



Our Ref: PSM71-204L

12 April 2016

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ATTENTION: MARTY HUGHES  
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[Knowell.Madambi@oceanagold.com](mailto:Knowell.Madambi@oceanagold.com)

Dear Marty,

**RE: IMPACT OF THE CORONATION AND CORONATION NORTH WASTE ROCK  
STACK ON OPEN PITS**

This letter presents our assessment of the impact of the Coronation Waste Rock Stack (WRS) and of the proposed Coronation North WRS on the Coronation and Coronation North open pits.

## **1 INTRODUCTION**

The footprint of the two WRSs relative to the final open pits is shown in Figure 1. The following surfaces have been used in making this assessment:

- Coronation Pit – Stages 1 to 4 pit designs from July to August 2015
- Coronation North Pit – Stages 1 to 4 pit designs from August to September 2015
- Coronation WRS – Design from March 2013
- Coronation North WRS – Design from early 2016
- Topography – From October 2015

The following assessment has assumed that all stages of the pits will be excavated.

## **2 CORONATION PIT**

The Coronation Pit is bounded to the north by the Coronation WRS. Section 1 shows that the WRS toe is offset by 125 m from the pit crest (Figure 2). This offset decreases moving to the west of Section 1, however, the pit also becomes shallower.

The Coronation Pit is also bounded to the east by the southern portion of the Coronation North WRS. Section 2 shows that the WRS toe is offset by at least 80 m from the pit crest (Figure 2). The WRS is also down-dip of the pit.

Due to the relatively shallow pit depths in relation to the WRS offsets, the Coronation WRS and the Coronation North WRS will not compromise stability of the Coronation Pit slopes.

## **3 CORONATION NORTH PIT**

The Coronation North Pit is bounded to the East by the Coronation North WRS. Section 3 shows that the WRS toe is offset at least 180 m from the pit crest (Figure 3). The Coronation North WRS will not compromise stability of the Coronation North pit slopes.

The Coronation North Pit is also bounded to the south by the Coronation WRS. Section 4 shows that the proposed WRS extends more than 200 m into the proposed pit (Figure 3). To allow full excavation of the pit, the WRS toe must be moved south.

Furthermore, Section 4 shows that the foundation is relatively steep and dips at up to 30° behind the final pit crest. The steep dips are associated with a number of incised gullies which run through the area (Figure 4).

If the WRS toe is relocated to within close proximity of the proposed pit crest, there is potential that the steep foundation conditions may trigger instability. It is therefore recommended a minimum offset of 200 m be applied between 69500 E and 69800 E to avoid the steep terrain. To the west of 69400 E, and to the east of 69900 E, the offset can be reduced to 100 m due to more favourable foundation conditions. From 69400 E to 69500 E, and from 69900 E to 69800E, the offset should be varied linearly from 100 m to 200 m (Figure 4).

When constructing the eastern portion of the WRS, the gully in Area A (between the 100 m and 200 m offsets) should be infilled prior to construction of the WRS in Area B (outside the 200 m offset; Figure 4). The placement of material into Area A will act as a buttress for material placed on the steep foundation in Area B. Other gullies, such as those located in Area C and Area D, should also be infilled. This should be done by tipping material along the gully, rather than across the gully to avoid potential instabilities associated with the steep gully walls.

#### 4 WRS FOOTPRINT

It is appreciated that moving the northern toe of the Coronation WRS to the south will reduce volumes. To offset this loss whilst still providing short haul options and the same maximum RLs, offsets between both WRSs and the pit crests could be reduced to a minimum of 100 m in most locations. The exception is for the northern toe of the Coronation WRS, which due to the slope of the topography between 69500 E and 69800 E, should be offset at least 200 m from the Coronation North Pit. WRS offsets and potential areas for additional space are shown in Figure 5.

We trust this letter meets your requirements. Should you have any further questions, please contact the undersigned.

For and on behalf of  
PELLS SULLIVAN MEYNINK

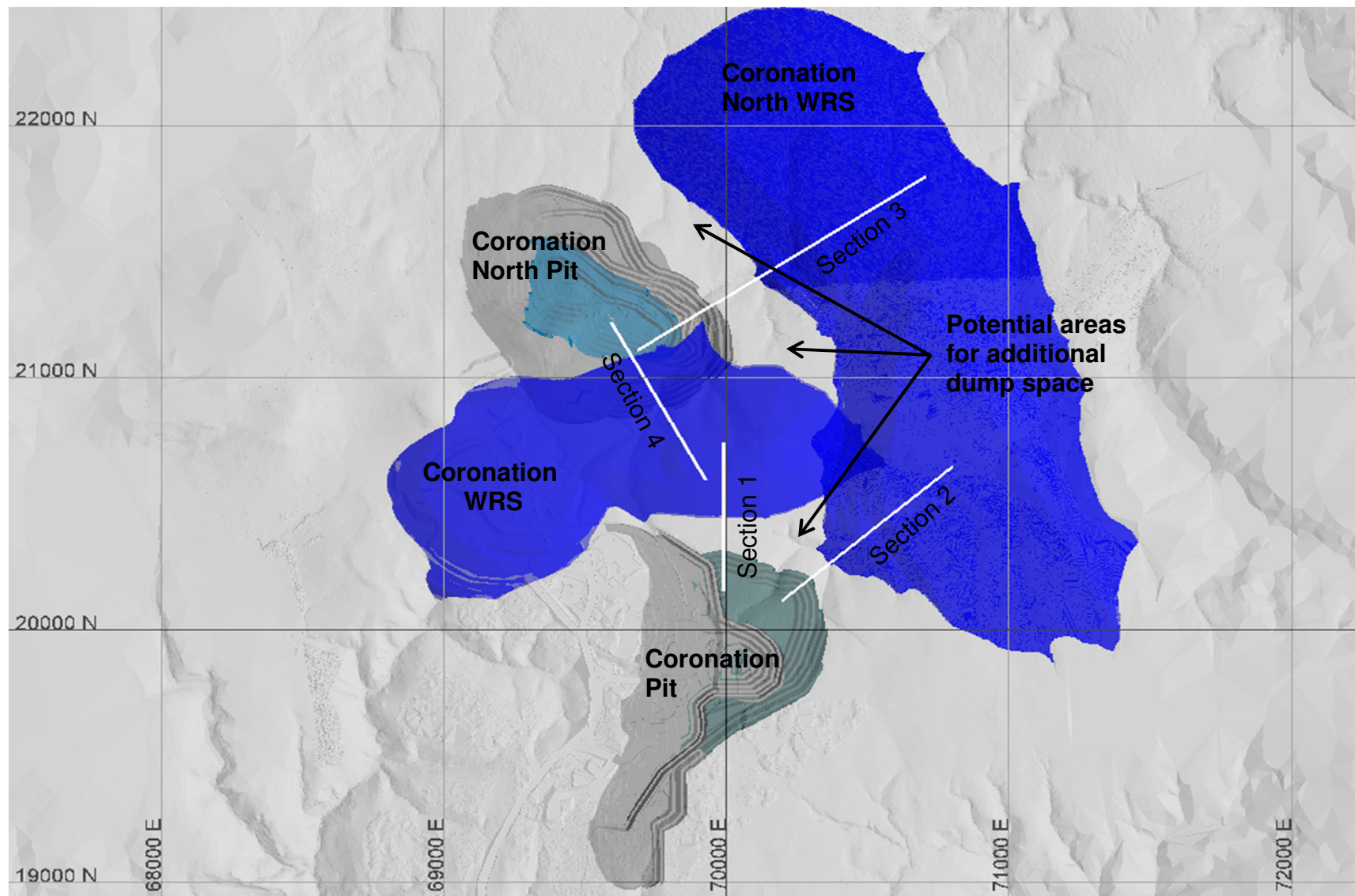


KAI KOOSMEN  
Senior Engineer



ROBERT BERTUZZI  
Principal Engineer

Encl: Figure 1 Key Section Locations for the Assessment  
Figure 2 Section 1 and Section 2 through the Coronation Pit  
Figure 3 Section 3 and Section 4 through the Coronation North Pit  
Figure 4 Foundation Conditions Immediately South of the Coronation North Pit  
Figure 5 Offsets and Potential Areas for Additional Storage Space



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**Coronation and Coronation North Pits**  
**Waste Rock Stack Assessment**

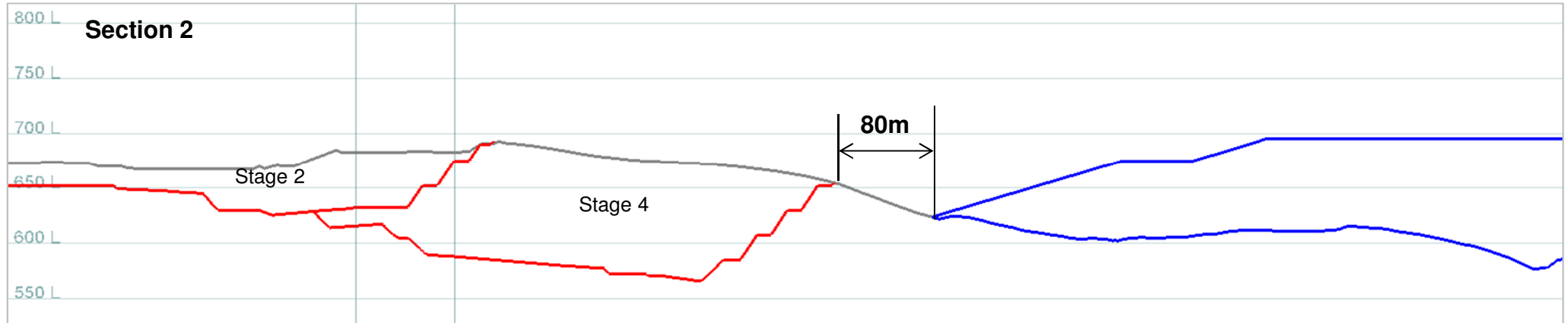
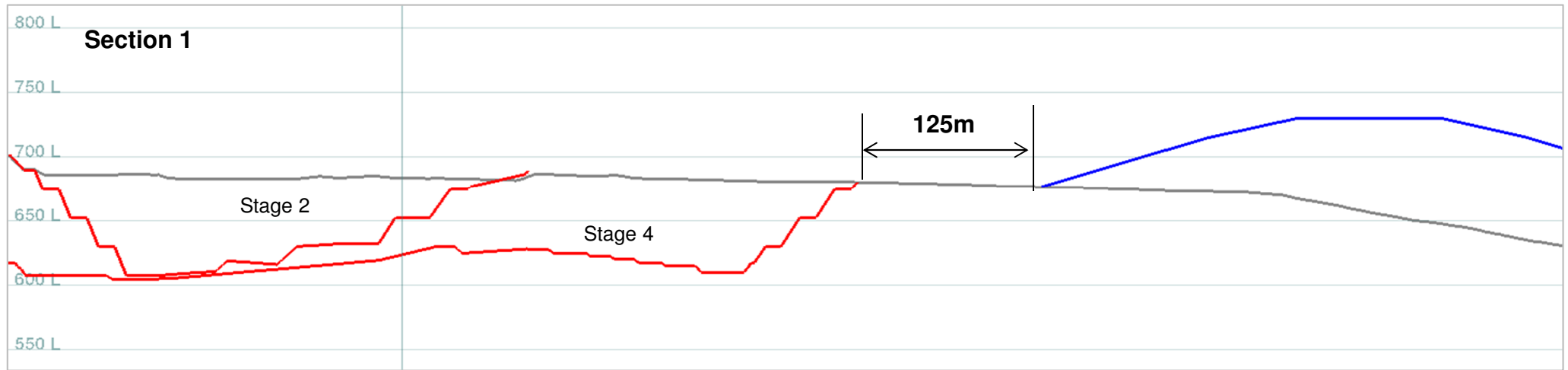
**KEY SECTION LOCATIONS FOR**  
**THE ASSESSMENT**



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**Figure 1**



- Waste Rock Stack
- Staged Pit Designs
- Topography (October 2015)



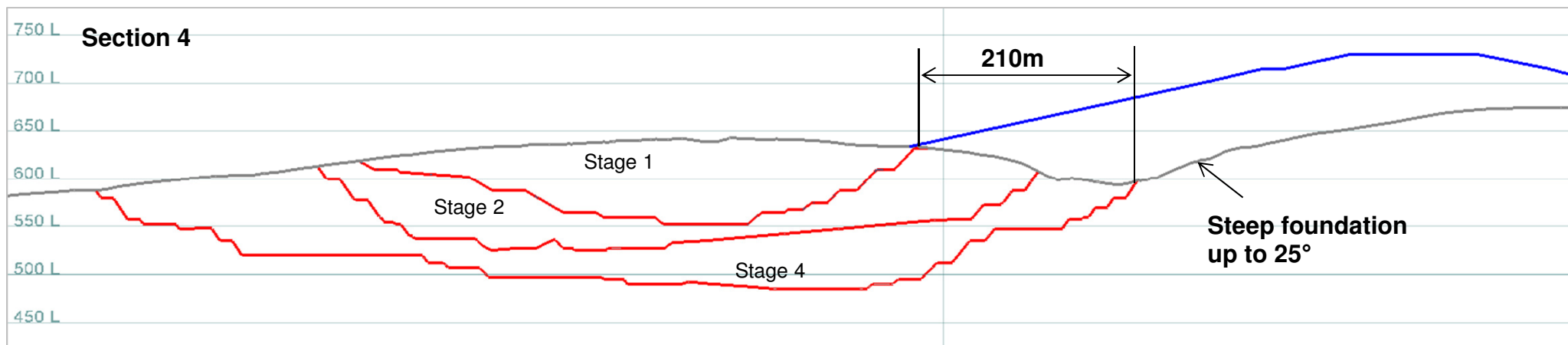
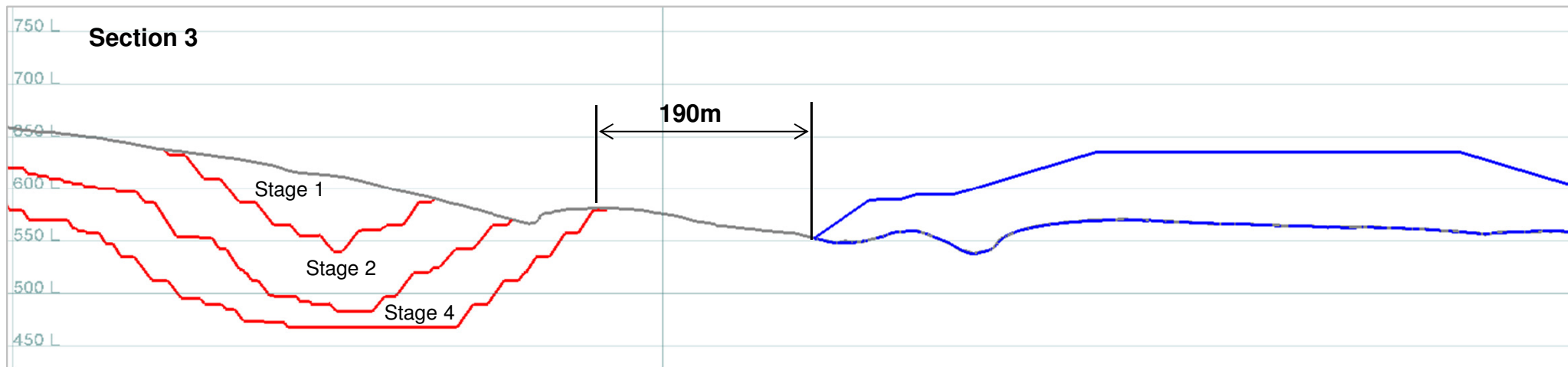
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**SECTION 1 AND SECTION 2**  
**THROUGH THE CORONATION PIT**

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Figure 2



- Waste Rock Stack
- Staged Pit Designs
- Topography (October 2015)



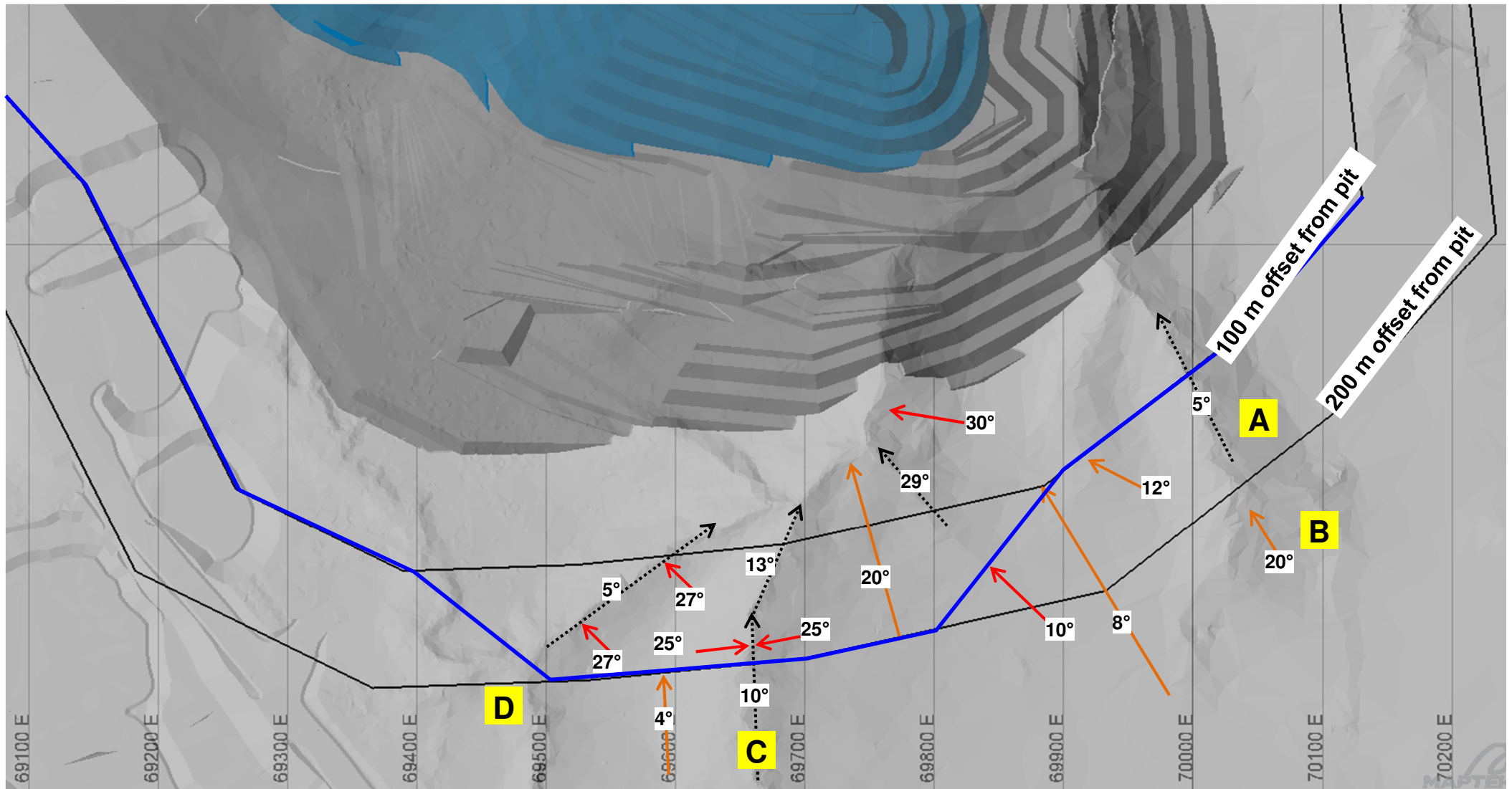
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**SECTION 3 AND SECTION 4**  
**THROUGH THE CORONATION NORTH PIT**

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Figure 3



- .....→ Dip and dip direction along gully
- Dip and dip direction of gully wall
- Dip and dip direction along spur
- Proposed WRS toe
- A Area referenced in text



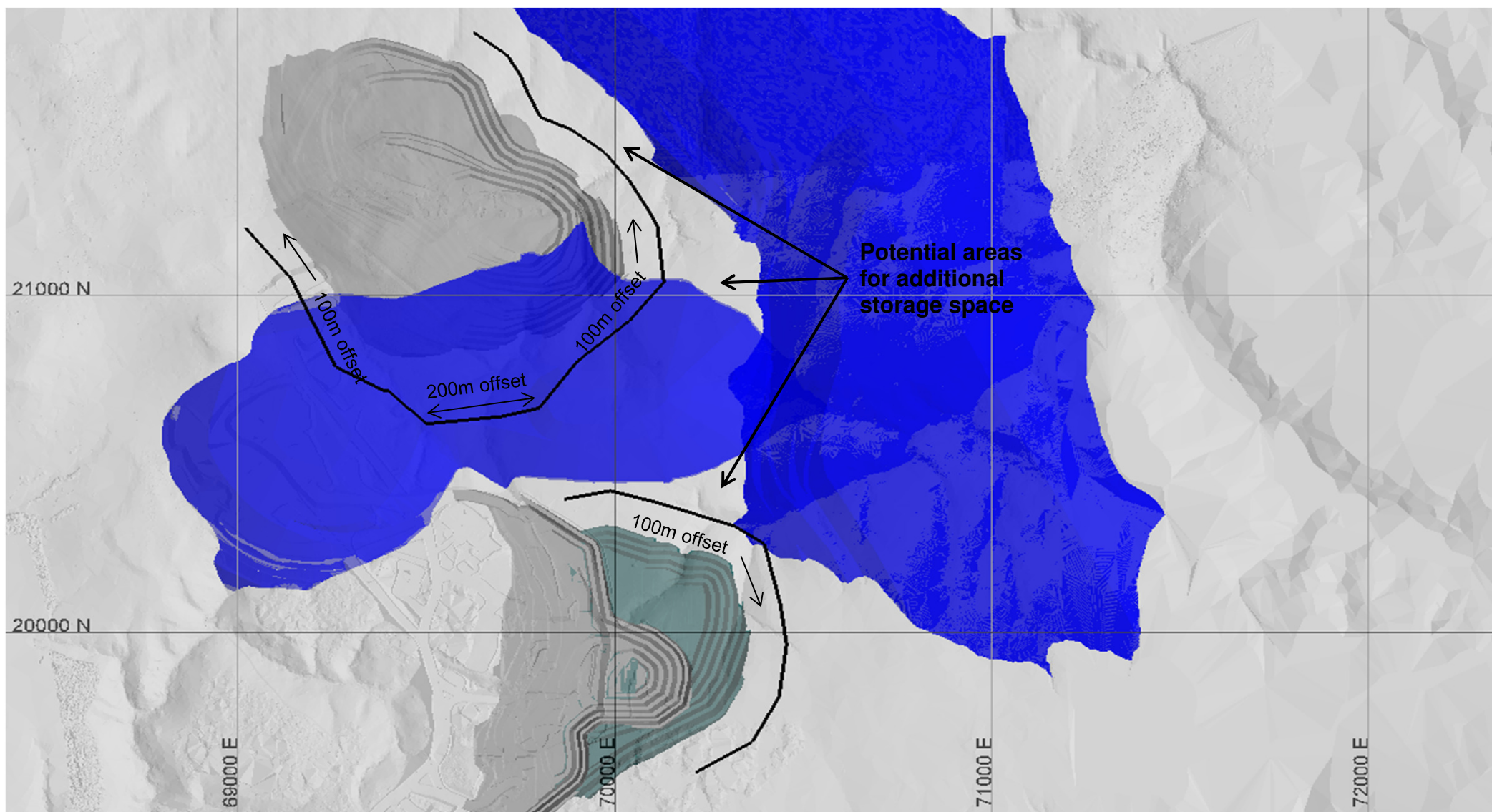
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**FOUNDATION CONDITIONS IMMEDIATELY**  
**SOUTH OF THE CORONATION NORTH PIT**

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Figure 4



See Figure 4 for exact locations over which the 200 m offset is required



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**OFFSETS AND POTENTIAL AREAS**  
**FOR ADDITIONAL STORAGE SPACE**

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Figure 5