



## **REALIGNMENT OPTION ANALYSIS**

The majority of the proposed pipeline route follows the existing electrical servitude as far as practicably possible. Due to the built up nature of the surrounding project area, this was the only route identified for the proposed pipeline from an engineering perspective, and which would have the least environmental and social implications.

However, along various sections of the pipeline route, four site deviations or alternatives to the proposed route have been identified taking into consideration social, environmental and technical concerns. The no-go alternative has also been considered. The assessment of these alternatives have been described in detail in Section 4 of this Basic Environmental Assessment Report and the Route Option Analysis Report, which is found under Appendix G. The potential environmental and social impacts along the proposed route and the deviations remain the same.

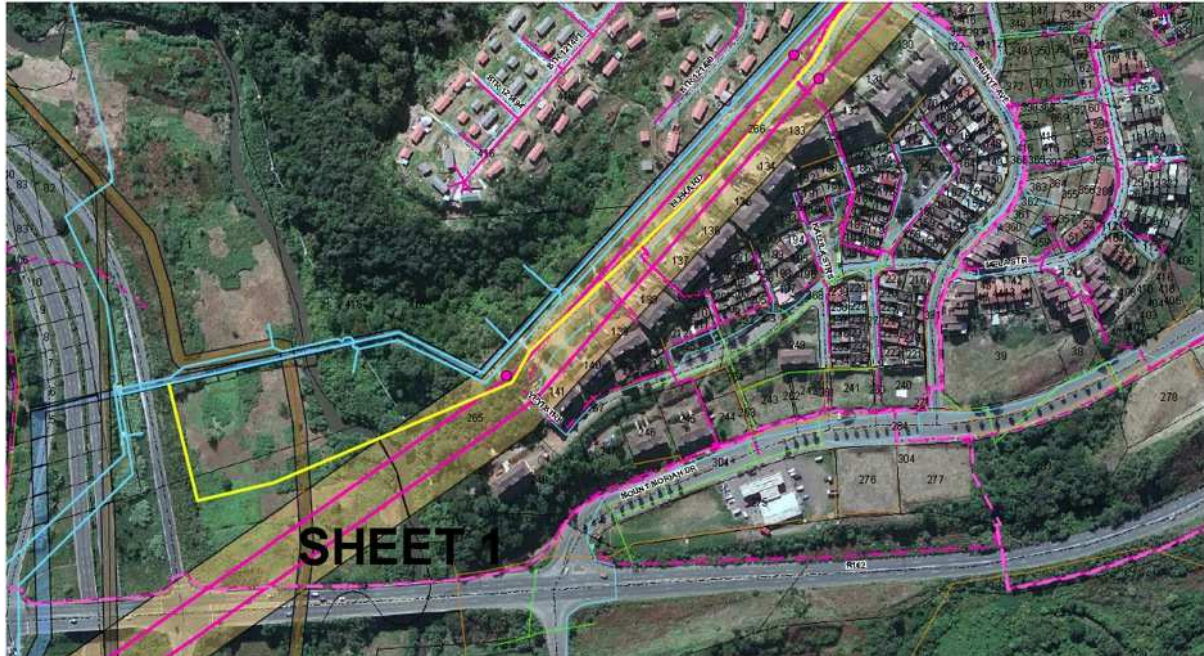
These changes exist on Sheets 1, 2, 3 and 6 of the NAA Phase 4 Mapbook.

The four changes, together and their descriptions are tabulated below.



## MAPBOOK SHEET 1 ALTERNATIVES CROSSING OF THE PIESANG RIVER AND ADJACENT ELEKA ROAD

**Original Proposed Route (in yellow)**



**Alternative 2 - Preliminary  
Design Level Route  
(Original proposed route)**

**Sheet 1:** The original route was proposed to cross the Piesang River closer to the existing pipeline, and then traverse the steep bank along the existing servitude and adjacent to Eleka Road, and the residences between Yeyi Road and Simunye Avenue

**Preferred Alternative Route (in yellow)**



**Alternative 1 - Engineers  
'Preferred' option**

**Sheet 1:** The preferred option takes into consideration the steep bank next to the Piesang River, and instead proposes crossing the river further south, closer to the R102, so that the pipeline can be laid within the road servitude of Mount Moriah Drive. Just after the Engen garage, the proposed route turns left (north) into Simunye Ave, and follows Simunye until the intersection with Eleka, after which the two route options converge.

**Reason for Route Change**

1. The steepness of the bank exiting the Piesang River
2. Fairly narrow / constricted access along Eleka Road suggested that a better alternative



should be found.

3. Children play in Eleka Road; this would pose a safety hazard during construction.

4. The only access to the homes in Eleka Road is via Eleka Road, no other alternatives exist – the drop off from Eleka Road into each of the residences (council owned low cost housing) is very steep.

The preferred route is now along Mount Moriah Drive.



**Section of Piesang River showing the steep bank near Eleka / Yeyi Road.**

#### **Brief Assessment**

This route makes sense as the very steep, and potentially erodible bank of the Piesang River will be avoided. The river still has to be crossed; this is proposed a few metres further south. The new crossing point is less steep, and has already been disturbed by the construction of the road.

The vegetation in the region of initially proposed route is very disturbed and may have benefited from the rehabilitation actions which would follow pipeline construction. The overall environmental impact is likely to be diminished by the Engineers 'preferred' option (avoidance of steep bank).

Geotechnically, there appears to be no preferred route.

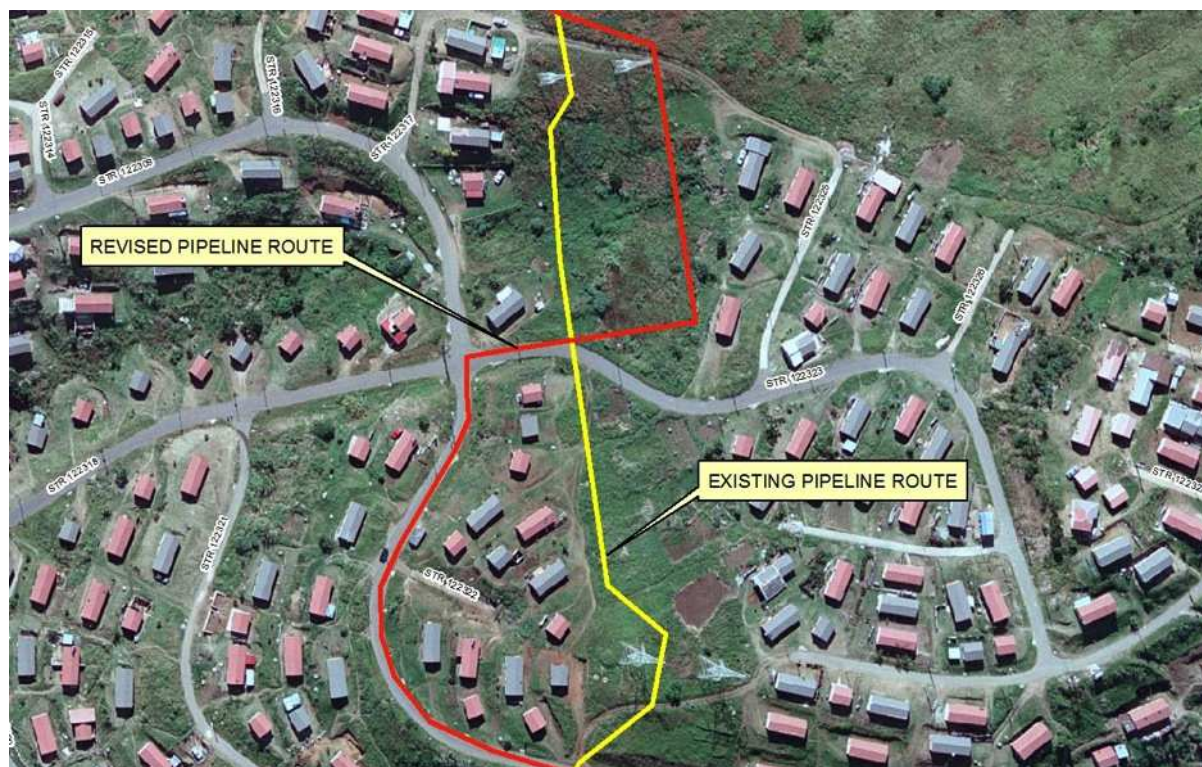
The social impact can not readily be determined: a tossup between children playing in Eleka Road being exposed to safety issues during construction, or motorists on Mount Moriah Road being inconvenienced or delayed during construction, as the access road to Mount Moriah will be disturbed. Access along these roads (including Simunye Road) will be limited, but will not be entirely prevented. Residents will always have access to their homes and businesses, either via a stop go system or via alternative routes.



## MAPBOOK SHEET 2 ALTERNATIVES

### PROPOSED ROUTE ALONG STREET 122309 and STREET 122318

Original Proposed Route (in yellow) and Preferred Alternative Route (in red)



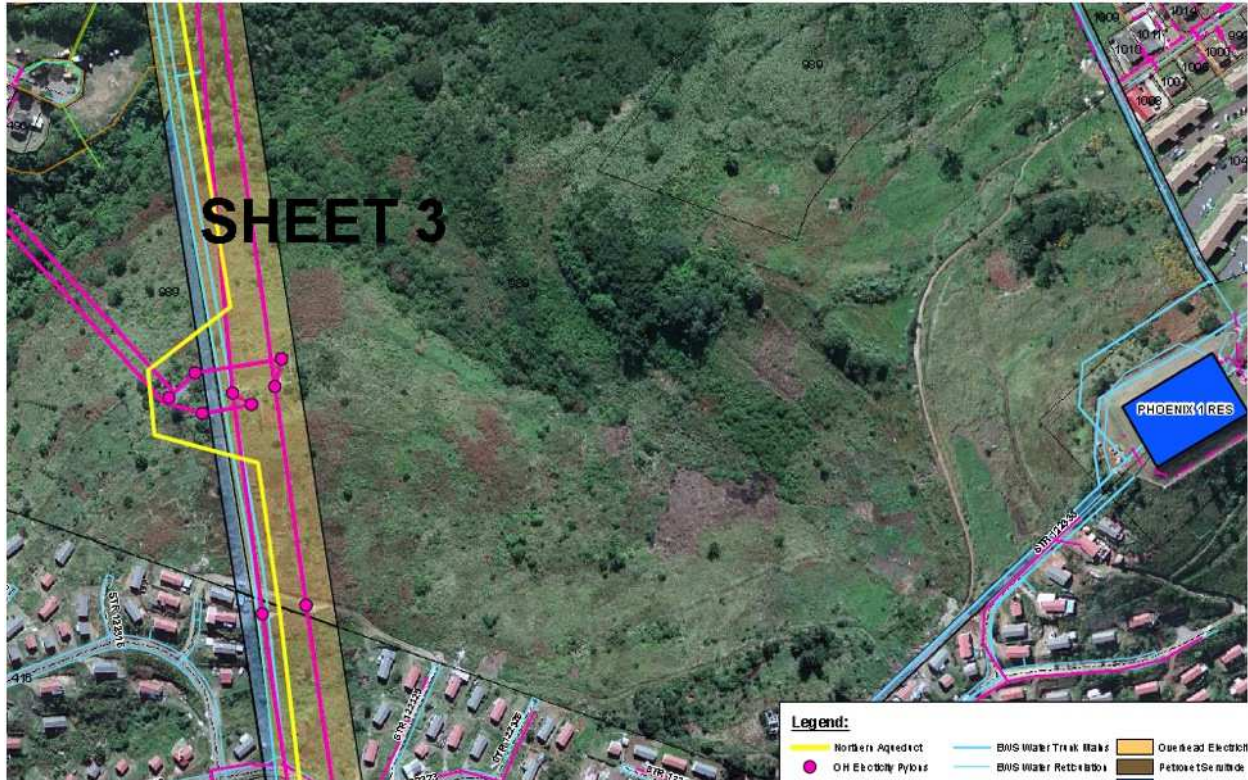
<b>Alternative 2 - Preliminary Design Level Route</b> <b>(Original Proposed Route)</b>	<b>Sheet 2:</b> The original route was proposed to follow existing electrical servitude traversing across open space.
<b>Alternative 1 - Engineers 'Preferred' option</b>	The preferred option will turn left (west) and make a hair pin bend along Street 122309 travelling within road pavement for approximately 180m, before turning right (east) into Street 122318, where the pipeline, located within the road pavement will traverse for approximately 34m before turning left again (north) to rejoin the original proposed route within electrical servitude.
<b>Reason for Route Change</b>	The existing proposed pipeline route was contained within the eThekwin Electrical servitude. Following a meeting with the electricity department, a request was made by the department to revise the pipeline route such that the pipeline is not located between the electrical pylons.
<b>Brief Assessment</b>	<p>The option of routing the pipeline on either side of the electrical servitude was investigated. In both these options, the construction activities associated with the construction of a DN1200 pipeline would impact on the structure of adjacent houses. Therefore the alternative route within road reserve, for this portion of the proposed route, was sort.</p> <p>The social impact of this change will affect access on Street 122309 and Street 122318 temporarily. Alternative access routes will be sort in the Transport Management Plan (TMP) during the construction period to satisfy the access needs of commuters.</p>





## MAPBOOK SHEET 3 ALTERNATIVE LINK BETWEEN DUFF'S ROAD AND PHOENIX 1 RESERVOIRS

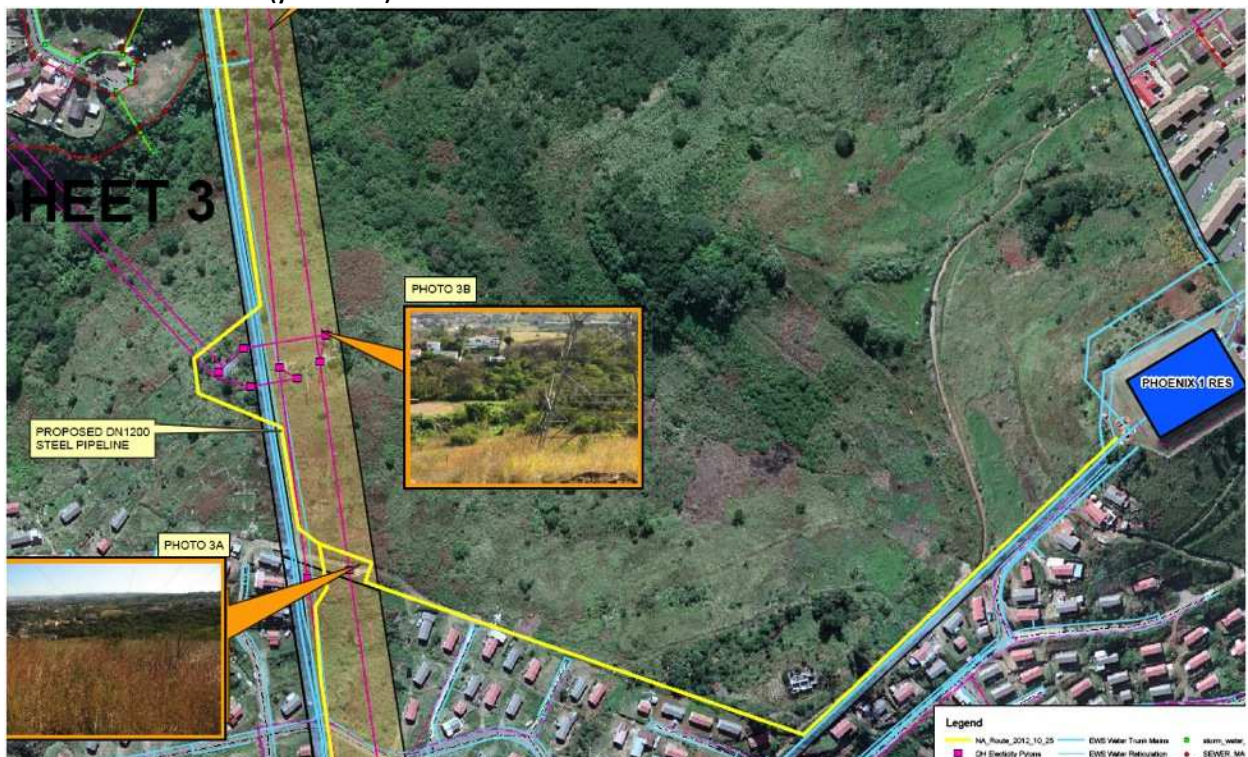
Original Proposed Route (in yellow)



**Alternative 2 - Preliminary  
Design Level Route  
(Original Proposed Route)**

**Sheet 3:** The original route was proposed as a straight line through the open veld of Erf 989. The NAA (previous EIA – ROD issued) had a portion of route through Mount Moriah from Duffs Road to Phoenix 1 reservoir (Sheet 46 of the NAA EIA Map Book – see further below).

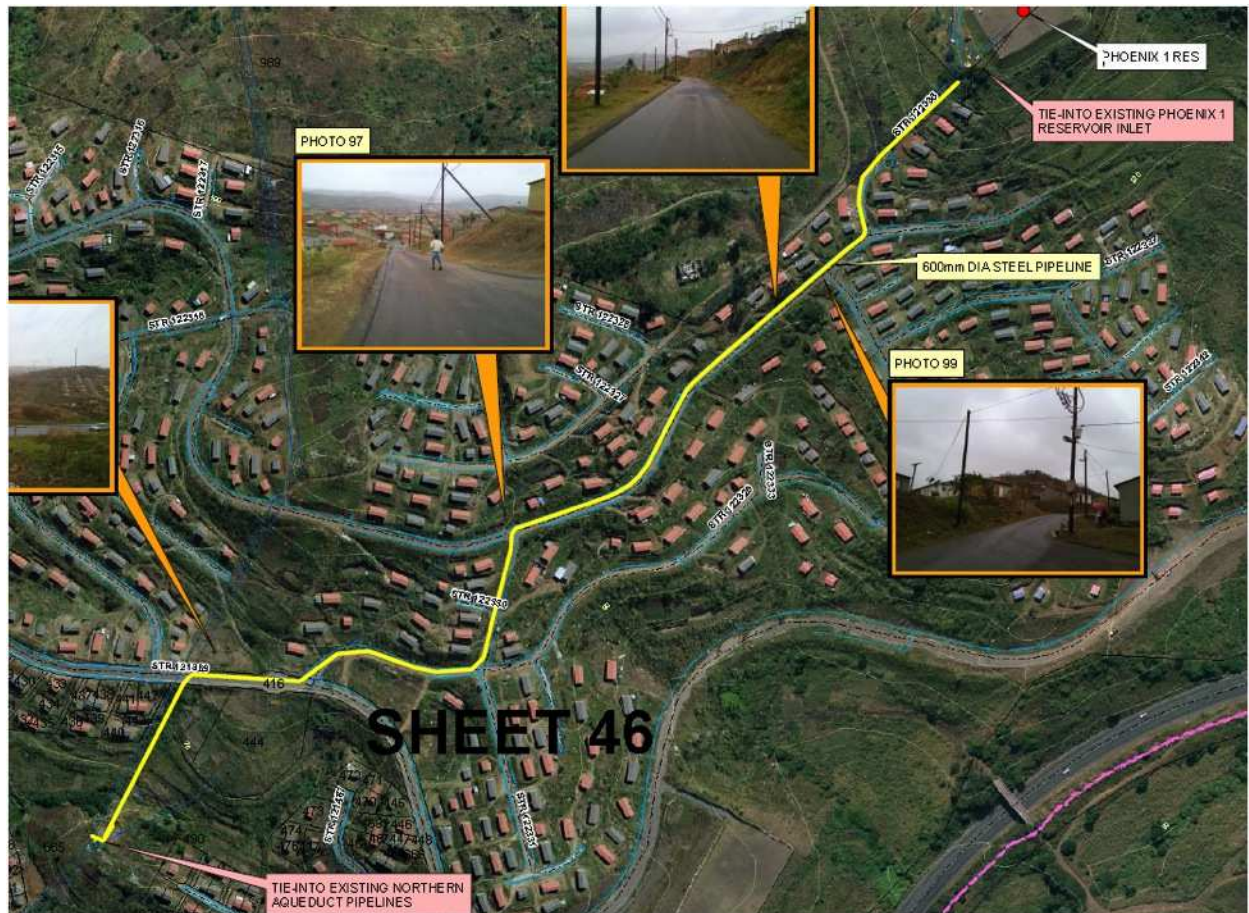
Preferred Alternative Route (yellow line)







<b>Alternative 1 - Engineers 'Preferred' option</b>	<b>Sheet 3:</b> The preferred option is routed within the existing servitude, as above, but also has a link coming from Phoenix 1 Reservoir, which will negate the requirement for a longer section of pipeline within the roads of Mt Moriah See Figure below which shows the already authorised section of pipeline in pink (RHS of figure) which will no longer be required if this portion is added to the NAA Ph4 project and removed from the initial NAA project.
<b>Reason for Route Change</b>	See figures below for an explanation.



Sheet 46 from the original NAA EIA Map Book – showing the link from Phoenix 6 Reservoir to Phoenix 1 Reservoir.



The figure above illustrates the two Proposed NAA routes (combination of Sheets 3 (NAA Ph4) and Sheet 46 from the NAA Ph1 EIA) between Phoenix 6 and Phoenix 1 Reservoirs. In pink (RHS of diagram) the *already authorised NAA link* between P6 and P1, and in yellow (LHS route) the currently proposed NAA Ph4 route. The decision to undertake NAA Ph4 has opened up the opportunity to re-route the NAA through Mount Moriah along a better alignment (within the servitude and open veld and not along the roads of Mt Moriah).

#### Brief Assessment

Since the newly proposed NAA Ph4 is passing close to the already authorised NAA Ph1, and the adoption of the now proposed Ph4 route is shorter and less of an inconvenience for residents, and construction workers, and rehabilitation should be much easier, the newly proposed Ph4 route is preferred. Environmental and social impacts should be greatly reduced.

Geotechnically, there appeared to be no preferred route.

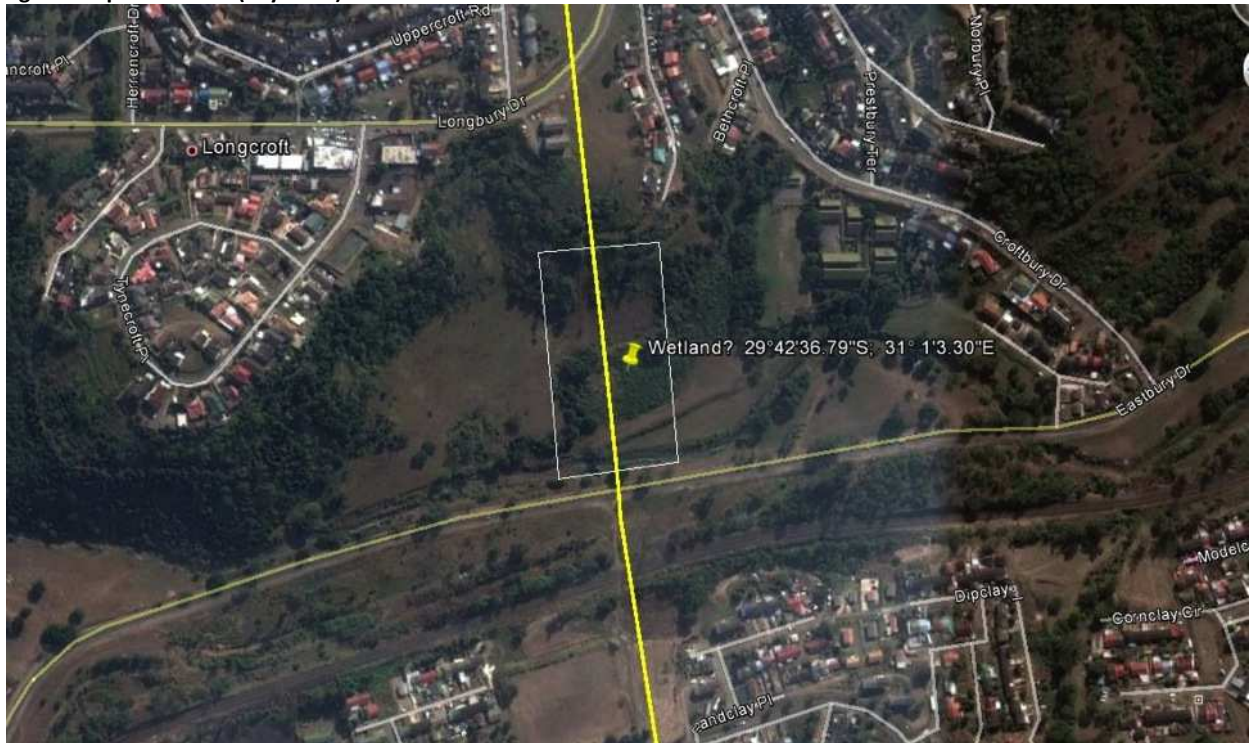
This route change occurred early on in the Basic Assessment process, and as such specialists and IAPs were informed of the change at an early stage. The alternative route has thus been assessed, and not the Preliminary Design Level Route.





## MAPBOOK SHEET 6 ALTERNATIVES EASTBURY DRIVE WETLAND

Original Proposed Route (in yellow)



**Alternative 2 - Preliminary  
Design Level Route  
(Original Proposed Route)**

**Sheet 6:** The original route was proposed to follow existing electrical servitude traversing across a Wetland which is historically known as *Pickersgill's Reed Frog* habitat.

**Alternative Route Proposal – Two alternative options were presented to the Design Engineers in RED (Route 1) and BLUE (Route 2)**





<b>Alternative 1 - Engineers 'Preferred' option: Route 1</b>	<p>The proposed preferred alternative turns and runs in a westerly direction for 200m along Eastbury Drive. It then crosses Eastbury Drive and traverses 475m of terrestrial grassland area before crossing a drainage line and re-entering the existing electrical servitude.</p>
<b>Alternative 3 - Engineers 'Not Preferred' option: Route 2</b>	<p>The route turns East at Eastbury Drive and runs 520m to the intersection with Croftbury Drive. Here the route turns north and continues within the road surface of Croftbury Drive for 720m until reaching the road reserve of Longbury Drive.</p>
<b>Reason for Route Change</b>	<p>Recommendations made in the Biodiversity Report compiled by Dr Edmund Granger, and the Frog Specialist Study Report compiled by Dr Jeanne Tarrant prompted Ezemvelo KZN Wildlife to request that the wetland near Eastbury Drive not be impacted upon. This wetland is historically known as <i>Pickersgill's Reed Frog</i> habitat.</p>
<b>Brief Assessment</b>	<p>Only two route alternatives exist around the "Eastbury Drive" Wetland. The two options were presented to the design engineers for technical input.</p> <p><b>Preferred Alternative Route: Route 1</b> Route 1 adds 300m to the original route which equates to R6million in additional cost. The project team are confident that adequate rehabilitation of terrestrial grassland area can be achieved as per our commended rehabilitation achieved on the Western Aqueduct Phase 1 project.</p> <p><b>Not Preferred: Route 2</b> Route 2 adds 1280m to the original route which equates to R25.6m additional cost. With the road width of Croftbury Drive being 6m wide, complete road closure will be required during construction to facilitate the large construction vehicles and ensure public safety. The rate of progress of construction along the road would necessitate the road closure for approximately 3 months. Croftbury Drive is the only link between Eastbury and Longbury Drive and the shortest alternative is 3.5km in length. The closure of Croftbury Drive will have a devastating effect on traffic flow in the area and as a suitable alternative exist, is not the preferred route.</p>

## THE NO-GO ALTERNATIVE

<b>The no-go alternative</b>	The no-go alternative has also been considered.
<b>Brief Assessment</b>	The NAX is presently operating very close to its maximum capacity and does not have spare capacity to supply the new developments such as Cornubia therefore, the no-go alternative would not meet the needs of the future demand for water supply in these new developments. This situation will continue if the no-go alternative is taken.