Guidelines – provide guidance for the environmental management of landfills in NSW by specifying a series of 'Minimum Standards'. They involve design and construction techniques, effective site operations, monitoring and reporting protocols, and post-closure management.

2.5 Previous site investigations

Previous site investigations undertaken at the site and considered in the design basis include:

- Biosis, 2022a. Woy Woy Waste Management Facility: Aboriginal Cultural Heritage Assessment.
- Biosis, 2022b. Woy Woy Waste Management Facility: Archaeological Report.
- ERM Mitchell McCotter 1998. Extension to sandstone quarry, Woy Woy: Environmental Impact Statement for Gosford City Council.
- GHD, Jan 2025. Geotechnical Investigations Report.
- Leneco/Fraser Ecological/TreeHouse Ecology (LFT), 2022. Woy Woy Waste Management Facility- Interim Storage and Stockpile Platform, Biodiversity Assessment Development Report.
- SMEC, 2020. Woy Woy Waste Management Facility – Development Strategy Report.

3. Existing site conditions

3.1 Site location and surrounds

The project site is located within the north-east portion of the existing Woy Woy WMF as shown below in Figure 3.1 and Figure 3.2. The WMF is located in the township of Woy Woy, approximately 10 km south of Gosford across Brisbane Water within the Central Coast LGA.

The WMF consists of:

- Lot 110 DP 755251
- Lot 1 DP 126813
- Lot 1 DP 654885

The project site is approximately 4.1 hectares in area and located on the north-east portion of the WMF. It comprises part of Lot 1 DP 126813 and Lot 1 DP654885.

The WMF is operated in accordance with EPL 6053. The EPL permits resource recovery, waste disposal (application to land) and waste storage. EPL 6053 authorises the disposal of up to a total of 100,000 tonnes per year of waste. The current filling rate is about 80,000 to 85,000 tonnes or 105,000 to 110,000 cubic metres per year (SMEC, 2020).

EPL 6053 authorises the disposal of the following waste types:

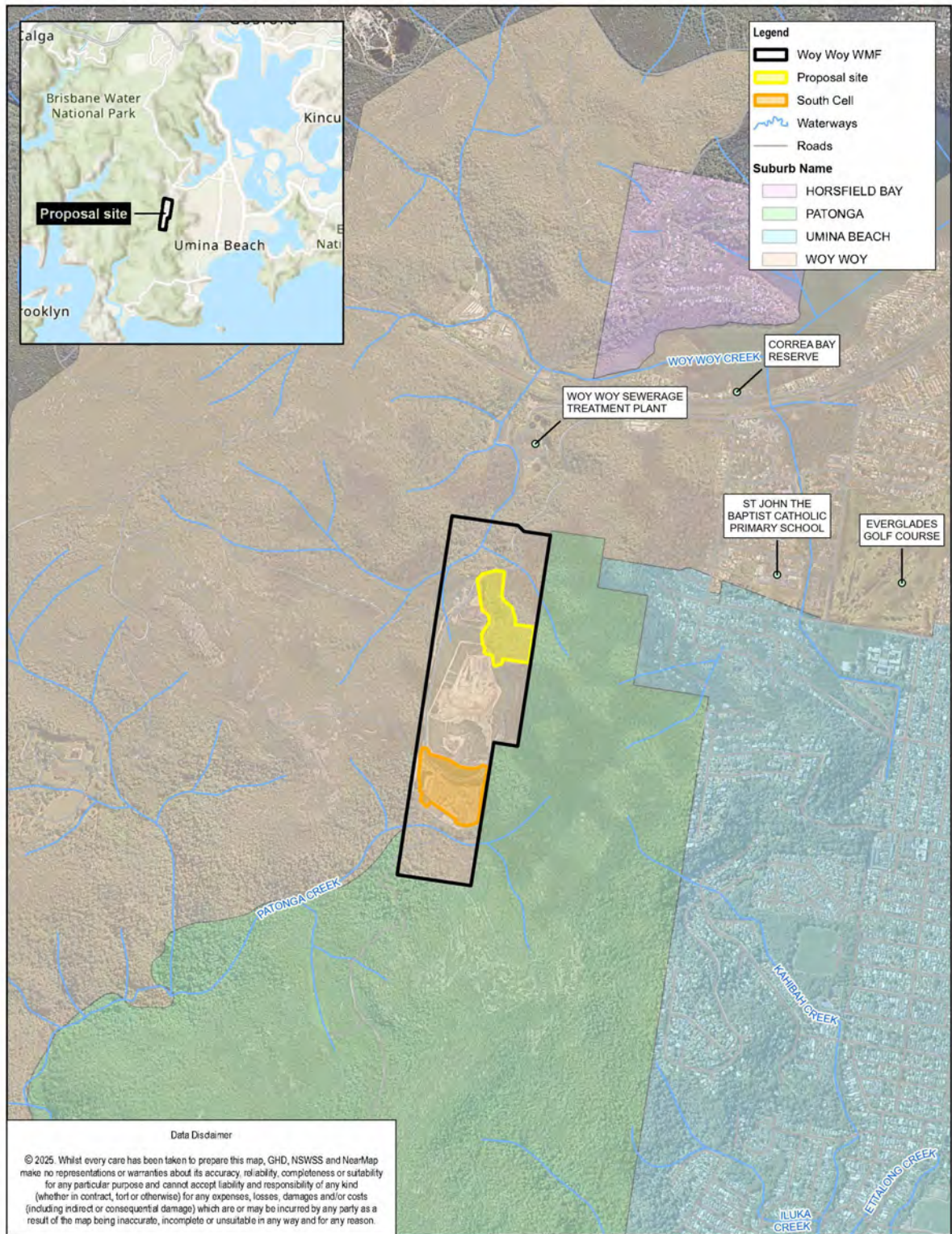
- General solid waste (putrescible)
- General solid waste (non-putrescible)
- Special waste (asbestos waste and waste tyres)

Entry to the WMF is from the north via Nagari Road. All customers enter and exit the site via weighbridges and a gatehouse. An office/waste information room, a carpark and a landfill gas generation unit and flare are located to the south of the gatehouse.

The main areas for waste sorting and disposal are listed below and shown on Figure 3.3.

- **Current active tipping area:** Council's domestic waste contractor and other large operators or those with specialised wastes drop waste directly at the active tipping area.
- **Transfer station:** A transfer bay is located on a completed section of the landfill. The general public and smaller commercial operators drop off waste and recycling to the transfer bay. Dry waste is then sorted to remove scrap metal and transferred to alternative disposal facilities. Recyclable materials are stored in this area until they are collected by the various contractors for further separation and/or recycling off-site. Recyclable materials include concrete, brick and tiles, scrap metal, untreated timber, comingled recyclables, batteries, e-waste, mattresses, motor oil, gas bottles and fluorescent globes.
- **Green waste facility:** The green waste area is located adjacent to the transfer bay. The green waste material is received at the site and then screened, chipped and transferred off-site again. This operation commenced at the site in 2000 and has continued ever since. The green waste facility is operated by Australian Native Landscapes (ANL).
- **Excavation and stockpile area:** South of the transfer station and green waste facility is the excavation and stockpile area. The excavated material is used for building landfill cell walls and covering the waste.

The excavation and stockpile area was previously proposed for an Alternative Waste Treatment (AWT) facility (URS, 2007) however, this area is now proposed to be used for the new South Cell. All other areas of the WMF would continue to operate as they currently do in conjunction with the project.



<p>Paper Size ISO A4</p> <p>0 100 200 300 400 500</p> <p>Metres</p> <p>Map Projection: Transverse Mercator Horizontal Datum: GDA2020 Grid: GDA2020 MGA Zone 56</p>			<p>Central Coast Council Woy Woy WMF Eastern Platform</p>	<p>Project No. 12633195 Revision No. 0 Date 8/05/2025</p>
<p>Proposal site location</p>			<p>FIGURE 3.1</p>	

Light:refghd\AU\Newcastle\Projects\2012633195\GIS\Map\Deliverables\12633195_EIS_TechReport.aprx
Print date: 08 May 2025 - 09:24

Data source: GHD Proposal site boundary (2024), Suburbs, Roads, Waterways, NSWSS 2024, Imagery - Nearmap 2024 World Topographic Map, Esri, TomTom, Garmin, METI/NASA, USGS, World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS, Nearmap WMS Server. Created by: ehenrump

Figure 3.1 Site location



Figure 3.2 Site location within Woy Woy Waste Management Facility

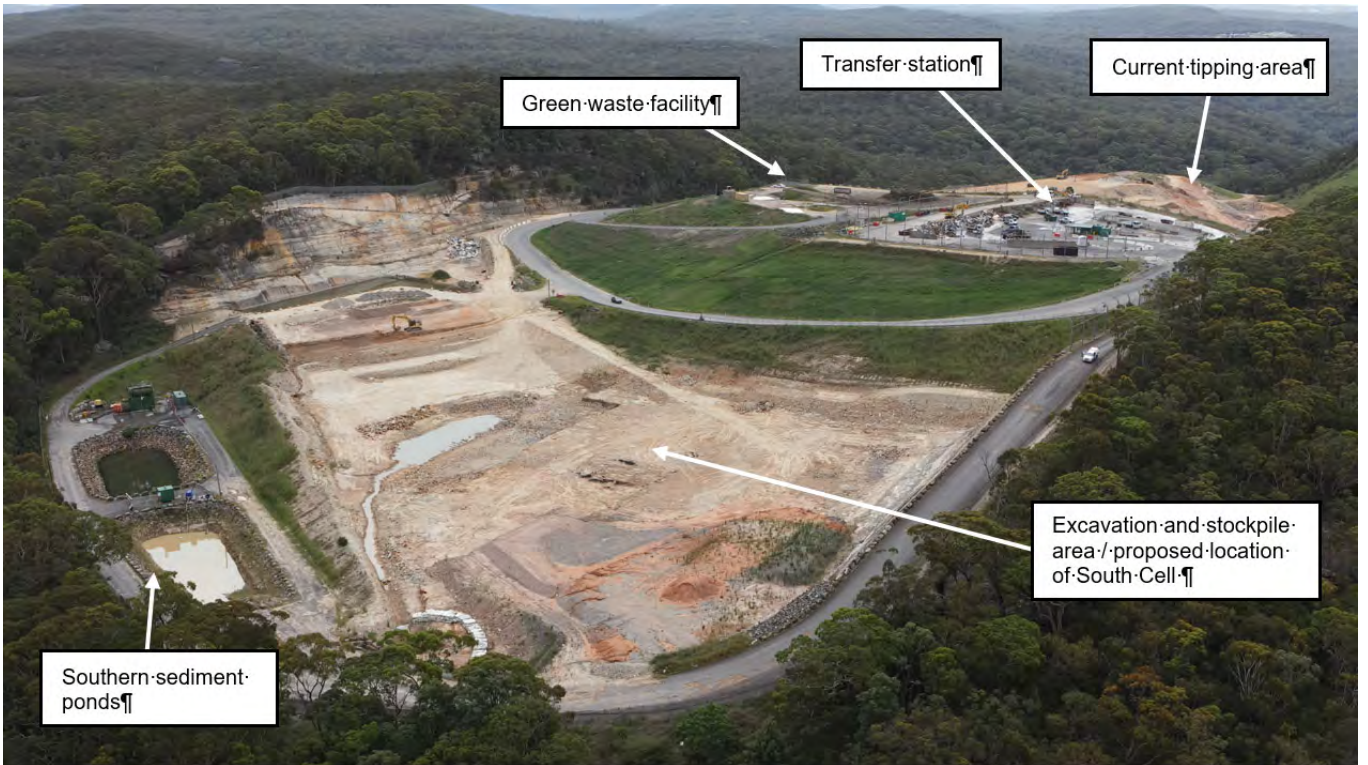


Figure 3.3 Ortho-view showing existing green waste facility, transfer station, current tipping area and current excavation and stockpile area/proposed location of the South Cell

3.1.1 Natural environment

The project site is surrounded to the west, east and south by thick native bush land of the Brisbane Water National Park. The surrounding topography steeply slopes towards the project site.

The project site is about 1.8 km south-west of Brisbane Water and three kilometres northwest of Umina Beach.

Patonga Creek runs to the south of the project site. A couple of recharge tributaries of Woy Woy Creek are located in the northeast area of the WMF. Woy Woy Creek is located about 1.6 kilometres to the north of the project site.

The WMF is mapped as containing Vegetation Category 1 as well as Vegetation Buffer bushfire prone land.

3.1.2 Surrounding land uses

Land use and infrastructure immediately surrounding the project site includes the wider WMF immediately to the north and the Woy Woy STP located more than a kilometre to the north.

Within the locality of the project site are the residential suburbs of Umina Beach, Horsfield Bay and Woy Woy. The nearest residential area is located about 800 m to the east on The Citadel. A natural ridgeline and heavy vegetation provides a physical barrier between the project site and the residential areas to the east.

Recreational facilities within the locality include Correa Bay Reserve located about 1.8 km to the north-east, Dulkara Road Reserve/Park and Everglades Golf Course each about 1.5 km to the north-east of the project site.

The closest school, St John the Baptist Catholic Primary School, is located about 1.3 km to the north-east of the project site.

3.1.3 Zoning

The project site is zoned SP1 Special Activities under *Central Coast Local Environmental Plan 2022*. The accompanying Land Zoning Map identifies the purpose as 'Waste or Resource Management Facility or Resource Management Facility'.

The objectives of the SP1 Special Activities zone are:

- To provide for special land uses that are not provided for in other zones.
- To provide for sites with special natural characteristics that are not provided for in other zones.
- To facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and that minimises any adverse impacts on surrounding land.

In accordance with the zone provisions, waste management facilities are permissible with consent in the SP1 Special Activities (Waste or Resource Management Facility or Resource Management Facility) zone.

3.2 Site history

In 1994 a legal review of the development consent for the Woy Woy WMF site (Dawson, 1994) found the following:

- 1928 – Site used as a quarry.
- 1933 – Part of the site was used for the disposal of night soil.
- 1968 – Gosford Planning Scheme Ordinance zone land 1(b) – extractive industry.
- 1974 – Gosford City Council applied for and obtained the consent of the then Health Commission to use the site as a solid waste disposal depot. The records of a Council meeting on the 19 February 1974 showed that Gosford City Council resolved to accept the conditions on the use of the site imposed by the Health Commission. Public notices were then issued to the community regarding the opening of the waste disposal depot.

In 2012, a decision was made to transport all dry waste off-site to alternate disposal facilities and to landfill only putrescible waste in order to extend the current life of the site.

Central Coast Council was established on 12 May 2016 following the amalgamation of Gosford and Wyong Shire Councils.

In 2020 Council commissioned the 'Woy Woy Waste Management Facility – Development Strategy' (SMEC, 2020) (the 'Development Strategy') to guide the future use and development of the WMF. The Development Strategy identified the existing excavation and stockpile area at the southern end of the Woy Woy WMF site as the location for the next waste cell (known as the new 'South Cell').

3.3 Topography and hydrology

The topography of the Woy Woy Waste Management Facility has been heavily altered from the natural conditions as a result of landfill construction and operations. A large portion of the site has been utilised for landfilling, with a peak at the central area to a height of approximately RL 140 m AHD. The South Cell has been used to date as a borrow pit for the site with excavation well progressed.

The perimeter surface water management system is designed to divert all offsite clean water around the site, maintaining a delineation between site generated runoff and runoff generated from upstream catchments.

Along the eastern edge of the site, a vegetated batter grades towards the active processing area. Runoff from this catchment is captured via a diversion drain at the base of the embankment. Water from this area drains along the east side of the green waste facility towards the north of the site, combining with water collected in the diversion drain from the offsite north-east catchment, and discharging through the same diversion network under the entrance road.

The network of drainage channels within the site area are being progressively extended, with the intention of capturing all water from within the evolving active areas and directing towards either the northern or southern stormwater pond.

Former landfilled areas of the site along the western edge have been grassed and directly runoff towards the channel along the site perimeter. This catchment along with runoff from the sealed road and from the western portion of the BWNP flow through a series of rock check dams before discharging into BWNP.

The former filled areas in the north area are grassed, with stormwater directed towards the north sediment pond. A diversion drain is located upslope of the leachate pond to enable runoff to be directed around this pond and into the stormwater pond.

3.4 Geology and hydrogeology

The site lies within the Triassic aged Hawkesbury Sandstone (Tuth); it is described as medium to coarse grained, massive bedded, cross bedded and horizontally bedded quartz sandstone with minor siltstone. To the northwest of the site, the older Terrigal Formation (Tngt) is exposed beneath the Hawkesbury Sandstone within a gully. It is described as interbedded laminite, shale and sandstone. To the south of the site lies Tertiary aged basalt, dolerite and volcanic breccia intrusions (Mzui_v), which were previously quarried from the site.

Groundwater contours, based on water level monitoring undertaken at the site, show a northerly hydraulic gradient across the majority of the site towards Woy Woy Creek and a hydraulic gradient towards Patonga Creek for the southern area.

3.5 Climate

Precipitation and evaporation climate data for the site was obtained from the Bureau of Meteorology and is presented in Table 3.1. Precipitation data was sourced from Gosford AWS (Station no. 061425), located 6.7 km away from Woy Woy, NSW. Evaporation data was sourced from Peats Ridge (Waratah Road) (Station no. 061351), located 21.4 km away from Woy Woy.

Table 3.1 Local climate data

Time period	Mean monthly rainfall (mm) (Woy Woy Tip, no. 561141) 3	Mean monthly rainfall (mm) (Gosford AWS, no. 061425) 4	Decile 5 (median) rainfall (mm) (Gosford AWS, no. 061425) 5	Mean daily evaporation (mm) (Peats Ridge (Waratah Road), no. 061351) 6	Mean monthly 7 evaporation (mm) (Peats Ridge (Waratah Road), no. 061351)
January	106.2	134.7	111.2	4.6	142.6
February	151.6	154.7	121.5	4.1	114.8
March	186.0	149.9	134.0	3.4	105.4
April	131.1	139.4	96.8	2.6	78.0
May	64.0	118.3	81.0	1.8	55.8
June	130.8	130.5	86.8	1.6	48.0
July	72.8	80.2	53.8	1.7	52.7
August	67.1	72.4	49.0	2.4	74.4
September	70.4	68.5	54.1	3.4	102.0
October	80.3	84.5	61.9	4.0	124.0
November	88.3	91.7	81.8	4.3	129.0
December	83.8	104.2	83.5	4.7	145.7
Annual	1,232.2	1,328.7	1,253.4	3.2	2,340.4

³ Mean rainfall (mm) for years December 2015 to January 2023.

⁴ Mean rainfall (mm) for years 1916 to 2013.

⁵ Decile 5 (median) monthly rainfall (mm) for years 1916 to 2013.

⁶ Mean daily evaporation (mm) for years 1981 to 2012. The station was closed in June 2015.

⁷ Calculated by multiplying daily rainfall by the number of days in that month, 28 days used for February.

4. Design inputs

4.1 Survey

GHD to rely upon the following survey information:

- Detailed survey of the eastern platform area. Provided by Barry Hunt Associates on 03/07/2024 and dated 28/06/2024 in a file named: 57480WOY.dwg.
- Barry Hunt had also provided a project boundary as part of previous work undertaken for Council. During discussions with Council, it has been confirmed that the boundary correctly defines the project area and is shaped as it is in order to avoid and comply with offset requirements from a variety of Aboriginal Heritage and environmentally sensitive areas.

4.2 Development strategy

SMEC prepared the site development strategy in 2020. This document has the project site as East Cell 'A' and East Cell 'B' as shown below in Figure 4.1. In this scenario the project site would have been used as expanded footprint for the landfilling of waste at the site. Cover material was to be won gradually from the development of each of the cells and stockpiling areas changing as suitable land became available.

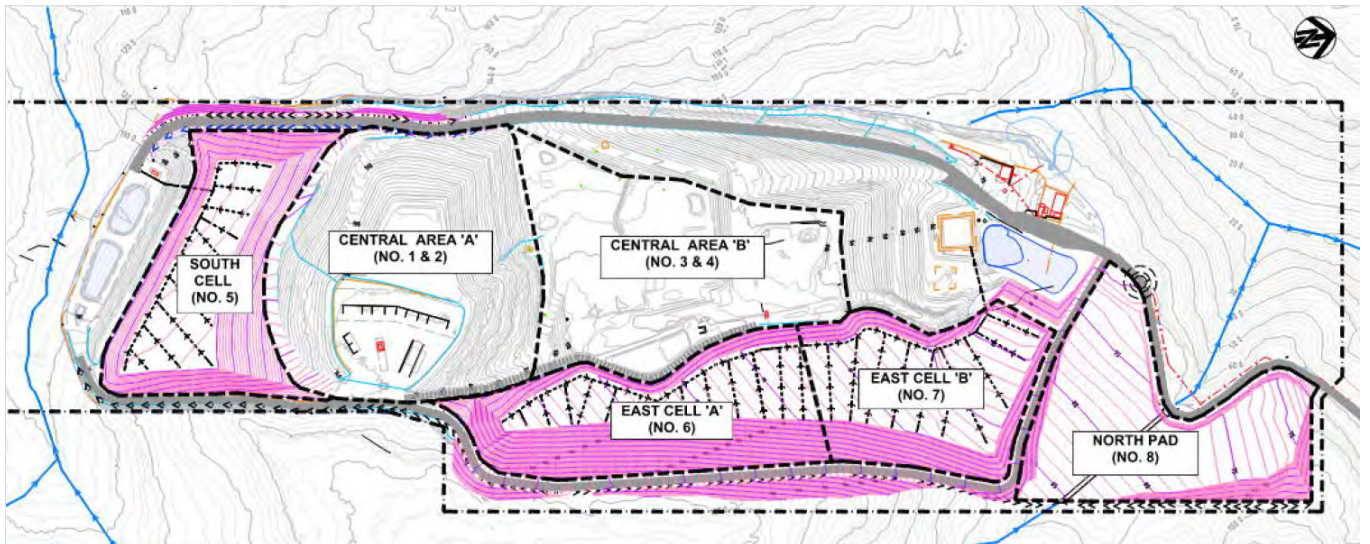


Figure 4.1 Development strategy cell layout (taken from Figure 5.1 SMEC, 2020)

GHD understands that Council has now chosen to not develop the East Cells or the North Pad as was proposed by the development strategy, largely due to heritage and environmental constraints mentioned above. As a result, the site still needs to win cover material and have an area to stockpile materials which is why the project site is being considered.

4.3 Geotechnical investigations

Geotechnical investigations were completed alongside the concept design phase to support the project site design and assessment.

Section 5 of the Geotechnical Investigations Report provides detailed discussion and recommendations. The following summarises the outcomes in relation to the Eastern Platform design and is used to inform design progression.

4.3.1 Recommended slope geometry

Based on the average defect orientations, the following slope profile may be adopted for design:

- 10 m high batter face
- 5 m wide bench
- Batter slopes angles up to 70° (over all wall angle of approximately 55°)
- Any fill batter slopes should be laid back at 2H:1V

4.3.2 Drainage design and maintenance

The design of the excavation walls must include the provision for drainage of surface water away from the open edge of each bench, and around the crest of the slopes. This can be achieved by:

- Installation of a drainage bund around the crest of the excavation to stop all run on water flowing into the floor of the excavation.
- Sloping of benches back into the hillside and then draining the benches to a common point where water can be transferred down the slope over competent rock mass, typically at a location where two pit walls meet or at the location of the entry and exit ramp. It is recommended, where voids or defects are noted, that these bench drains be shotcreted or concreted to prevent surface water ingress.

4.3.3 Preliminary pavement thickness design

The report contemplated two general scenarios, being a sand/rock subgrade; or a clay subgrade regarding the roads which are required for the project, and noting the haulage of material over the life of the project. Preliminary pavement designs are:

Sand/rock subgrade (CBR 10%)

- 100 mm ARRB unsealed wearing-course
- 120 mm Basecourse (DGB20)
- 100 mm Sub-basecourse (DGS40)

Clay subgrade (CBR 4%)

- 100 mm ARRB unsealed wearing-course
- 120 mm Basecourse (DGB20)
- 100 mm Sub-basecourse (DGS40)

The report also provides subgrade preparation notes, which will be incorporated into drawings.

4.4 Operational materials consumption

Excavated materials won at the site are used for a range of operational purposes, including construction of landfill cell walls, bunds and temporary access, as well as for daily and intermediate cover. Council estimates that it consumes approximately 30,000 m³ of site won material for these operational purposes per year, or approximately 30% of the filling rate volume.

4.5 Biodiversity development assessment

Treehouse Ecology undertook a Biodiversity Assessment Report (BDAR) for the proposed development footprint accordance with the Department of Planning, Industry and Environment (DPIE) Biodiversity Assessment Method (BAM, 2020). The Biodiversity Offset Scheme (BOS) applies to the Proposal, as it would require an area clearing of native vegetation that exceeds the BOS area clearing threshold. Due to the findings of the assessment the development footprint was altered to avoid several constraints such as:

- Potential maternity/significant habit caves for threatened Eastern Cave Bat and other microchiropteran bat species.
- Ephemeral drainage lines that provide recorded breeding habitat for the threatened Red-crowned Toadlet (*Pseudophryne australis*).
- Perennial drainage line that provides recorded breeding habitat for the threatened Giant Burrowing Frog (*Heiloperus australiacus*).
- PCT 1641 and 881 that has a limited/restricted distribution in the study area and good quality reptile habitat.

A figure showing the location of constraints and offsets to the proposed development area are included in Appendix A.

The BDAR assessment recommended follow up surveys, and planning advice from Central Coast Council planners has also noted environmental requirements. It is expected that SEARS may also require the same or additional surveys/investigations. These matters will be carried forward as part of project progression.

4.6 Aboriginal heritage and archaeology

Biosis undertook an Aboriginal Cultural Heritage Assessment (ACHA) and an archaeological report for the proposed development footprint. The following sites were identified:

- One surface artefact
- Four rock shelters
- One art site complex
- One area of moderate archaeological potential for grinding grooves

This was in addition to an art (pigment) site and an artefact that were previously identified by ERM Mitchell McCotter (1998). A figure showing the findings and offsets is provided in Appendix A.

The report had the following recommendations:

1. Relocate the expansion works if possible or relocation is not feasible proceed with the following recommendations.
2. Avoidance of impacts to Aboriginal cultural heritage through redesign. A buffer of a minimum of 20 m for artefacts and 50 m for art and rock shelters should be used.
3. Further assessment required if impacts cannot be avoided. If redesign to avoid impacts is not feasible, further assessment and an Aboriginal Heritage Impact Permit (AHIP) to destroy issued by Heritage NSW, Department of Planning and Environment (Heritage NSW) would be required for the works in their current design.
4. Register WQ1, WQ2 and WQ3 on AHIMS.
5. Reduce risks of impacts to Aboriginal cultural heritage.
6. Unanticipated aboriginal objects protocol be developed.
7. Unanticipated historical relics protocol be developed.
8. Discovery of human remains protocol be developed.
9. Continued consultation with RAPs.

It is noted that a rock shelter is located within the development area and another two are within the 50 m buffer. We understand Council has confirmed the current footprint will be progressed, noting the rock shelters and there will be a need to seek an AHIP.

4.7 Future land use

GHD understands that the development has no future land use nominated at present. It is understood that Council has no desire to landfill the void that will be created as part of these works into the future. For the purposes of the preliminary design, it is assumed that the future land use will be restricted particularly due to the falling from heights risk. GHD request an action for Council to provide confirmation of future land use, and that the above statement is correct or advise of alternate intentions.

5. Proposed development of the Eastern Platform

5.1 Objectives

The main objective of the Eastern Platform project is to support ongoing operations of the WMF by providing:

- A stockpile and storage platform area for excavated natural materials (ENM) and recyclable materials/miscellaneous items for either future use on-site or transport off-site.
- A source of cover material for existing and future landfill operations.

5.2 Key features

Key features of the Eastern Platform proposal include:

- Site establishment and vegetation clearance.
- Development of ancillary infrastructure including access and surface water management infrastructure.
- Earthworks and excavations.
- Use as a stockpile and storage area to support ongoing WMF operations.

The proposal is at concept design stage and SEARs have been requested to address planning matters. The storage platform size will be confirmed through design development and documented in the DA but is expected to have an overall footprint of approximately 4.1 hectares (ha).

The Eastern Platform site can be considered as two main areas, as shown in Figure 5.1:

- Eastern Area
- Northern Area

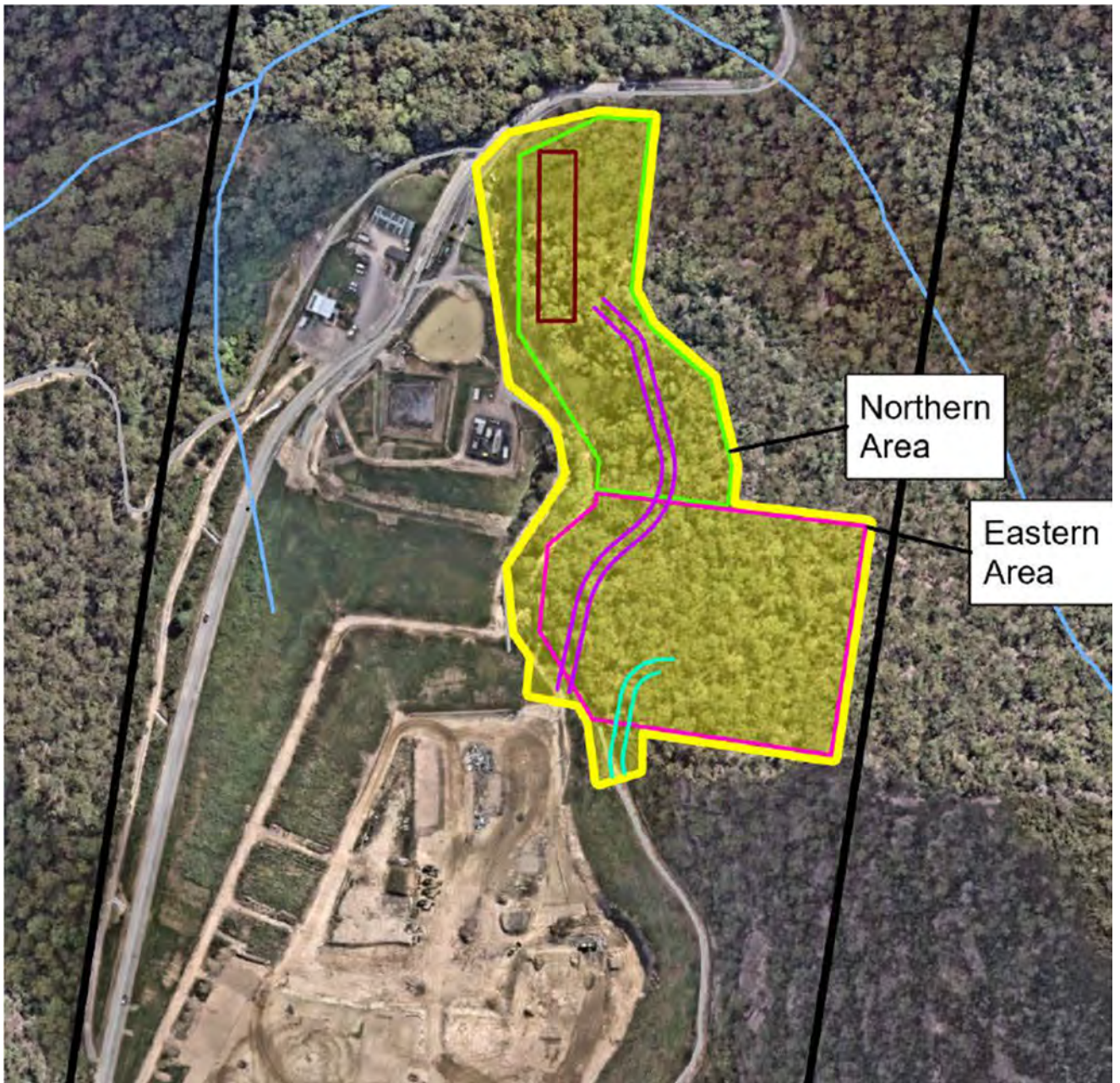


Figure 5.1 Site location within Woy Woy Waste Management Facility

Both areas will be used to generate cover material for landfilling operations. Preliminary indications are that approximately 80 percent of the required cover material will be generated from the Eastern Area, with the remaining 20 percent to be generated from the Northern Area.

The Eastern Area is proposed for:

- Stockpiling of ENM.
- Stockpiling of recyclable materials/miscellaneous items for either future use on-site or transport off-site.

The Northern Area is proposed for:

- Establishing a sediment basin.
- Possible future use as a transfer station – proposed to be located at the front of the WMF near the existing gatehouse/site office.

Drainage paths will be incorporated into the design to maintain the separation of surface flow over disturbed ground from the flow of surface water over undisturbed ground. Water travelling across disturbed ground will be directed to the sediment basin.

5.3 Staging

Approximately 650,000 m³ of cover material is estimated to be required between commencement of landfilling operations at the proposed South Cell and the expected end of landfilling at the WMF. All this material is not needed at once however, and the design will need to balance staging of the works to achieve both adequate stockpile area, as well as generation of enough cover material for landfilling activities as needed.

Staging of the proposal will aim to progressively and continuously generate cover material to support landfilling operations as needed.

The design will nominate a series of stockpile pad “floor” levels with the pad to be progressively excavated to deeper levels over time. It is estimated that approximately 30,000 m³ of material will be generated per annum, which will occur over a period of approximately 22 years.

5.3.1 Proposed staging detail

Stage 1

- Clearing of vegetation for sediment basin and access track to the basin site.
- Construction of access track and sediment basin in the Northern Area of the proposal footprint.
- Construction of drainage paths.
- Clearing of vegetation for access track and stockpile pad at the southern end of the Eastern Area.
- Excavation of material to form the initial pad area.

Stage 2 +

- The pad floor is lowered as additional material is required. The pad floor is arranged in such a way that an adequately sized stockpile area is available and an “active” pad floor may be under excavation at any given time to provide a constant source of cover material. As time goes by, the active floor area is rotated such that the overall pad level and pad lowering activity is relatively uniform.
- Excavation operations are likely to be such that a “campaign” is undertaken for a period where a large dozer rips and pushes up a large stockpile of material and further excavation is not needed for a period of months until the cover material stockpile is almost exhausted, and another campaign is undertaken.
- Natural surface levels in the Eastern Area are much higher than in the Northern Area. The bulk of material will be won in the Eastern Area, however when the pad levels approach the Northern Area levels, excavation of the Northern Area will commence. Both areas will continue to be excavated as required to achieve the balance of ultimate cover material needed.

The proposed overall excavation will extend from a reduced level of 159 m AHD to 74 m AHD, with the final platform comprised of two sections, notionally divided between the areas designated as Eastern Area and Northern Area. The initial focus on excavation will be in the Eastern Area (refer Figure 5.1) and is planned to be excavated to approximately 85 m AHD. As excavation gets progressively lower over time, excavation will begin to include the Northern Area, and will achieve the lowest levels of the site at 74 m AHD. Note that the levels are indicative for discussion purposes as the floor of the excavation will have a grade to shed water and for drainage.

A preliminary model of the proposed excavation (including sediment basin) is shown in Figure 5.2.

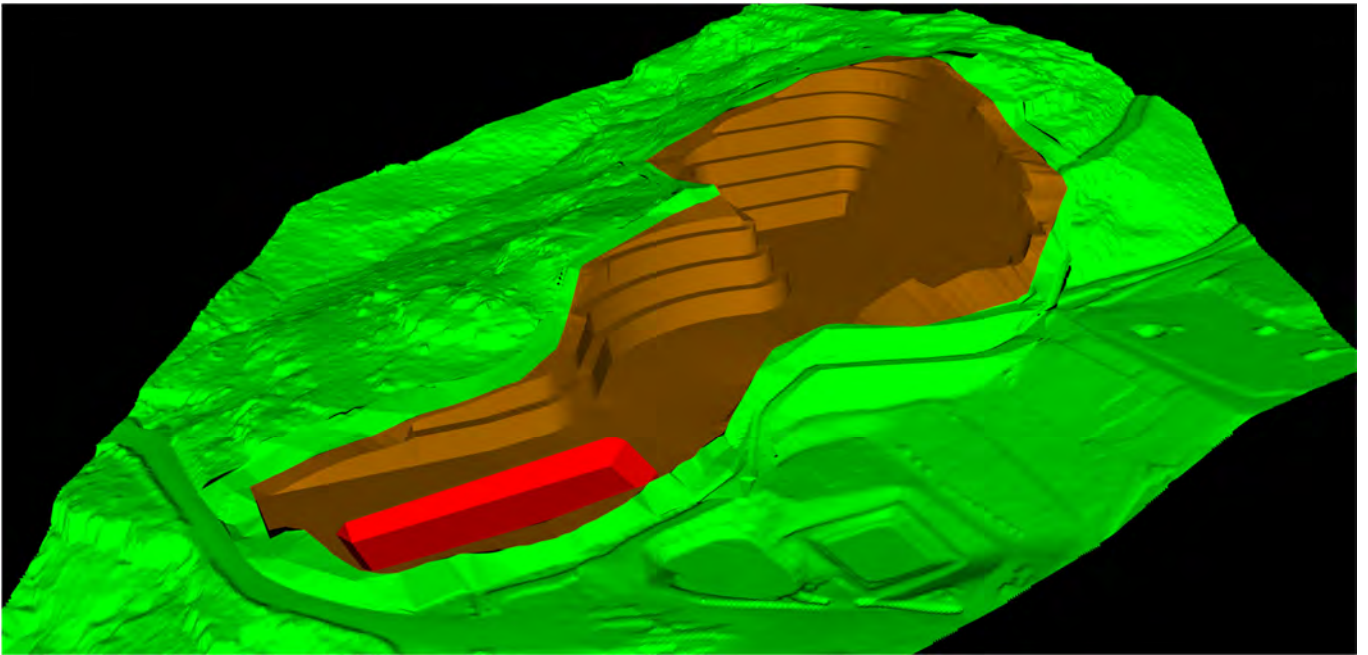


Figure 5.2 View of the preliminary 3D model showing the final excavation of the Eastern Platform

6. Civil design

The civil design will consist of:

- Earthworks associated with the design of the platform in the Eastern Area
- Sediment Basin in the Northern Area and associated earthworks
- Northern Area platform earthworks
- Access roads to work areas
- Access ramps to platform floor at any given time of the operations
- Staging throughout the operation of the area

6.1 Sediment basin

Within the development area, the clearing/grubbing and disturbing of in-situ soils has the potential to result in impacts to receiving waterways associated with suspended sediments/turbidity. Type D/F sedimentation ponds are proposed to be integrated into the works surface and would be constructed and expanded during development of the earthworks pad based upon the upstream catchment that it services. As increased area is available for construction of the basin, it is understood that a portion of the existing landfill catchment would be re-directed to this newly constructed pond to minimise requirements of existing sedimentation basins at the site which are understood to be generally undersized.

Type D/F Sedimentation Ponds rely on airspace being available to capture sediment laden runoff up to a design rainfall event for subsequent settling, and this zone is referred to as the “settling zone”. Sediment which settles within the pond is then stored in a lower zone referred to as the “sediment storage zone”. Following settling, the now managed water can then be reused, further treated (if required), and then discharged offsite.

6.1.1 Sedimentation basin sizing inputs and approach

The nominated design event for the northern portion of the catchment is to manage the 90th percentile, 5-day total rainfall depth within the settling zone, with allowance for either 50% additional storage within the sediment storage zone, or storage for sediment stored over a minimum 2-month period. Given challenges with removing sediment from ponds, it was assumed that the sediment stored would reflect cleaning out quarterly. Calculation of the storage requirements for the 3-month period relies on rainfall, soil, vegetation cover, construction methods and topography.

Rainfall

Managing Urban Stormwater – Soils and Construction: Volume 1 (Landcom, 2004, informally known as and herein as ‘The Blue Book’) states the 90th percentile, 5-day rainfall for “Gosford - Narara” to be 66.2 mm. Since the existing Blue Book was published, point-interpolated data is now available and was extracted for the site (sourced from SILO Long Paddock from 01/01/1900 until 1/11/2024 for -33.50, 151.30) with calculations by GHD suggesting a lower value of 57.1 mm being the 90th percentile, 5-day total rainfall depth. Conservatively a value of 62.2 mm was adopted.

The rainfall erosivity at the site (“R-Factor”), published by the NSW Government (<https://www.environment.nsw.gov.au/eSpade2Webapp/> accessed 1/11/2024) ranges up to 3167 over the works area and was adopted.

Soil types

At the site, the soil landscape is Hawkesbury (he), which typically comprises of well graded sands and sandy clays. Given high local relief, the landscape has extreme erosion hazard as a result of the steep slopes. Severe sheet erosion can occur during storms and once ground cover is destroyed, which is evident through gully erosion occurring on unpaved tracks and fire-trails. Generally, erosion hazard for non-concentrated flows is very high, and topsoils are susceptible to concentrated flow erosion, particularly once organic matter is cleared.

Hydrologic soil groups are generally group C/D, with well graded sands having a moderate-high runoff potential. A Hydrologic soil group C was adopted given the presence of sandy soils at the site.

The soil erosion hazard value, "K-Factor", published by the NSW Government (<https://www.environment.nsw.gov.au/eSpade2Webapp/> accessed 28/05/2024) ranges up to 0.054 at the site, which is relatively high reflecting the heightened erosion risk discussed above.

Vegetation cover

For fully bare areas, the vegetated, cover "C-Factor" approaches 1. A value of 1.0 was adopted considering the clearing proposed at the site and the nature of waste management facilities.

Construction methods

For landfills, heavy plant often are required to track-walk up and down the slopes, which corresponds to a "P - Factor" of 1.2.

Topography

A review of the survey suggests slopes can exceed 25%. Selection of an appropriate slope-length factor was based upon feasible slope-lengths that could be implemented as mitigation measures during construction. An LS - Factor of 2.81 was adopted and the following slopes-lengths are specified to be maintained through engineered controls.

Table 6.1 Specified slope lengths based upon average gradients

Slope gradient (%)	Maximum slope length in soils (m)
≤10% (1V:10H)	80 m
12% (1V:8.3H)	50 m
14% (1V:7.1H)	40 m
16% (1V:6.3H)	30 m
≤20% (1V:5H)	20 m
≤30% (1V:3.3H)	10 m
≤50% (1V:2H)	5 m

Settling zone sizing

Settling zone requirements were calculated per hectare of catchment based upon Group C soils:

$$\text{Settling Zone} = 5\text{-day, } 90^{\text{th}} \text{ percentile rainfall} \times \text{Runoff Coefficient (Group C)}$$

$$\text{Settling Zone} = 62.2 \text{ mm} \times 0.70 = 435.4 \text{ m}^3 \text{ per hectare of catchment}$$

Sediment storage zone sizing

Sediment storage zone requirements were calculated per hectare of catchment using either 50% of the settling zone (Method A), or the six-month storage estimated using the RUSLE equation (Method B):

$$\text{Sediment storage zone (Method A)} = 50\% \times \text{Settling Zone}$$

$$\text{Sediment storage zone (Method A)} = 50\% \times 435.4 = 217.7 \text{ m}^3 \text{ per hectare of catchment}$$

Sediment storage zone (Method B):

Soil loss = $R \times K \times LS \times P \times C$ (tonnes per hectare per year)

Soil loss = $3167 \times 0.054 \times 2.81 \times 1.2 \times 1.0 = 576.7$ tonnes per hectare per year

This reflects a "high" erosion hazard as per Table 4.2 of the Blue Book

Soil loss = $576.7/1.3$ (typical density of sediment) = 443.6 m³ per hectare per year

Soil loss = 416.6×0.25 (conversion to 3-months) = 147.9 m³ per hectare per 6-months

Sediment Storage Zone (Method B) = 147.9 m³ per hectare of disturbed catchment.

It is recommended that the larger 217.7 m³ per hectare of disturbed catchment be adopted per Method A to size the sediment storage zone. It is estimated that the sediment storage zone would require clearing out in the order of two times per year.

6.1.2 Sedimentation basin catchments and nominated size

The sedimentation basin size required for this portion of the site was estimated to be approximately 650 m³/ha of catchment (from the sum of Settling zone storage (435.4 m³/ha) + Sediment zone storage (435.4 m³/ha) = 650 m³/ha).

The potential catchment areas to be serviced from this basin were determined based upon the earthworks pad, access roads and future site operation.

The footprint of the Eastern Platform area as a whole is 4.1 hectares, and the actual capacity required is 2.34 megalitres (ML) (650 m³/ha × 4.1 ha = 2,535 m³ or 2.67 ML).

However in acknowledgement of the WMF site in its entirety and understanding that overall site sediment basin volumes are understood to be under-capacity, Council has indicated that it is desirable to maximise the size of this new sediment basin, which will allow sediment laden water from elsewhere on site to utilise the new basin.

The preliminary dimensions and capacity of the sediment basin at concept design stage is 6.6 ML.

6.2 Earthworks pad

The development area will be used to generate cover material and be used as a stockpile area during staging where this area will be lowered in sections over time. It is estimated that approximately 650,000 m³ of material is ultimately required to be excavated from this area. Once the ultimate design level has been achieved, the site will continue to be used as storage/stockpile areas.

It is proposed that the earthworks pad will gradually be lowered over time to win more material. To achieve the desired material volume, the platform will ultimately be approximately 15,726 m² and feature a graded floor. The Eastern Area will generally slope from an RL of approx. 90 m to 86 m, while the Northern area will slope from an RL of approx. 86 m to 75 m. The overall disturbed footprint area is approximately 41,307 m².

As noted in Section 4.3.1, the following slope profile will be adopted for design:

- 10 m high batter face
- 5 m wide bench
- Batter slopes angles up to 70° (over all wall angle of approximately 55°)
- Any fill batter slopes should be laid back at 2H:1V

6.2.1 Ultimate completed design surface

In acknowledgement of the large volume of material required to be achieved over the life of the development area (650,000 m³), the following figures are presented as preliminary high-level indication of the ultimate shape of the development area after all excavation is completed.

The logic for firstly arriving at the ultimate completed surface is to have a design goal to aim towards. As the WMF will only utilise approximately 30,000 m³ of material per annum, it is a 20+ year exercise to achieve the final surface. The design needs to consider a number of stages over the 20 year life of the works and what the platforms and access road look like at any given point in time.

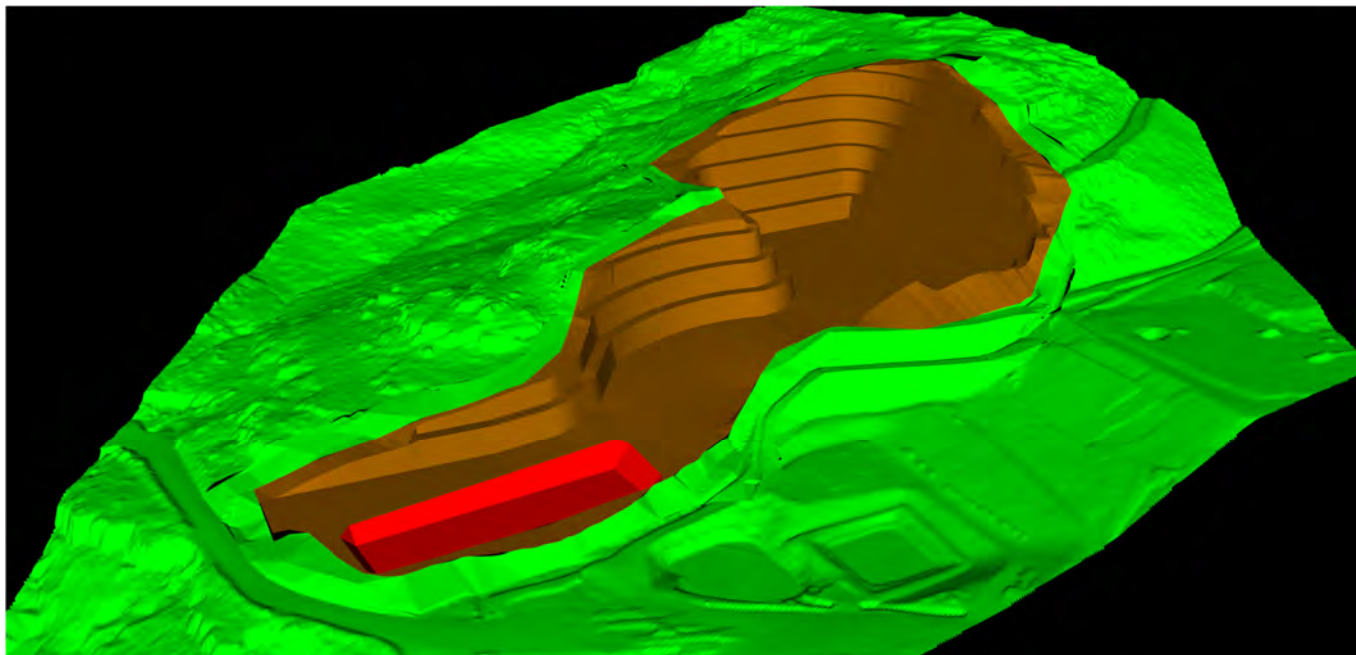


Figure 6.1 *Ultimate final surface*

6.3 Access roads

With reference to Figure 6.2 below, two access roads are proposed. The southern road connects to an existing track and is referred to as “Initial Access Road”, while the other road is referred to as “interim access road”.

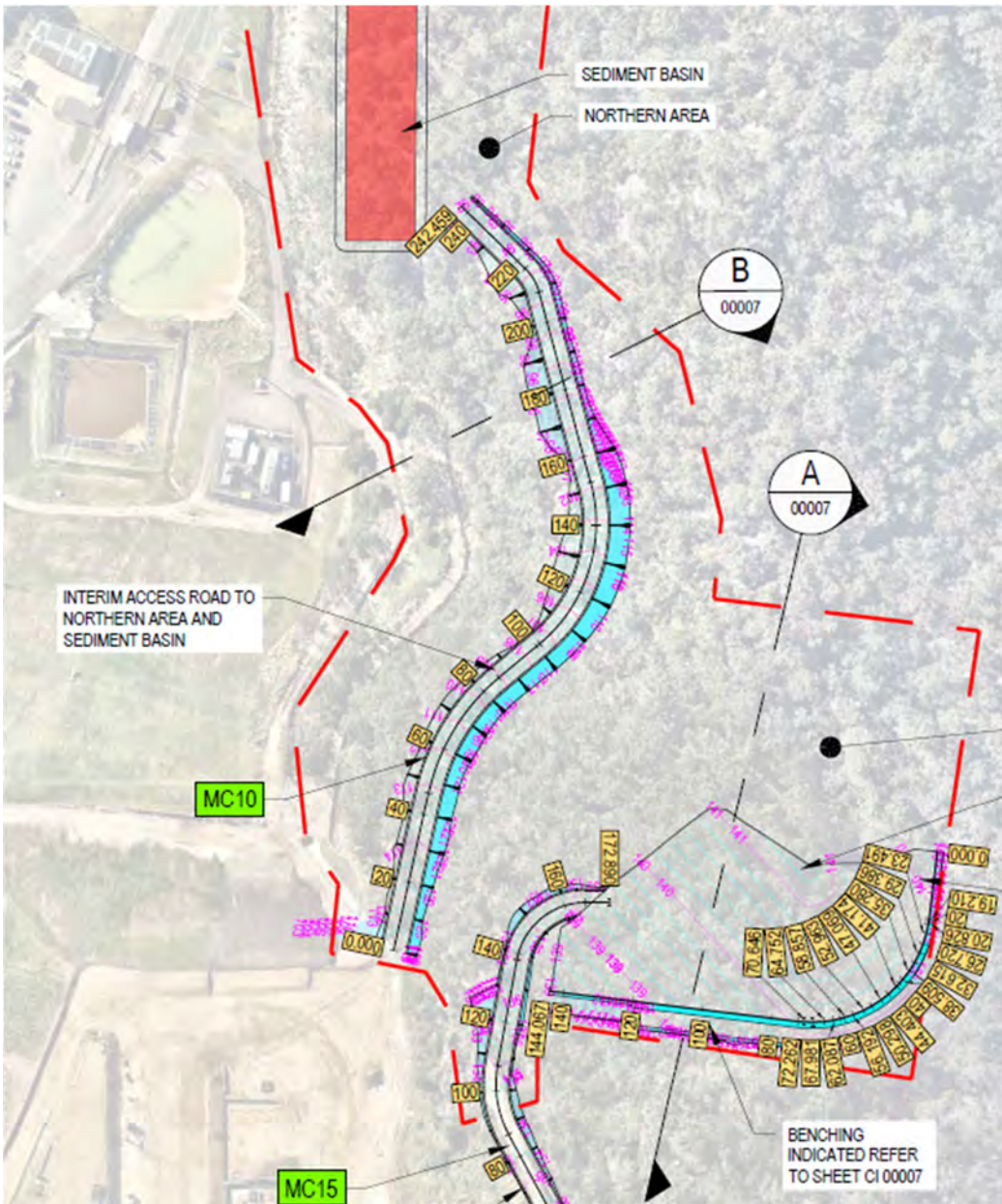


Figure 6.2 Access roads designations

6.3.1 Initial access road

Access to the Eastern Area is required from the existing internal road network and will be the initial part of the work performed and will produce the initial pad area. Through discussions with Council Operational staff, the entry point to the Eastern area is proposed to be from an existing track along the eastern extents of the current tipping area. This entry point is at an RL of approximately 134 m.

The access road will need to extend from the entry point to the eastern pad area, and will need to be altered over time as the pad platform lowers.

It is to be determined through further design stages whether a time will come when this access road is abandoned as the floor of the Eastern Area reaches a level where it is too low for this to be a viable entry point. Alternatively, switchback type ramps may be developed which allow continued use of this access track.

6.3.2 Interim access road

An access road will also need to be developed which opens up access to the Northern Area, including the sediment basin. This access road will allow vehicles to travel between the Northern Area and the current landfill area. Through discussions with Council Operational staff, the entry point to the Eastern area is proposed to be from the existing landfill area which will cap out at an RL of approximately 115 m. The location of the access at this point has allowed an access road from RL's between 115 m and 75 m to be achieved. This access road will also need to be altered over time as the pad platform lowers.

Material from the northern area (initially generated from sediment basin excavation) will be transported via the access road directly to where it is required or to the Eastern Area to be stockpiled.

6.3.3 Design Standards

The following design standards were adopted and are summarised below in Table 6.2:

- Austroads Guide to Road Design Part 3
- Austroads Guide to Road Design Part 5
- Unsealed Roads Manual ARRB Chapter 4

Table 6.2 *Adopted design parameters*

Item	Parameters	Comment
Design vehicle	19 m Semi Trailer	
Road width	4.0 m carriageway width – single lane	One lane proposed with layby to be provided every 50 m
Pavement	Unsealed	
Maximum vertical grade	Maximum vertical grade of 12% due to unsealed pavement	In compliance with the unsealed roads manual
Minimum horizontal curve	Radius of 12.5 m	
Edge bunds	Edge bunds (0.5 m high, 0.5 m crest width, 1:2 batters)	

GHD has undertaken an optioneering process to determine what the initial stages of construction of the eastern and northern platforms and the access roads will look like.

It has been particularly challenging to determine the most pragmatic approach to achieving an access road between the eastern and northern portions of the development area.

A number of high levels options for the access road which all aim to link the eastern platform in the south to the northern area platform and sediment pond were developed and are presented in Appendix B.

Note that the access road/s are also referred to as haul road/s in Appendix B.

6.3.4 Preferred access road option

Following a number of discussions with Council and presentation of different access road options at progress meetings, it was agreed that two access roads would be adopted as it was not possible to achieve a compliant single road design from the very top to the very bottom of the site, as described above.

6.4 Drainage routes

The site has existing clean water, and dirty water drains which will need to be re-aligned for the new development. The figure below shows the existing drainage network.

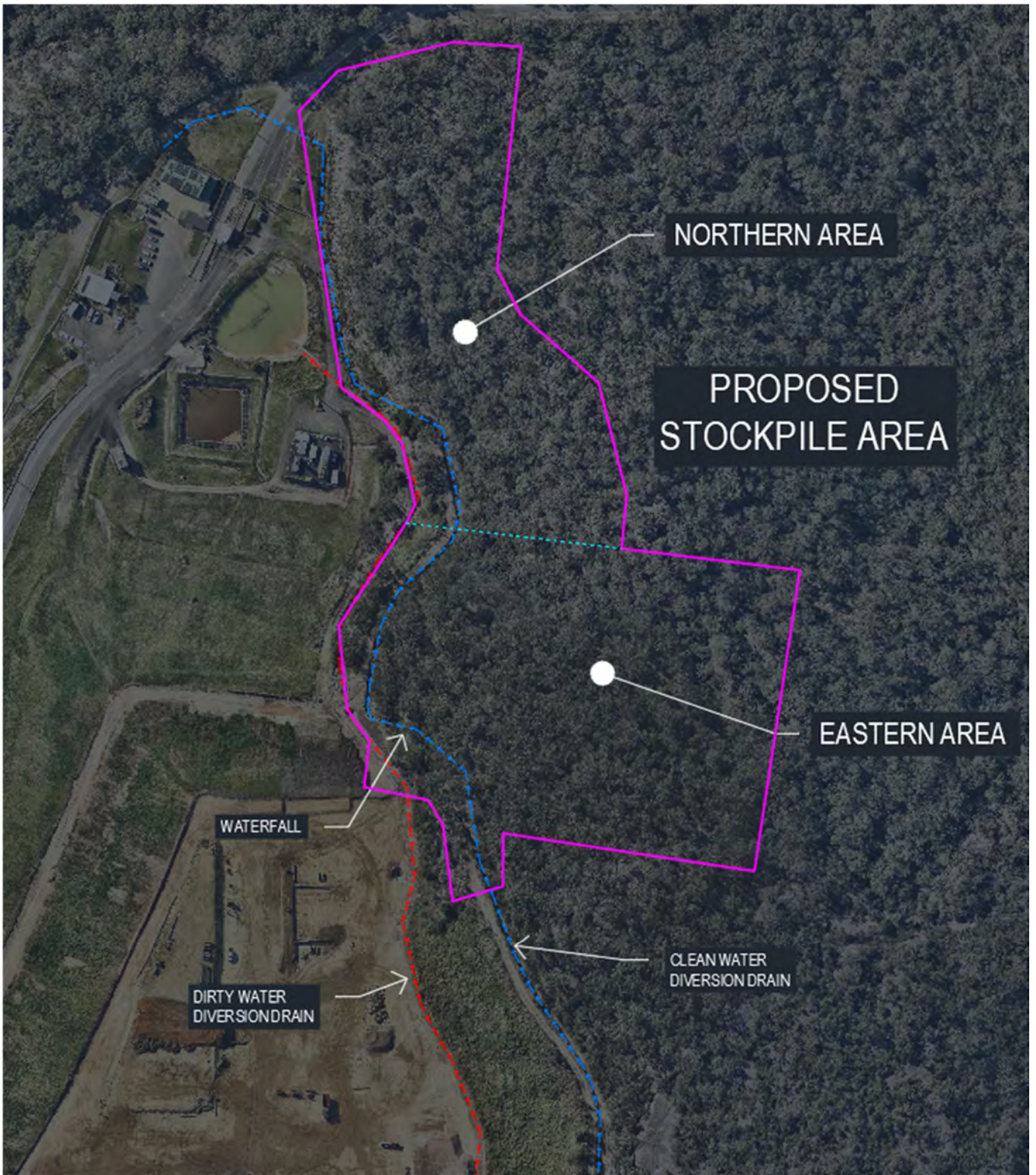


Figure 6.3 Existing drainage network

Initial drainage re-routing considered what areas of the development would produce dirty water and how this would be routed to the new sediment basin. The figures below show the proposed design for the new drainage routes.

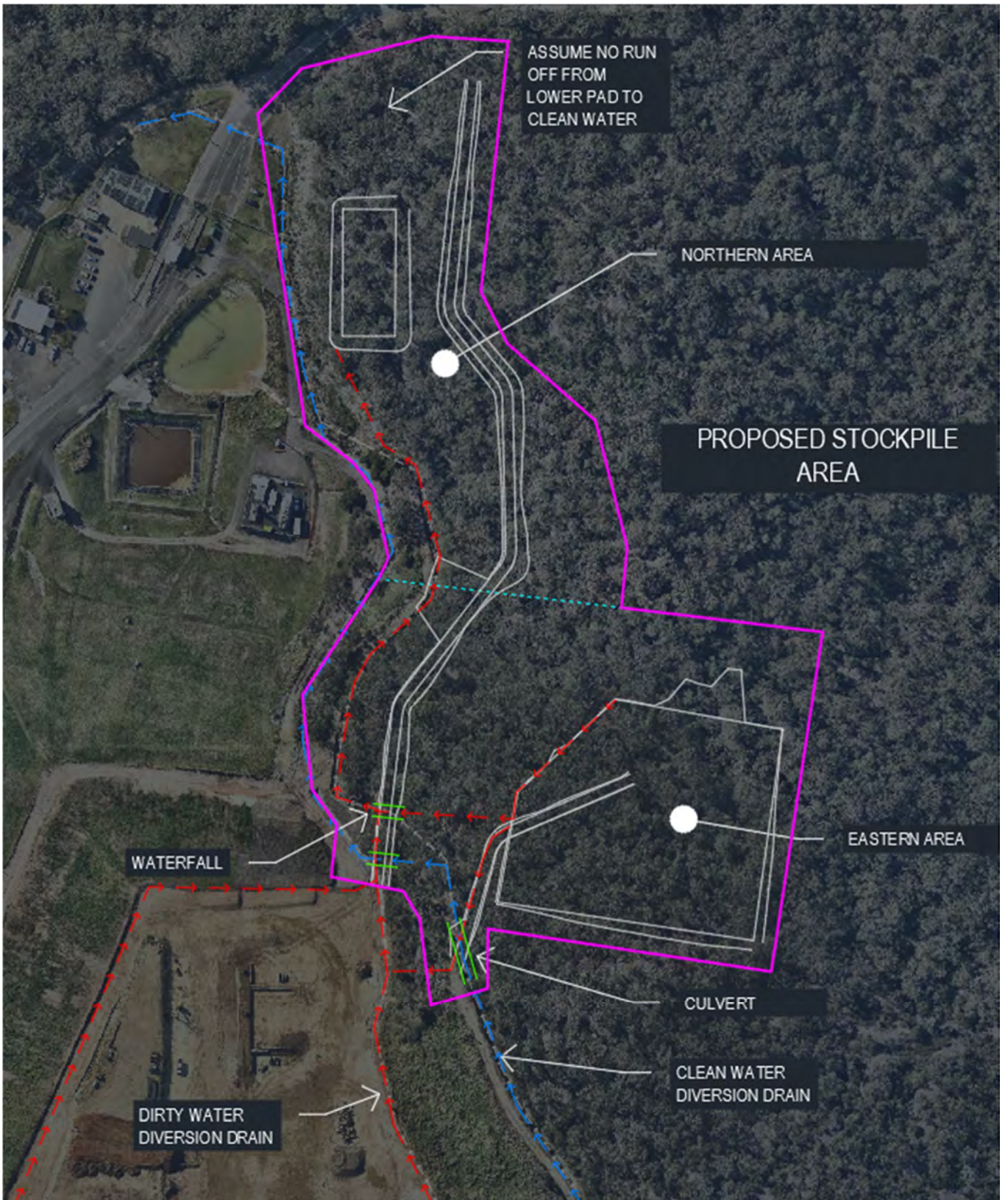


Figure 6.4 Design stormwater routes



Figure 6.5 Design stormwater routes magnified

The design features three culverts, two under the interim access road from the transfer station pad and one under the initial access road from the current access track at a point near the camera pole.

Referring to Figure 6.5 which is a magnified view, the clean and dirty water systems will cross over with the use of one of the culverts. The clean water drain will then utilise the existing dirty water drain until just before the existing sediment basin. The dirty water drain will then utilise the existing clean water drain, and catch any runoff from the development area, without contaminating the lower clean water drain. This will then be diverted to the new sediment basin, and the clean water drain will re-utilise the existing clean water drain to the north.

This proposed arrangement will be further developed during the next design stage.

7. Safety in Design

GHD will undertake a comprehensive safety in design assessment as part of the design works. A preliminary assessment that has identified risk and associated control measures is summarised in Table 7.1.

A Safety in Design workshop will be conducted with Council officers when design is at a more progressed stage.

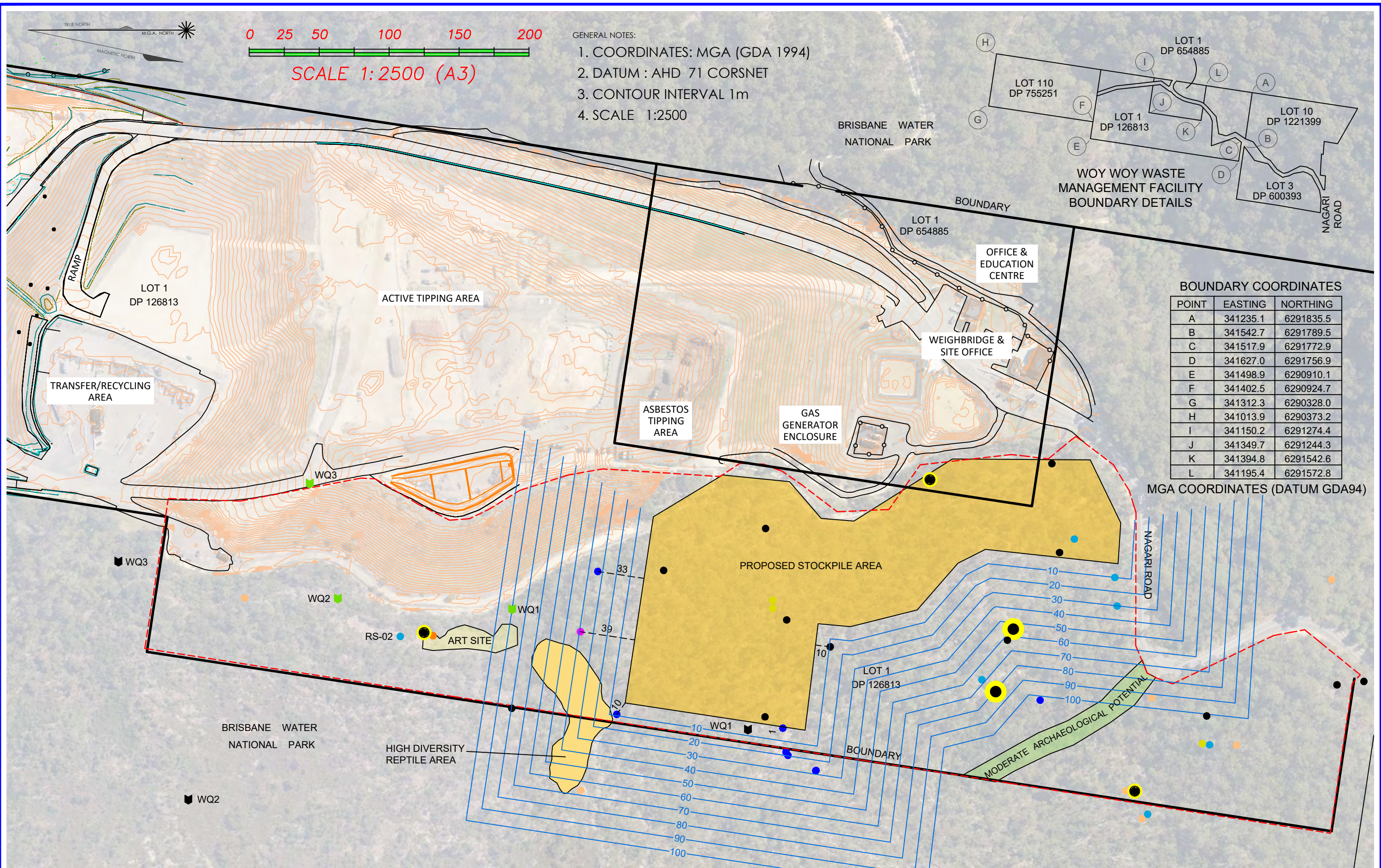
Table 7.1 Identified primary risk and recommended control measures

Identified primary risk	Recommended control measure
Movement of construction machinery.	Develop safe work method statement for working around machinery.
Construction on steep slopes and ongoing stability.	Develop safe-work method statement for construction and operation of the project.
Objects falling from heights.	Develop exclusion zones and safe-work method statement for construction and operation of the project.
Dust, noise, and odour generation.	Develop safe-work method for limiting dust, noise, and odour generation during the construction of the project.

Appendices

Appendix A

**Preliminary constraints analysis overlay
of significant Aboriginal sites and
biodiverse sensitive areas**



LEGEND

STUDY AREA	ROCK SHELTER	ROCK OVERHANG (BAT ROOST)
WQ SITE (AMG)	WQ SITES	ROCK OVERHANG (SMALL GUANO)
WQ SITE (REPORT)	SURFACE ARTIFACT	ROCK OVERHANG
	CALLISTEMON LINEARIFOLIUS	YELLOW TAILED BLACK-COCKATOO
	BROWN GOSHAWK	
	BURROW	

Barry Hunt Associates

REGISTERED SURVEYORS AND LAND DEVELOPMENT CONSULTANTS
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 Email ~admin@surveyors.com.au

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 L.G.A. CENTRAL COAST

CLIENT: CENTRAL COAST COUNCIL

PLAN: PRELIMINARY CONSTRAINTS ANALYSIS
 OVERLAY OF SIGNIFICANT ABORIGINAL SITES AND BIODIVERSE SENSITIVE AREAS

CAD REF: 56510 PCA

SHEET 1 OF 1

Appendix B

Haul road/access road concept options

Option 1 – Preliminary pass

For the preliminary pass, the sediment basin was located as per the ultimate design. The haul road started at this ultimate design surface near the sediment basin and continues up the hill at a grade of 12% making approximately 7 turns until it ends at the southern access point. Road length is 481 m and is 4 m wide. The cut batter used for this initial pass was 1V to 1H for cut and fill and would likely change. The cut fill balance for this option is presented below in Table B.1.

Table B.1 Option 1 haul road cut/fill

Cut (m ³)	Fill (m ³)	Difference +/- (m ³)
33,437	513	-32,923

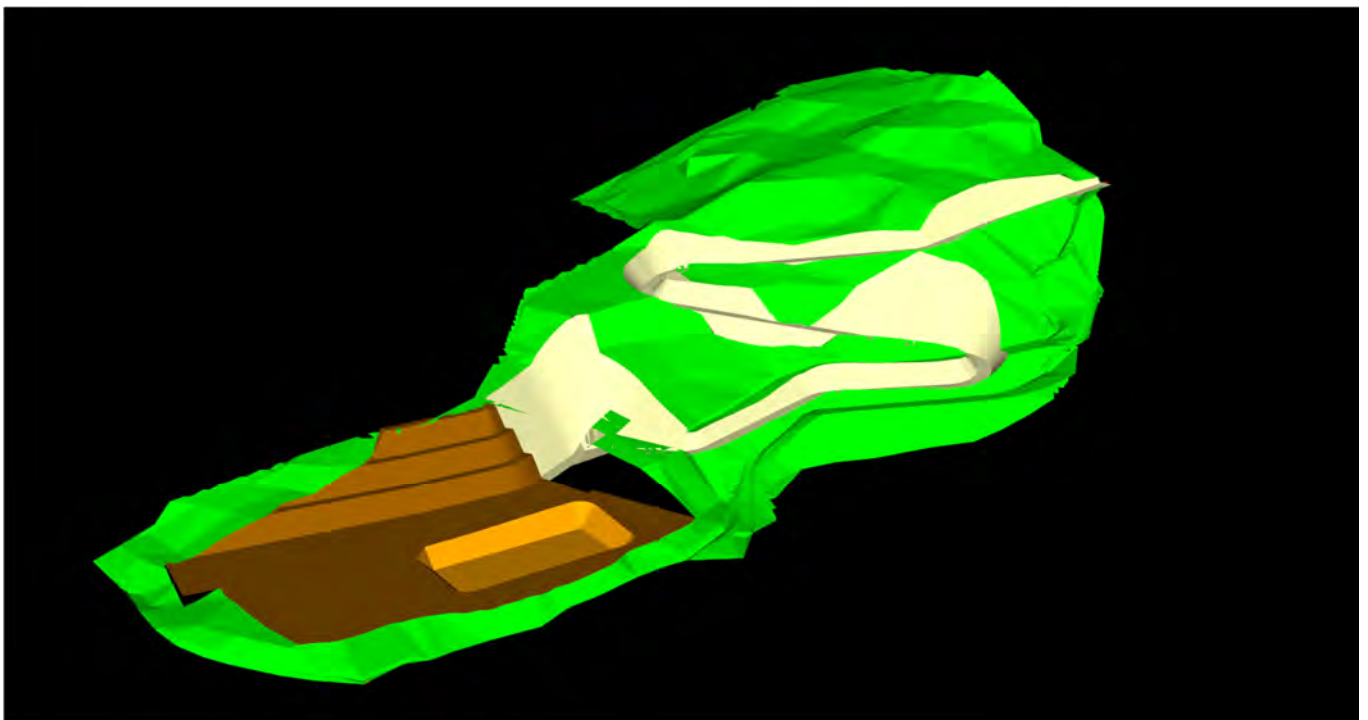


Figure B.1 Option 1 – Ortho view

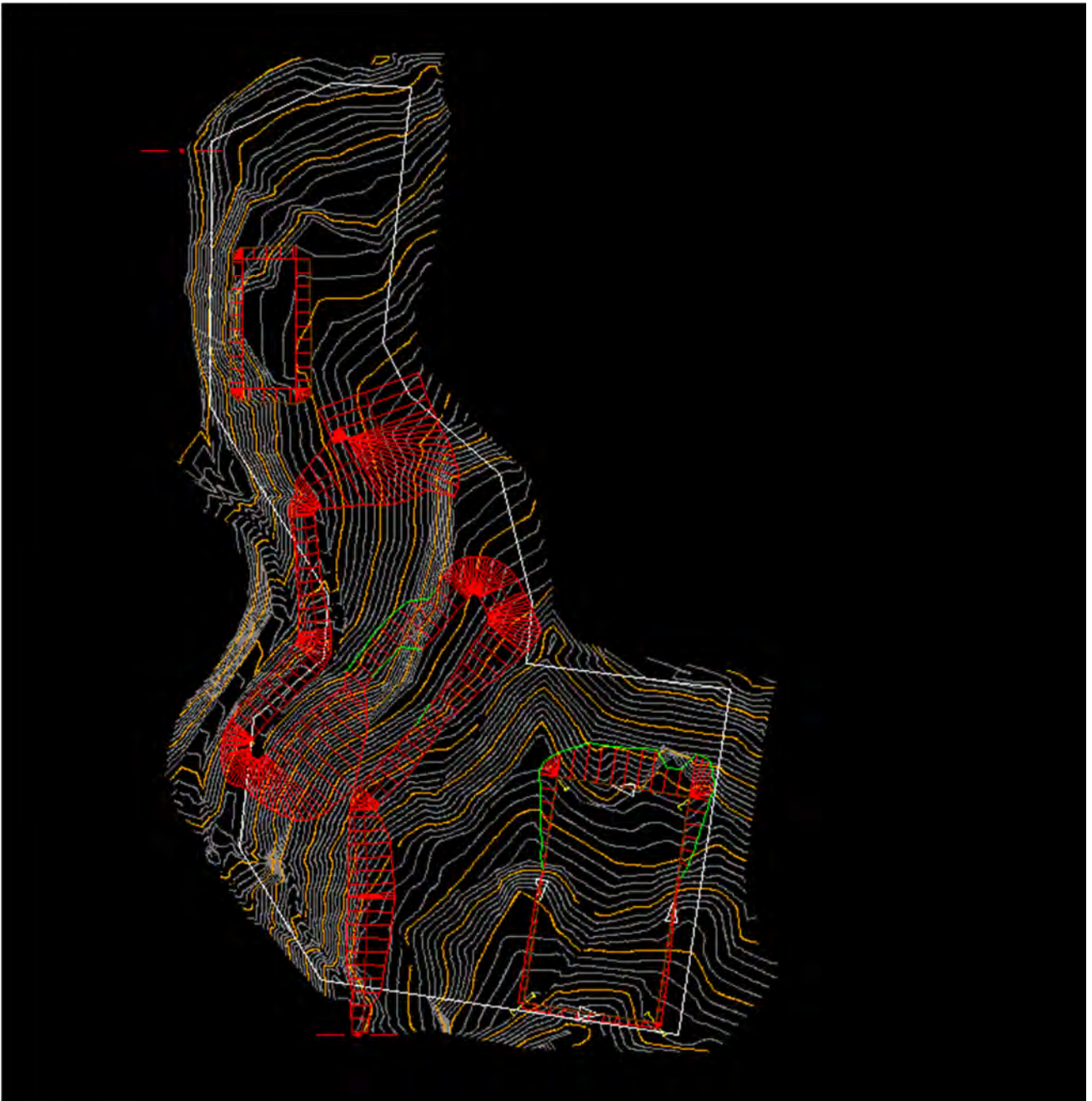


Figure B.2 Option 1 – Plan view

Option 2 – North area to south area with additional access point

The sediment basin was moved approximately 45 m to the north. This allowed for better grades up the hill whilst also allowing truck turning at the very north side of the northern area. A rectangular platform (50 m x 85 m) was used to represent stage 1 of the project and was levelled at RL144 m.

The 4 m wide haul road extends back from the northern area, at a grade of 12% and makes approximately seven turns as it winds up the hill. A minimum horizontal curve of 12.5 m was used for the road. The haul road finishes at the southern stockpile area after 573 m. There is an offshoot to the Southern access point, located at chainage 515 m. The addition of kerb returns on this access point intersection will allow trucks to travel in all directions when navigating the haul road.

Table B.2 Option 2 haul road cut/fill

Cut (m ³)	Fill (m ³)	Difference +/- (m ³)
27,452	3,246	-24,206



Figure B.3 Option 2 – Ortho View 1

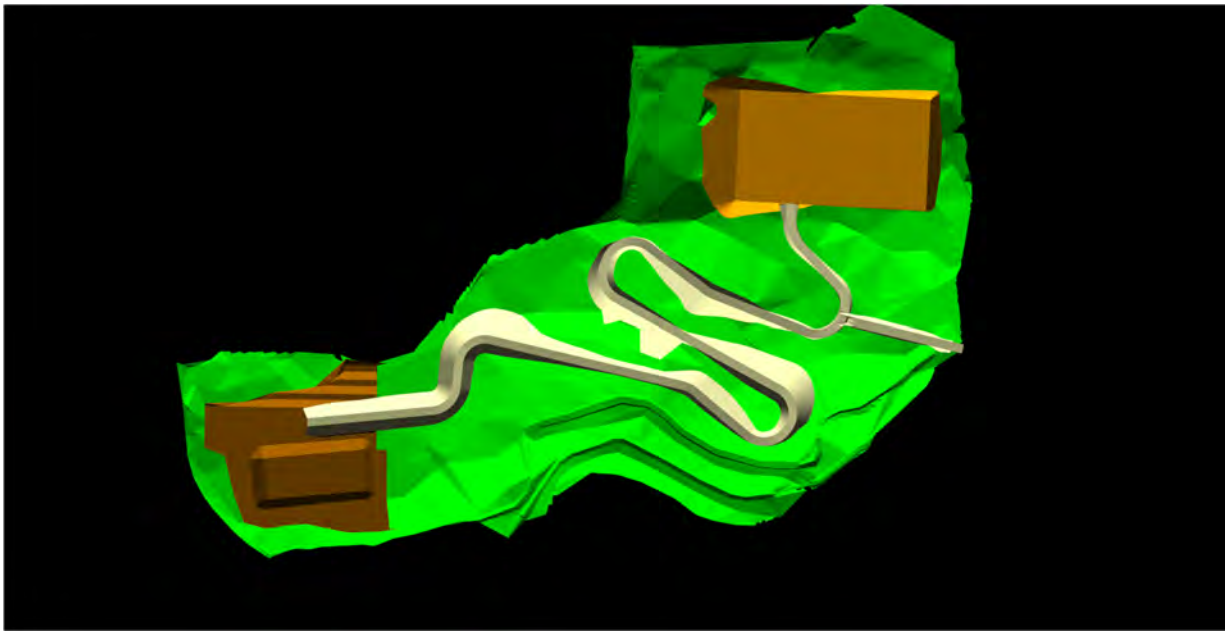


Figure B.4 Option 2 – Plan View 1

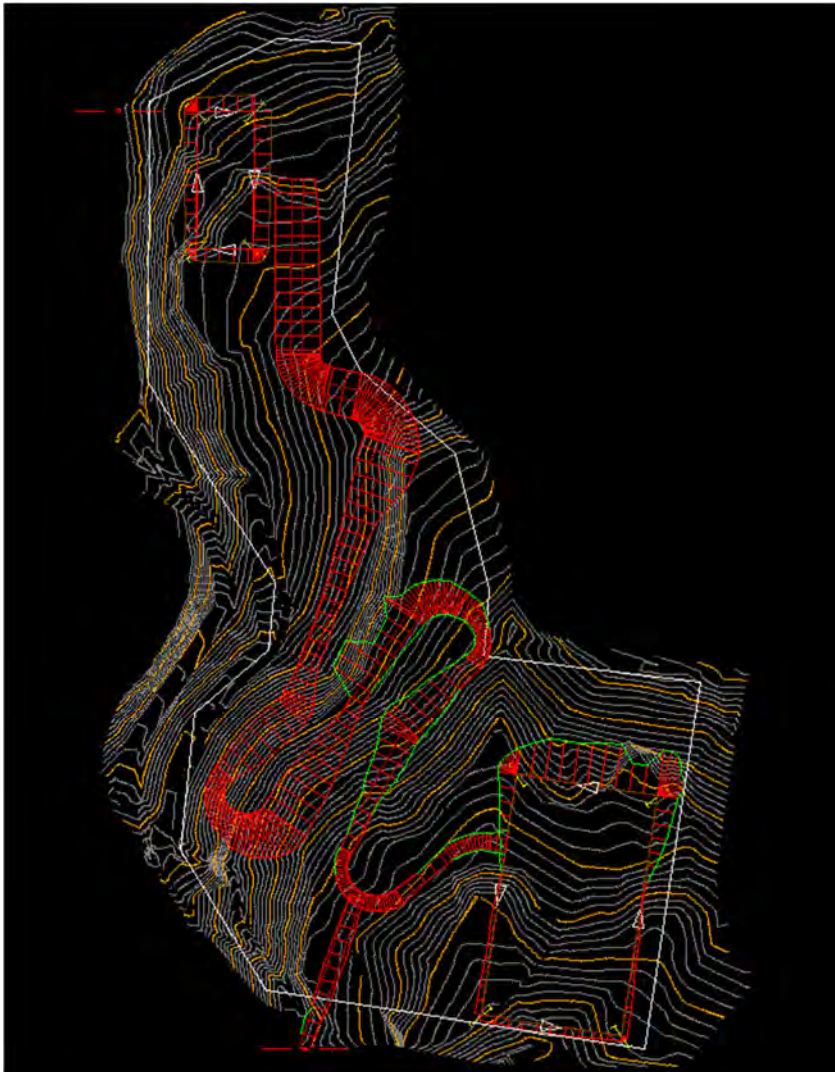


Figure B.5 Option 2 – Plan View 2

Option 3 – North area to access point with additional access to south area

Option 3 featured a route that was ran from the northern area to the southern access point rather than the southern stockpile area. Instead, a junction was located adjacent to the stockpile area for trucks to be able to turn into the southern area. The road is approximately 640 m long x 4 m wide and the intersection is located at chainage 555 m. The road grades are up to 12% until the intersection, then grades downwards towards the southern access point at 9.5%. The cut/fill balance for this option are shown below in Table B.3.

Table B.3 Option 3 haul road cut/fill

Cut (m ³)	Fill (m ³)	Difference +/- (m ³)
12,326	13,563	1,210

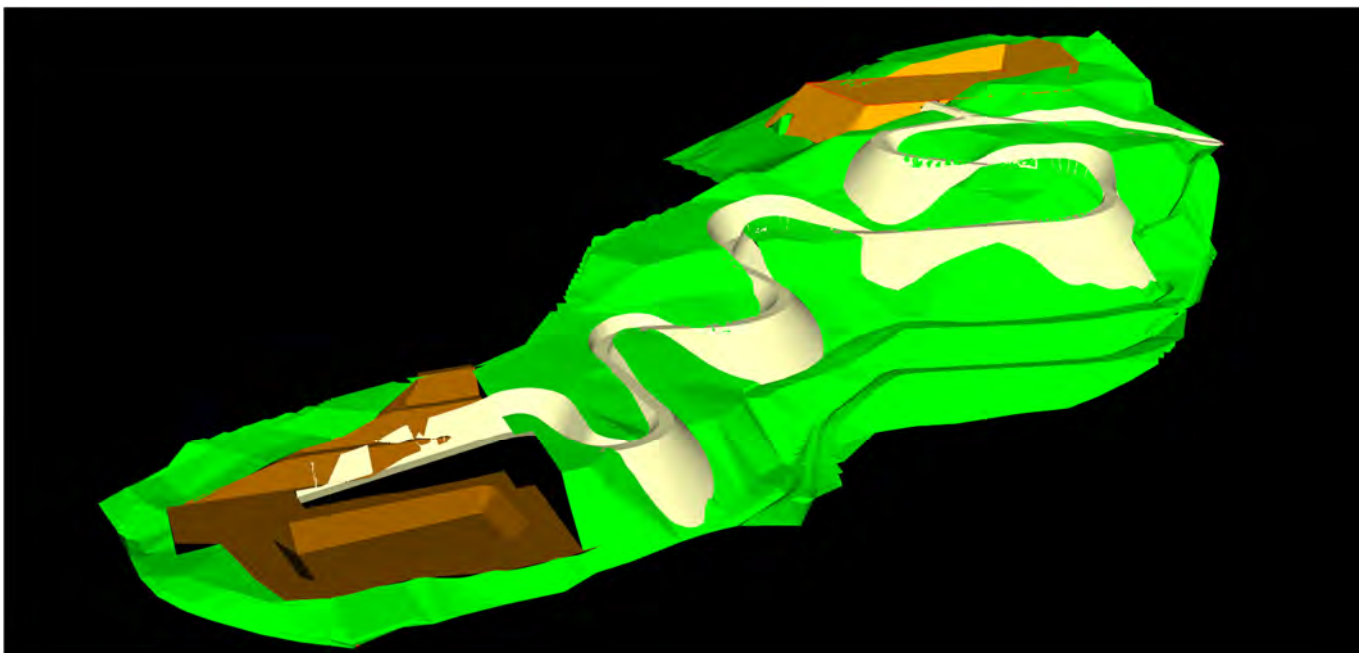


Figure B.6 Option 3 – Ortho View

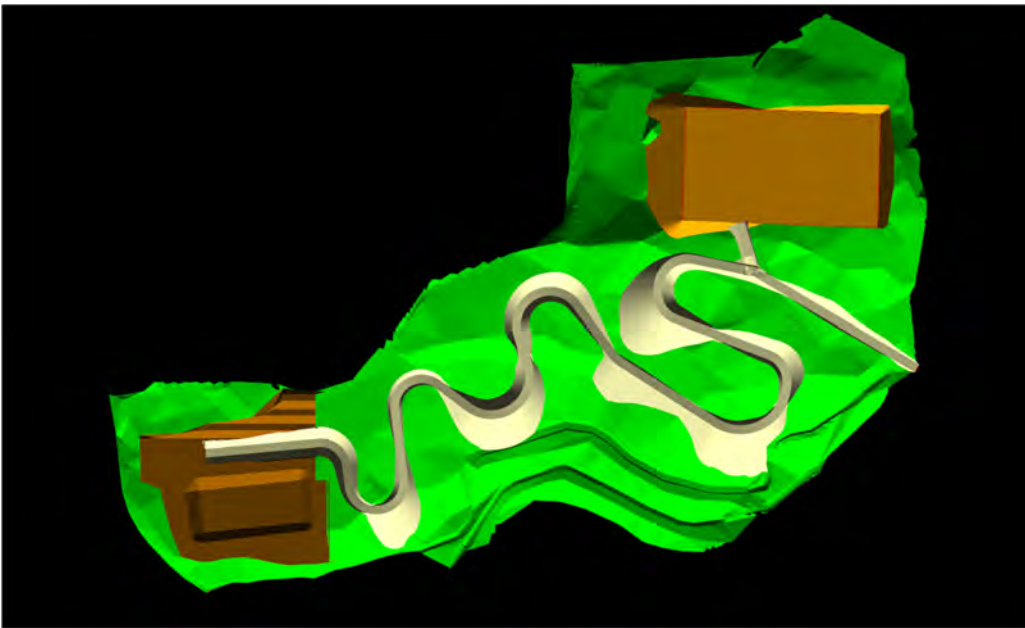


Figure B.7 Option 3 – Plan View 1

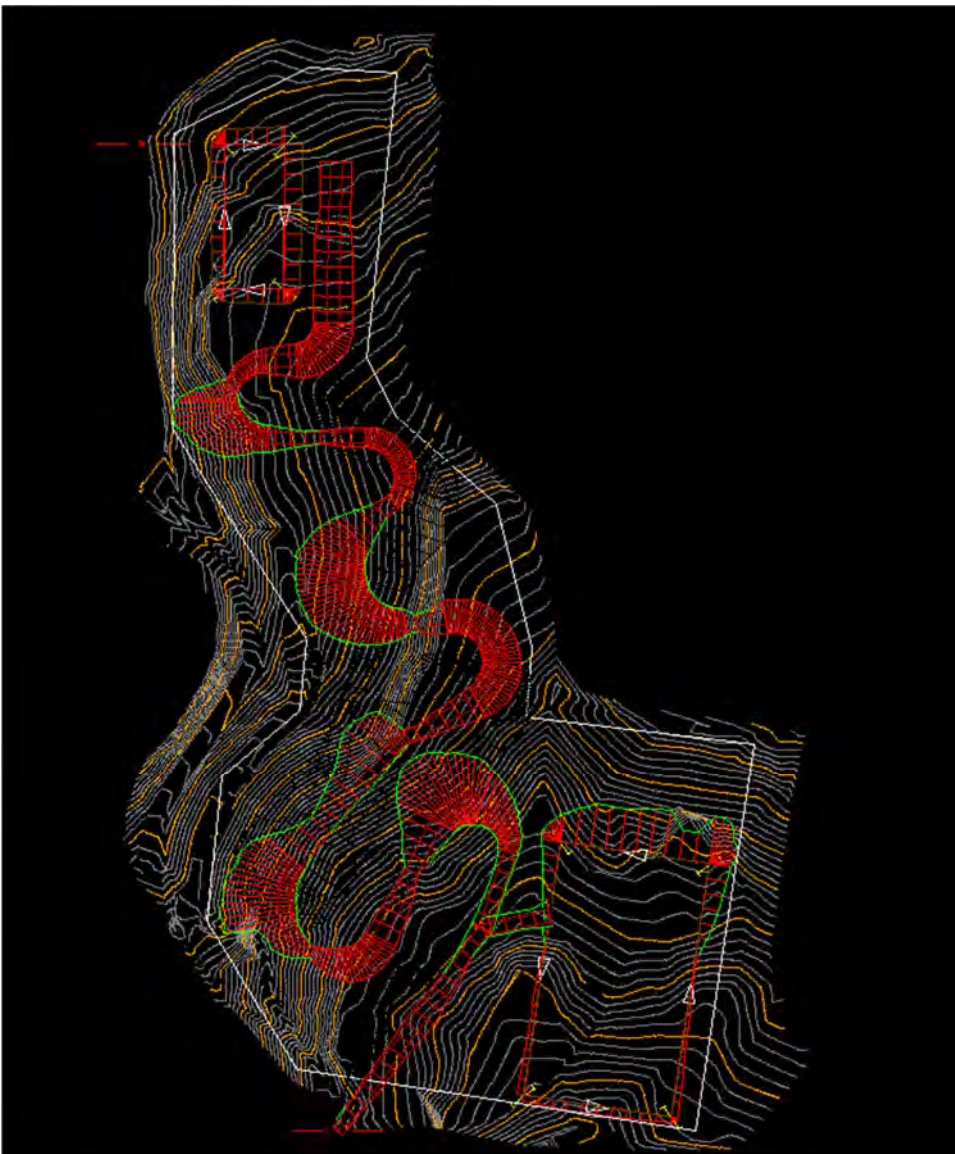


Figure B.8 Option 3 – Plan View 2

Option 4 – Split haul roads

Option 4 features a split haul road design between the northern sediment basin area and the southern stockpile area. The haul road begins next to the sediment basin, like options 2 and 3, and travels up towards an access point of the western side of the site, without the need for switchbacks or ‘snaking’ in the road. The haul road grades up at 12% until it reaches the existing surface level of the access track and follows the track to the extents of the survey at an 8% grade.

The higher section of track enters the site from the southern access point at the camera pole and makes its way to the upper stockpile area at a grade of approximately 7.3%. Due to the nature of splitting the haul road into two parts to avoid the steepest middle section of the site, the distance that trucks will be required to travel between the upper and lower areas will triple. The total length of option 2 is ~570 m and the total length of option 4, including an approximate distance through the facility, is 1,700 m. This distance is broken down in Table B.4 below.

Table B.4 Option 4 haul road distances

Haul road section	Distance (m)
Lower Section	243
Facility Section	1,350
Upper Section	113
TOTAL	1,706

Due to the removal of the switchbacks in the middle of the site, this haul road design will allow for a temporary sediment basin to be constructed to the north-west of the upper stockpile area during the early phases of the project. Without many tight turns, it will also allow the haul road to be wider, potentially allowing 2-way truck travel and increase horizontal sight distances. This option may also be better for future use as a lower entry point on the western side of the site will be beneficial for ease of access as construction progresses and the pad comes down.

The pad was also extended to the west near the haul road to obtain extra surface area for stockpiling. By doing this, the pad is no longer approximately equal in cut and fill volumes and contains a lot more cut volume. The volumes for the pad and haul road are shown in Table B.5 below:

Table B.5 Option 4 Cut/Fill

Section	Cut (m ³)	Fill (m ³)	Difference +/- (m ³)
Redesigned pad	31,250	8,252	-22,998
Lower haul road	13,435	13	-13,322
Upper haul road	183	103	-80
Total	44,868	8,368	-36,400

It was advised that the lower haul road was not able to be utilised due to external site restrictions on the bench road, which results in the lack of ability of it to support the required trucks. This means that this option has become unfeasible.

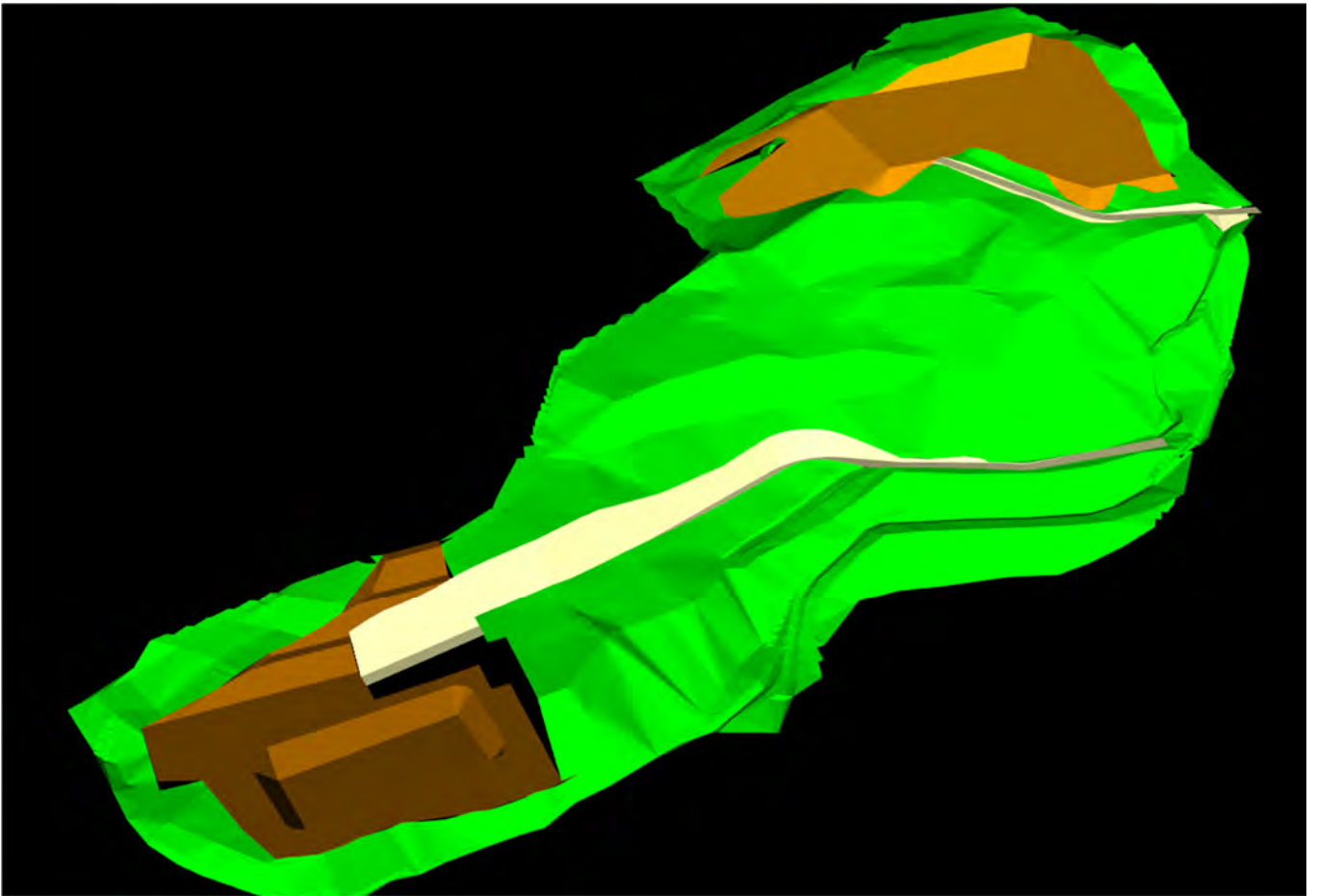


Figure B.9 Option 4 – Ortho View

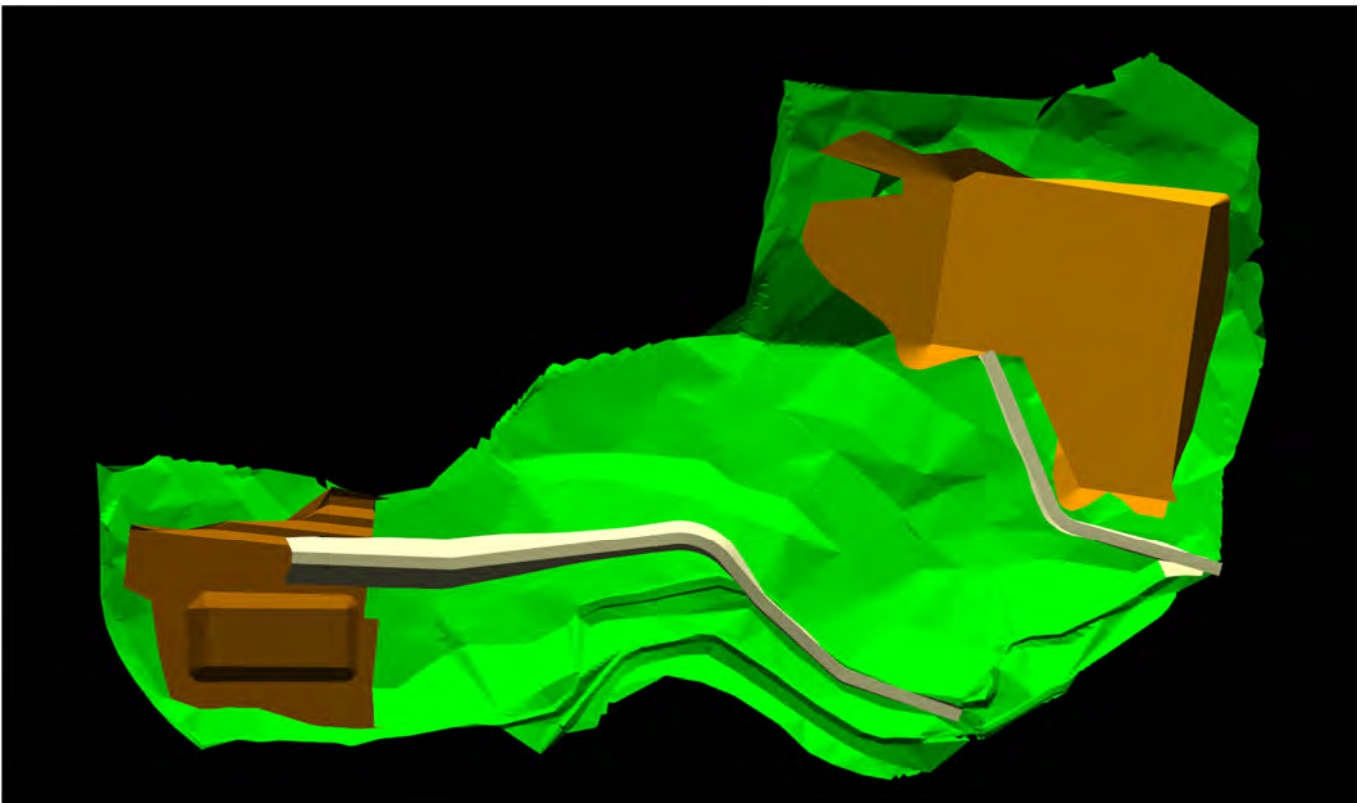


Figure B.10 Option 4 – Plan View 1

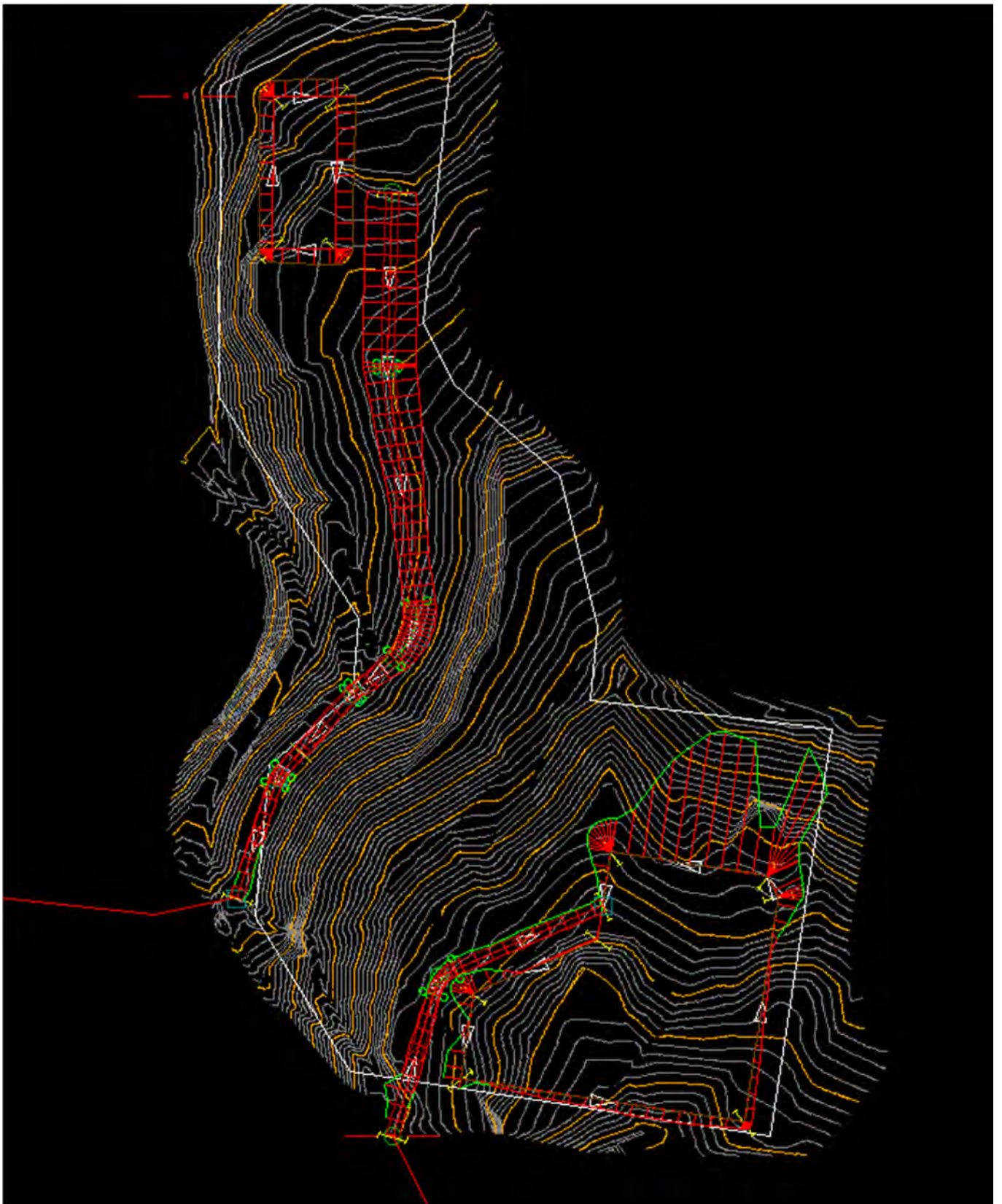


Figure B.11 Option 4 – Plan View 2

Option 5 – haul road outside of project boundary

This haul road option starts at the upper entry point of site and works its way down to the proposed sediment basin lower platform at a grade of -12%, which is the same gradient used for the other haul road options.

This haul road option exits the project boundary shown by Appendix A and runs off to the east of the site for approximately 40 m before making a U-turn and coming back within the boundary. The option works to reduce the number of switch backs that are used within the constraints area with the likes of option 3 and works to reduce batter slope lengths. The haul road is modelled to keep as much of the road as possible inside of the constraints area. To reduce the potential impacts for any environmental concerns.

The two closest constraints to the haul road are two rock overhangs which contain bat roosts. The biodiversity report says that the microbat roosts must have a 50 m buffer zone around them. The haul road currently does not adhere to this buffer zone and has a distance of approximately 30 m to the bat roosts.

The haul road is entirely within cut, with no fill expected. Cut batter has been modelled to 5V:1H. The largest batter slope that this design currently produces is 11.5 m high batter. Cut and fill is shown in Table B.6.

Table B.6 Option 5 Cut/Fill

CUT	FILL	BALANCE
-22050	4.287	-22046

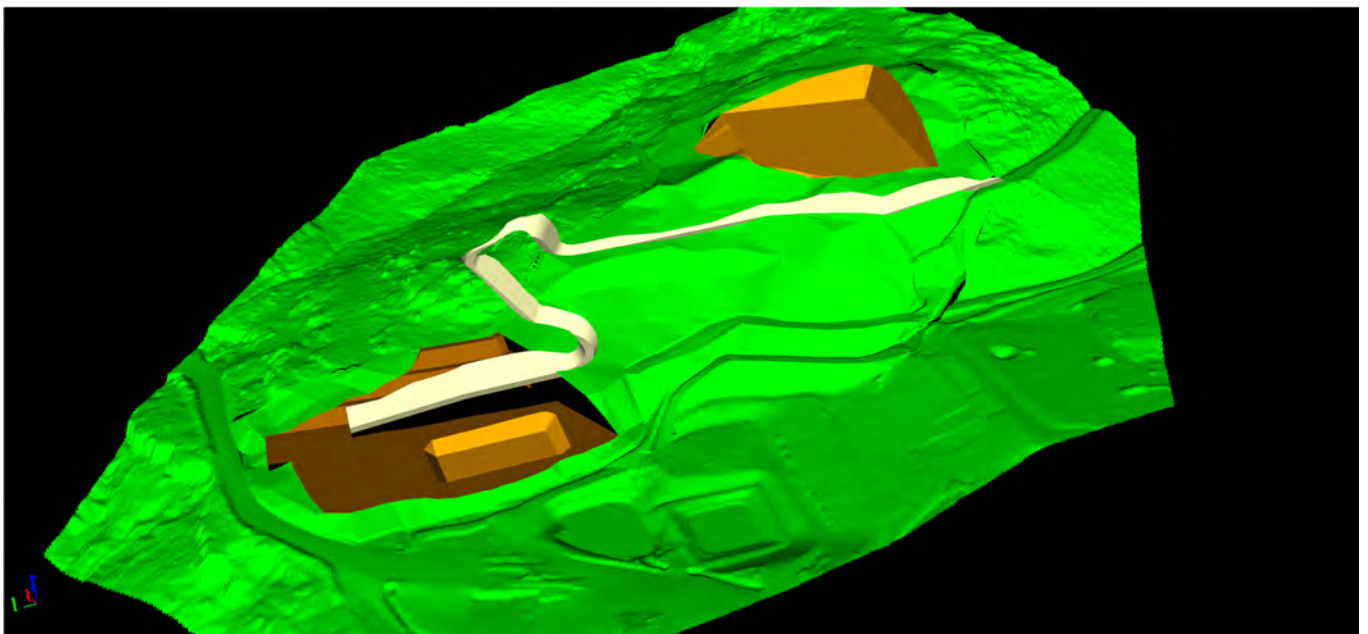


Figure B.12 Option 5 – Ortho View

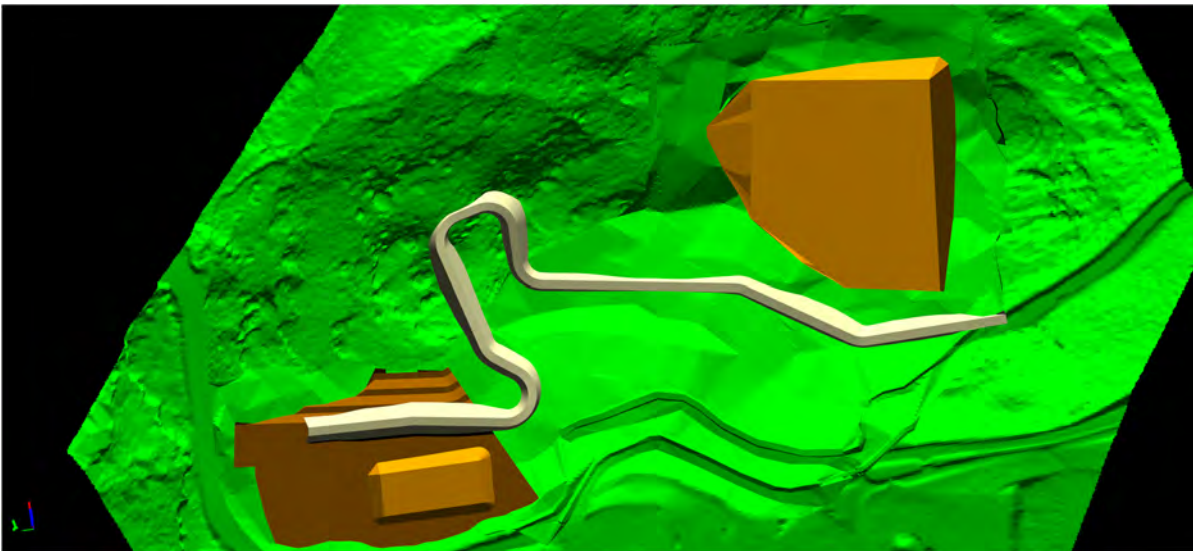


Figure B.13 Option 5 – Plan View 1

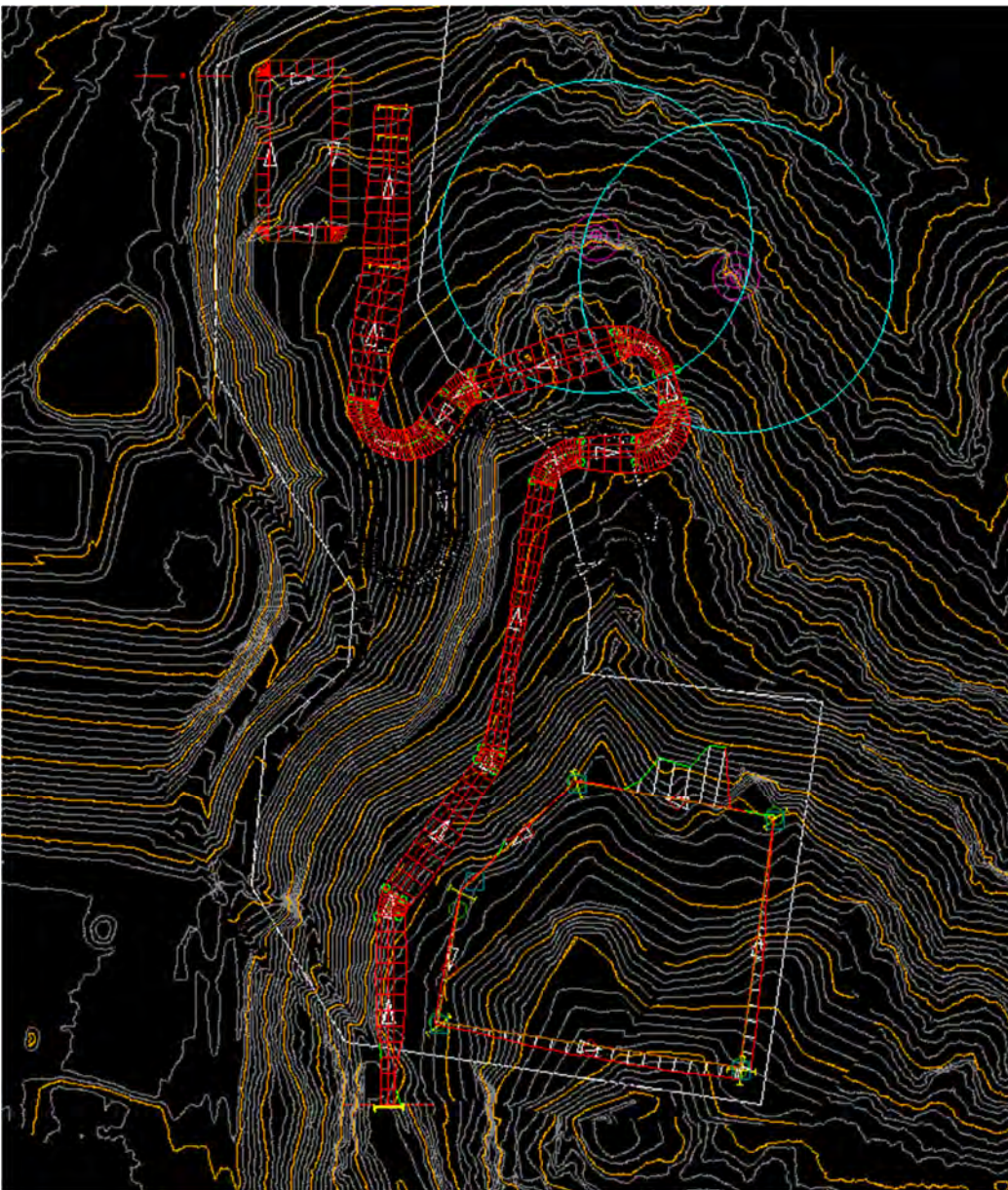


Figure B.14 Option 5 – Plan View 2

Option 6 - haul road outside of project boundary realigned

Option 6 is similar to option 5, however it has been horizontally realigned to accommodate the 50 m buffer zone allowed for the bat roosts. This option has a few more twists and turns than option 5, however it provides less construction works outside of the biodiversity boundary and provides slightly less tall batter slopes.

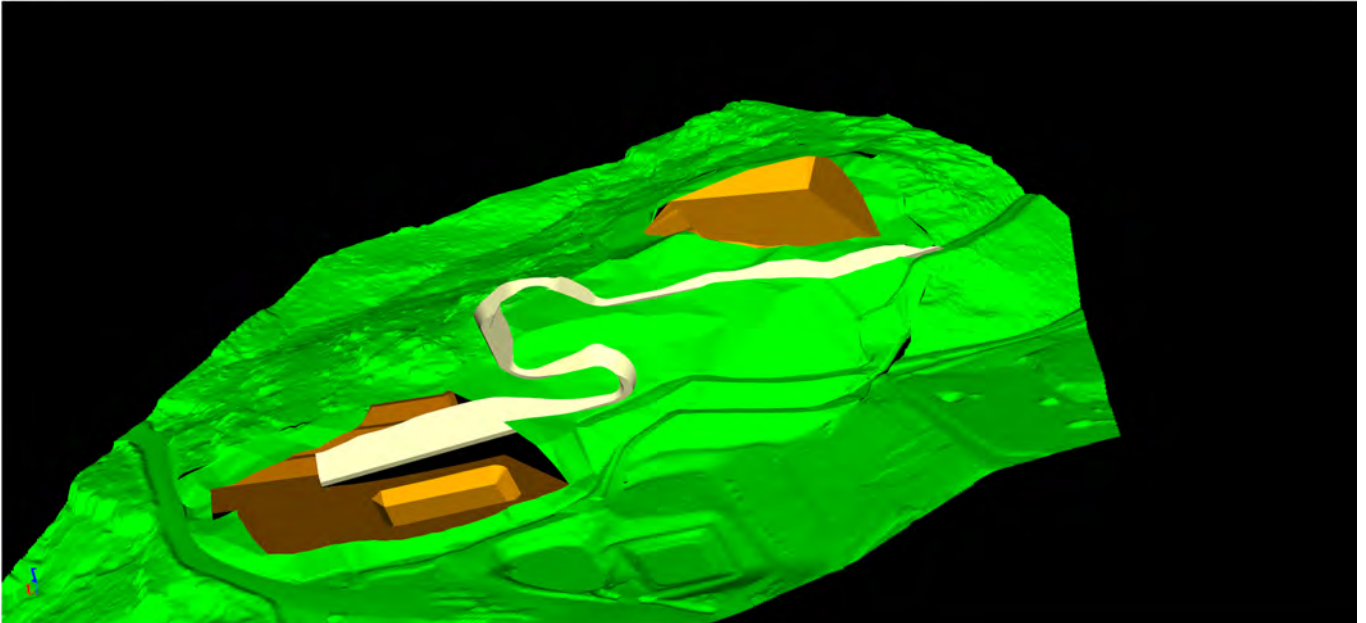


Figure B.15 Option 6 – Ortho View

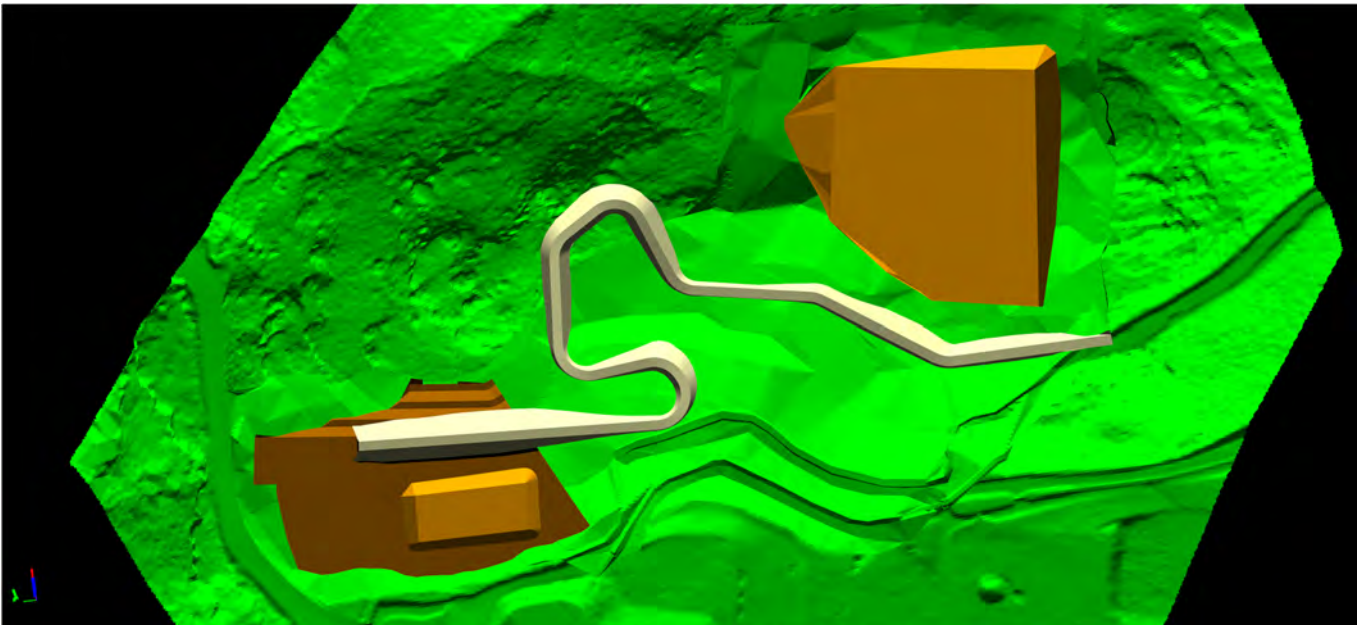


Figure B.16 Option 6 – Plan View 1

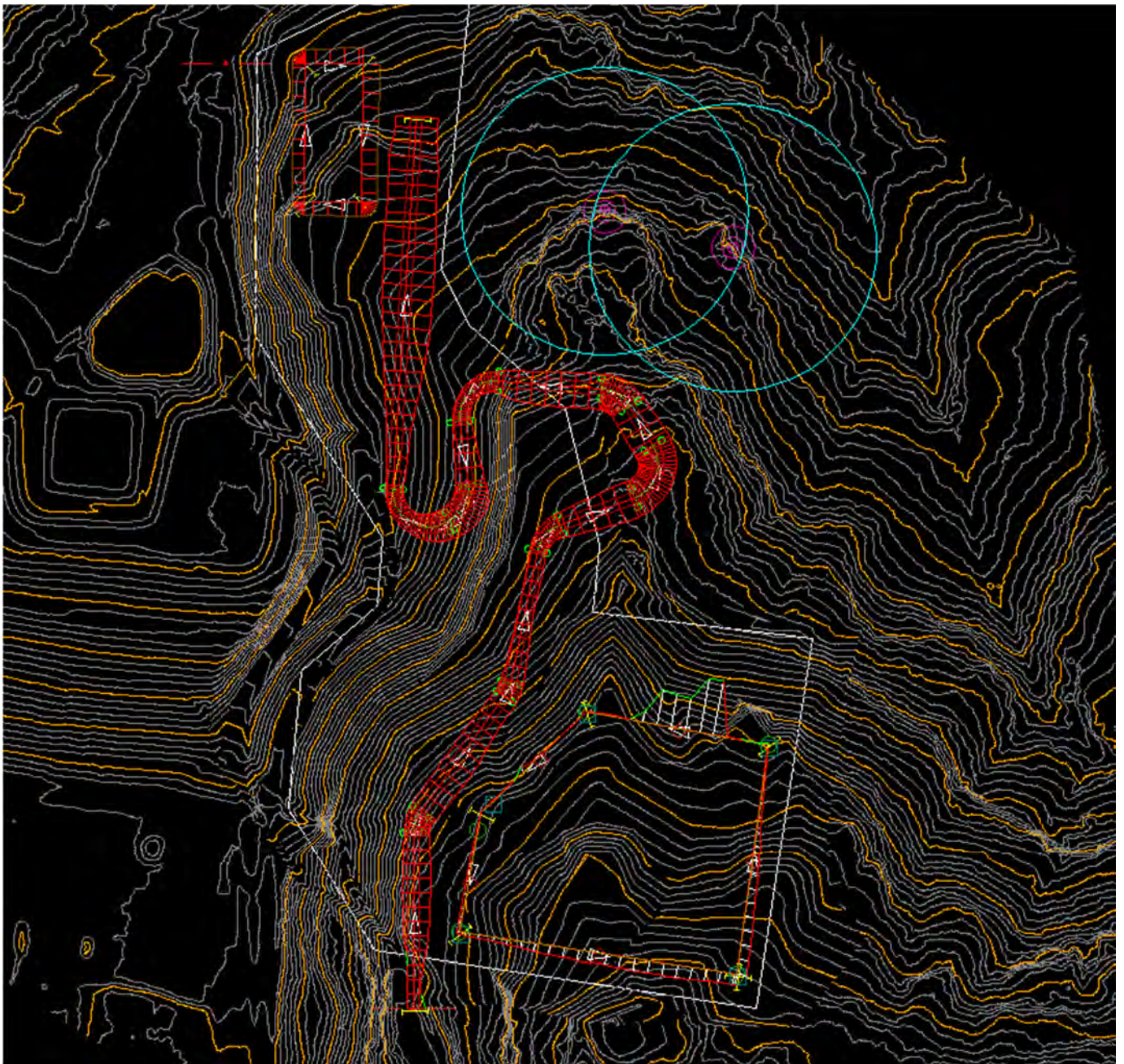


Figure B.17 Option 6 – Plan View 2

Option 7 – Dual entries from upper access point and transfer station platform (Adopted)

It was noted that there is an existing transfer station and the platform which it sits upon may be a good candidate for an entry point into the site. Similarly to option 3, this development uses a two-point entry system, meaning that haul road trucks will have to take a longer journey to travel from the lower sediment basin area to the upper stockpile area. To achieve this, the required route out of the area of works, back to the area of the works, will be approximately 860 m and 435 m of this will occur on the transfer platform where there will be external operations taking place.

The transfer platform is located approximately at RL 115 m, a level advised by Council. The haul road extending from the transfer station platform will lead to the lower sediment basin platform, and a second haul road will be utilised from the upper entry point at the camera pole to access the upper stockpile area.

Note that, shown in the 3D images below, the area external to the development site utilises LIDAR data taken before the transfer platform was raised to its current level. Therefore, the visualisation appears to not tie into the platform.

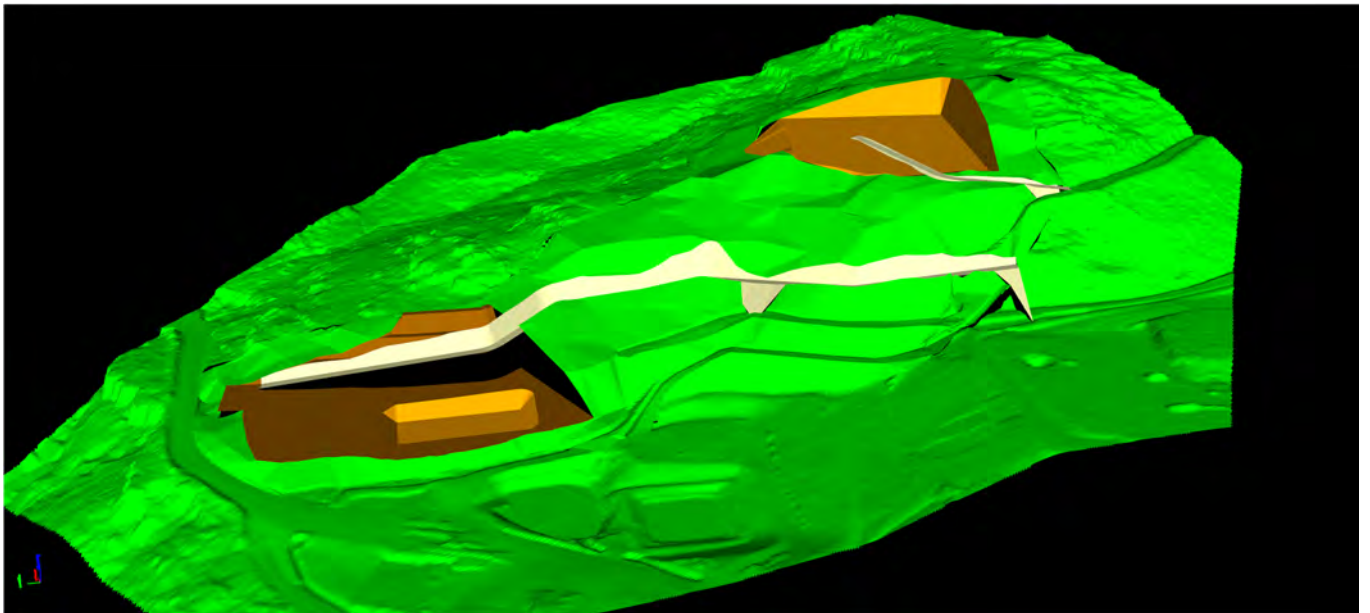


Figure B.18 Option 7 – Ortho View

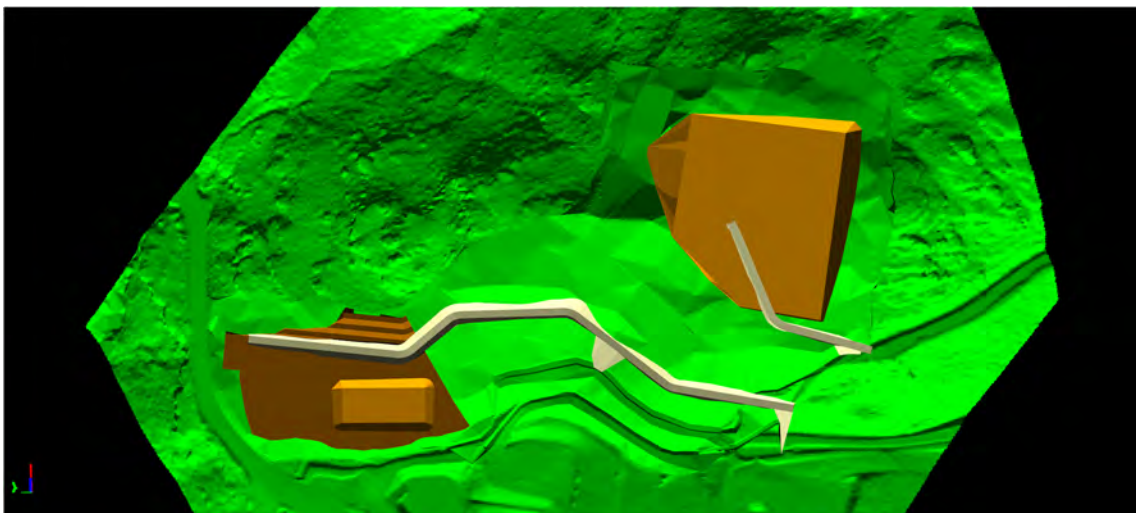


Figure B.19 Option 7 – Plan View 1

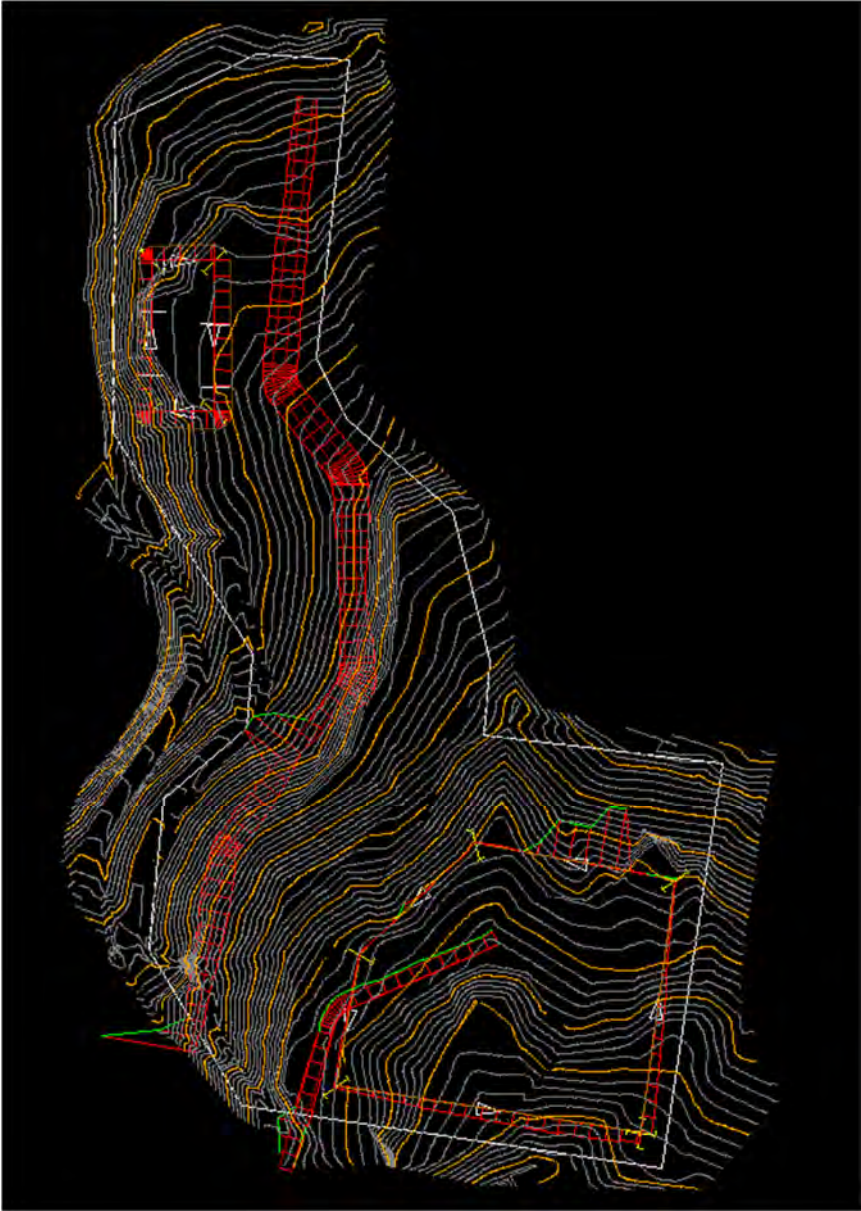


Figure B.20 Option 7 – Plan View 2



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