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24 April 2022

Our reference: Wetland Risk Assessment Virginia Power line Updated 24Apr2022.docx

Pieter Colyn
Green Environmental

Dear Sir

Re: Wetland Risk Assessment – 33 kV Power Line, Virginia – Free State

I, Willem de Frey, ID no 690508 5025 08 2, a registered scientific professional in the fields of ecological – and botanical science (registration no: 400100/02) with more than 20 years' experience completed the risk assessment, as per requirement of the wetland risk assessment matrix. This document represents an update of the document compiled in September 2021, based on additional information provided regarding the location of the pylons, the availability of wetland delineation information for a gas pipeline and the actual nature of the pylons. The additional wetland information resulted in a second survey on 7th and 8th of April 2022 to refine the boundary of the wetlands in proximity of the pylon positions (Appendix B).

The proposed development concerns a 33 kV power line, near Virginia in the Free State (Figure 1). To verify the presence and/ or absence of wetlands near the proposed power line, a site visit was done on the 8th of September 2021. During the site visit, the soil was augured up to a depth of 1.2 m using a handheld soil auger at sites based on the wetness index model. The model was derived from a Digital Elevation Model (DEM) generated from 5 m contours (Figure 2). In addition, georeferenced digital images were taken at the eleven observation sites (Appendix A).

Figure 3 and Figure 4 provide large scale images of the soil forms recorded, which confirms that observation points 2, 3, 4 and 7 are associated with at best temporary wetlands. The soil profile becomes temporarily saturated with moisture during mean and above mean annual rainfall events. During below mean annual rainfall events the soil moisture would be at field capacity or wilting point depending on the magnitude of the below mean annual rainfall event. The site visit during April 2022 confirmed the temporary nature of the wetlands (Appendix B).

Therefore, it is concluded that the proposed 33 kV power line towers (Photo 1), will have no influence on surface water movement associated with watercourses as the power line is located mainly beyond 100 m of watercourses (Figure 2), and will have insignificant influence on soil moisture within the soil profiles as the soil moisture is dependent mainly on the annual rainfall, which in mean and above mean annual rainfall events will result in temporary saturated and over saturated conditions. The presence of cultivated fields in the vicinity of observations sites 2, 3 and 4 (Appendix A) supports this statement. It is also highly probable that the runoff from the tar road adjacent to these sites contribute to an increase in soil moisture in these areas, resulting in localised, temporary saturation of these areas.

The proposed power line is located along existing road infrastructure whether provincial - (Photo 2), farm - (Photo 3 and 4) and mining roads (Photo 4), therefore the delivery of the construction material will not add

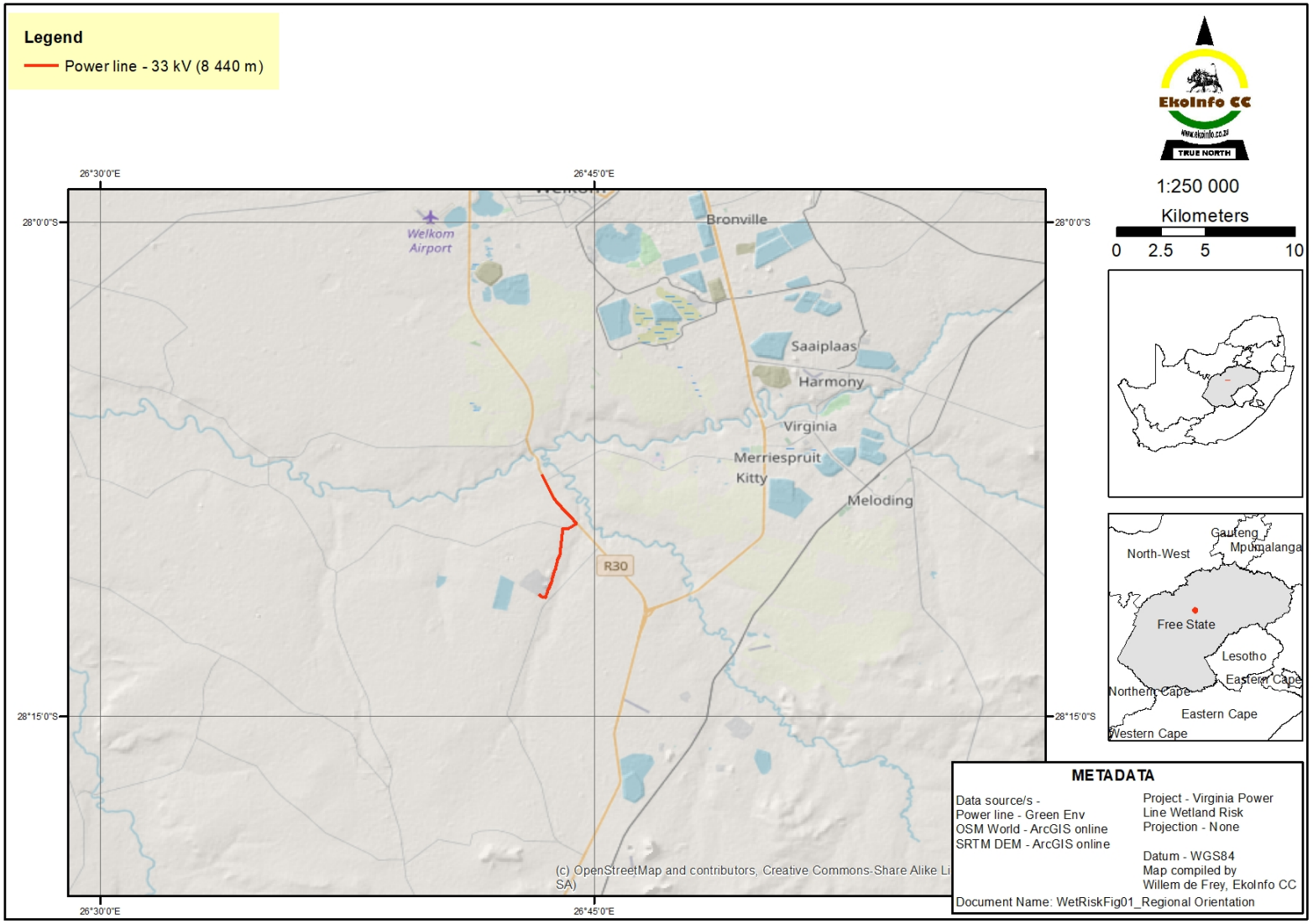


Figure 1: Regional orientation of the proposed 33 kV powerline near Virginia, Free State Province – South Africa

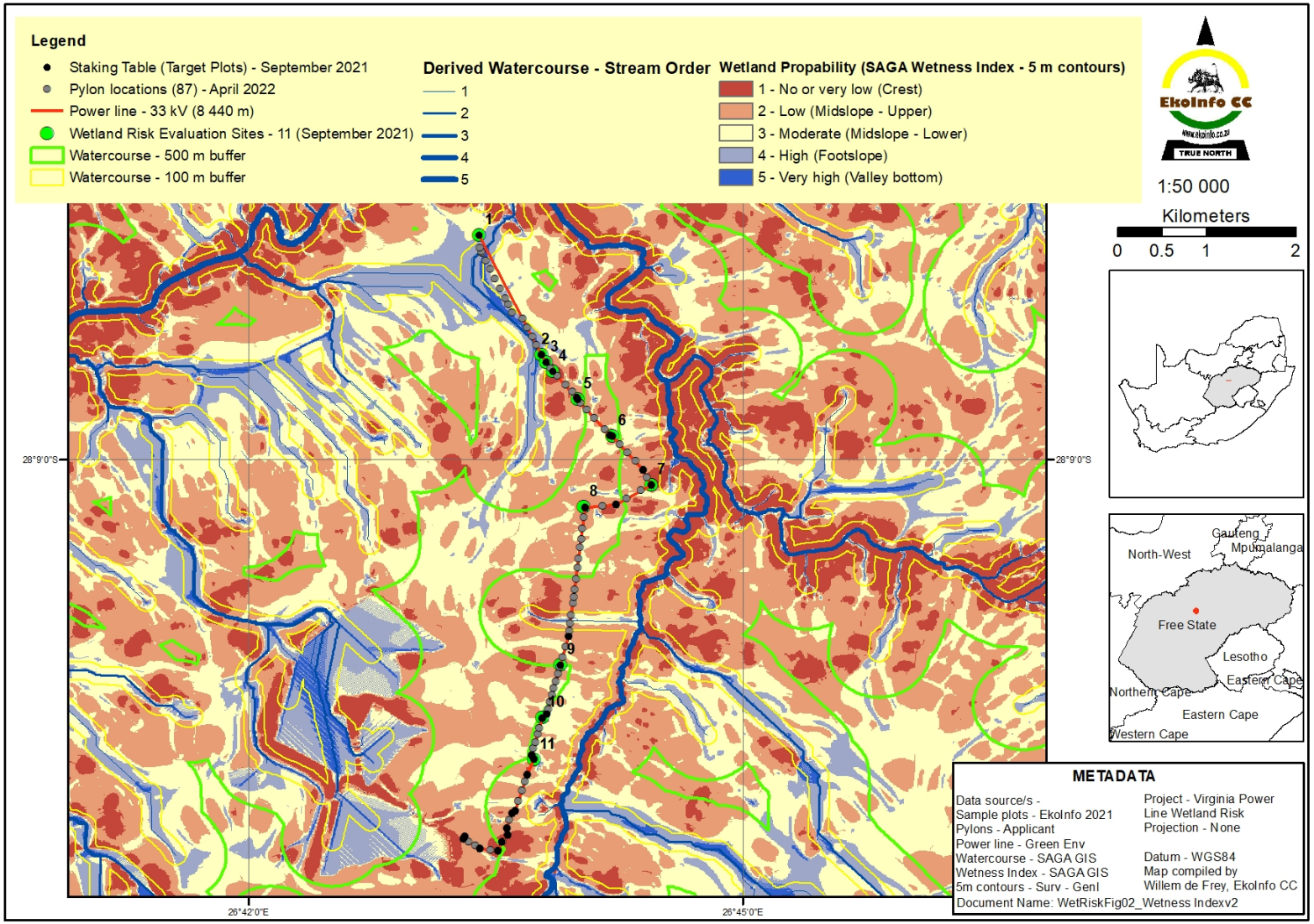


Figure 2: Targeted wetland evaluation points based on the wetness index results derived from 5 m contours

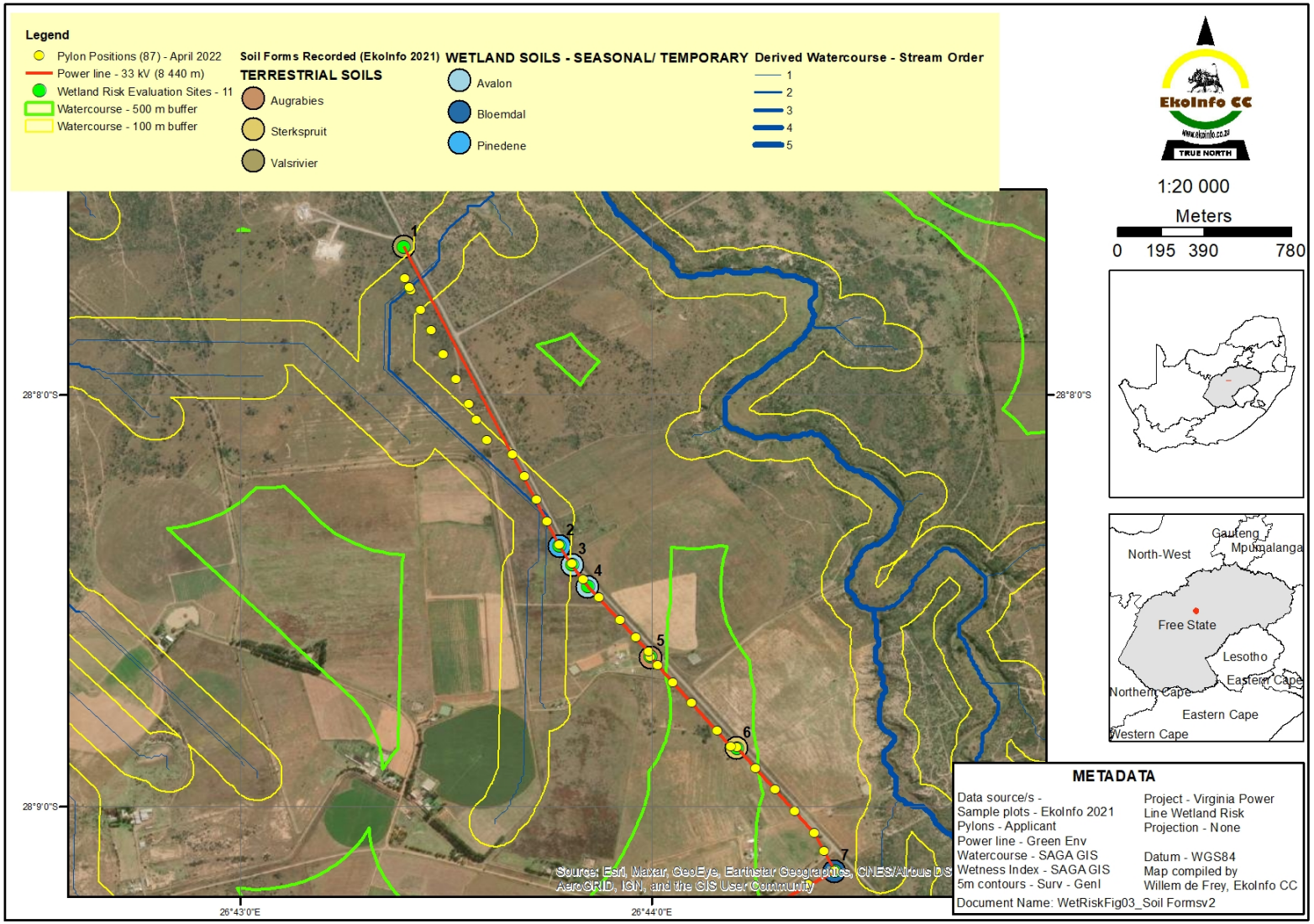


Figure 3: Recorded soil forms per observation site – northern section

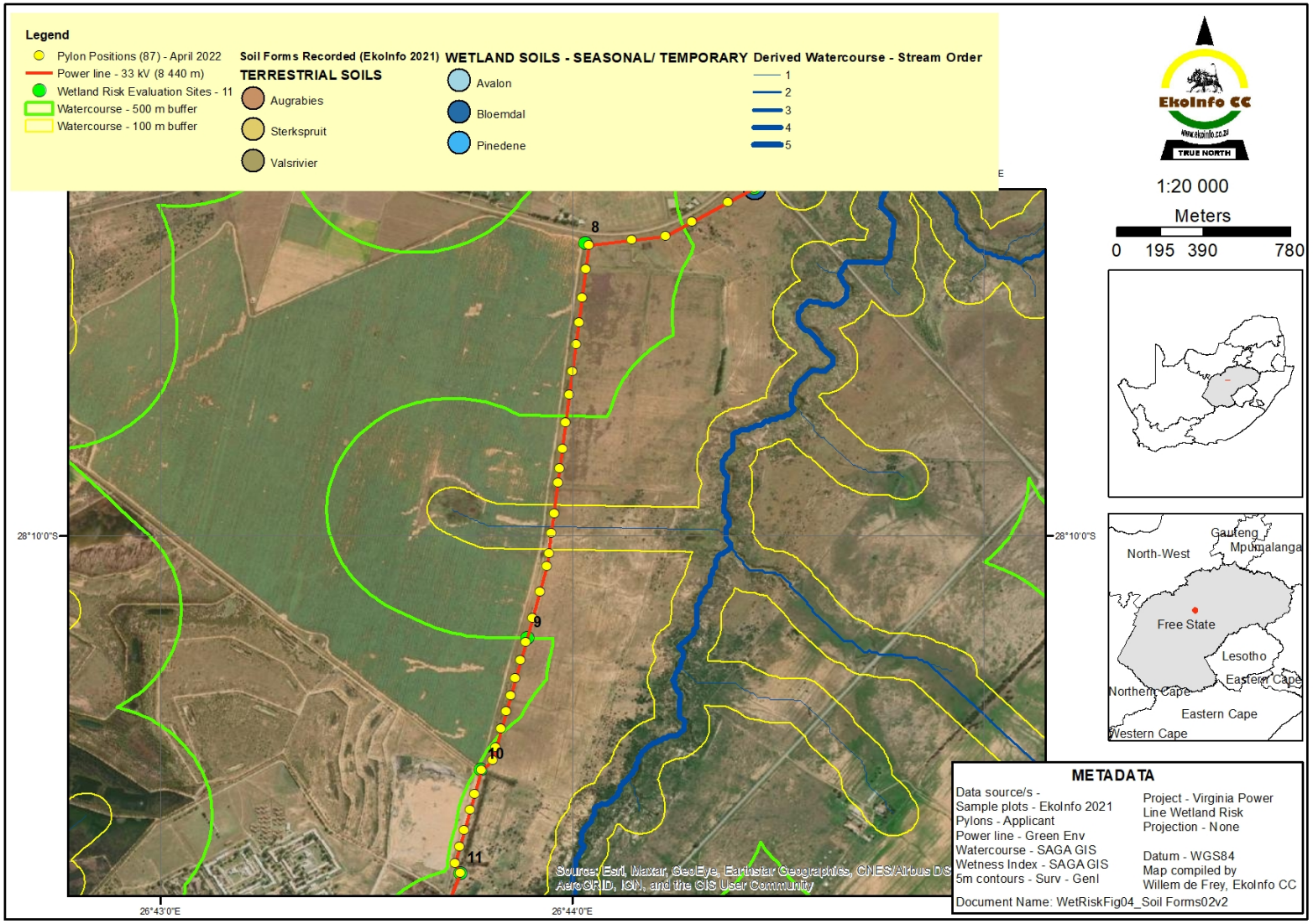


Figure 4: Recorded soil forms per observation site – southern section

Source: EkoInfo CC – April 2022

Photo 1: An example of the 33 kV towers/ pylons to be erected

Photo 2: Provincial road infrastructure along the northern section of the proposed power line (Oblique video – EkoInfo CC July 2020)

Photo 3: Farm roads and provincial road infrastructure along the central section of the proposed power line (Oblique image – EkoInfo CC July 2020)

Photo 4: Farm roads along the cultivated fields in the southern section (Oblique image – EkoInfo CC July 2020)

Photo 5: Farm and mining roads towards the southern section (Oblique image – EkoInfo CC July 2020)

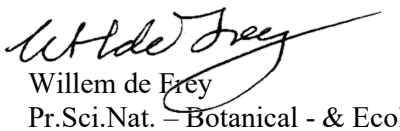
additional impacts to the landscape or temporary wetland areas. The footprint of the towers/ pylons is small (Photo 1) resulting in limited removal of soil and vegetation. It should be noted that the towers/ pylons will be in already transformed and disturbed areas (Appendix A).

The revised wetland assessment indicated that thirteen pylons are located within the temporary hillslope wetland unit present in the landscape associated with the proposed power line.

Based on the information available, the risk matrix was completed (Appendix C), which indicated that risk of the proposed activities during both the construction – and the operational phase is low with regards to temporary, natural wetlands beyond 100 m of watercourses and seasonal to permanent wetlands within 500 m of the towers.

Please do not hesitate to contact me should you have additional questions or require additional information.

Regards



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Appendix A – Georeferenced digital images taken at the observation sites

Plot no	Photo no				
1	2413	3	2436	6	2459
1	2414	3	2437	7	2460
1	2415	3	2438	7	2461
1	2416	3	2439	7	2462
1	2417	3	2440	7	2463
2	2418	3	2441	7	2464
2	2419	3	2442	8	2465
2	2420	3	2443	8	2466
2	2421	4	2444	8	2467
2	2422	4	2445	8	2468
2	2423	4	2446	9	2469
2	2424	4	2447	9	2470
2	2425	4	2448	9	2471
2	2426	4	2449	9	2472
2	2427	5	2450	10	2473
2	2428	5	2451	10	2474
2	2429	5	2452	10	2475
2	2430	5	2453	10	2476
2	2431	5	2454	11	2477
2	2432	6	2455	11	2478
2	2433	6	2456	11	2479
3	2434	6	2457	11	2480


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DSC02414


DSC02415


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APPENDIX B – UPDATE WETLAND INFORMATION, 2nd SURVEY: 7th & 8th of April 2022

After the original wetland risk assessment completed in September 2021, additional information was made available regarding the presence of wetland delineation report completed for the gas pipeline in 2017[1]. This report highlights the presence of hillslope seep wetland in proximity to the pylons of the proposed 33 kV. In addition to this document and spatial data, the pylon positions were provided in March 2022. This additional information required a re-visit of the pylon locations by both specialists, Willem de Frey and Retief Grobler in April 2022. The April 2022 visit resulted in a refinement of the hillslope seep wetland along the extent of the power line (Figure 5, Figure 6).

Due to the availability of the additional information, it is now possible to indicate how many pylons are located within the temporary hillslope seep wetland unit (Figure 6). A total of thirteen (13) pylon positions are located within the wetlands, there structure numbers are: 18, 24, 25, 26, 27, 39, 40, 41, 42, 43, 44, 45 and 73. The revision of the wetland boundary implies that eight (8) pylons positions are located outside the temporary hillslope seep wetland.

Table 1 provides a list of the pylon's numbers visited during the April 2022 survey, and the soil profiles observed. It is evident from the overall red colour of these profiles that they are not saturated for long periods[2]. Figure 7 to 9 provides an overview of the slopes associated with these temporary hillslope seeps.

[1] Grobler, R. 2017 Tetra4 Cluster 1 Gas Production Project Welkom, Free State Aquatic Ecology and Wetland Assessment EIA report. Imperata Consulting CC

[2] DWAF. 2005. A practical field procedure for identification and delineation of wetlands and riparian areas. Department of Water Affairs and Forestry

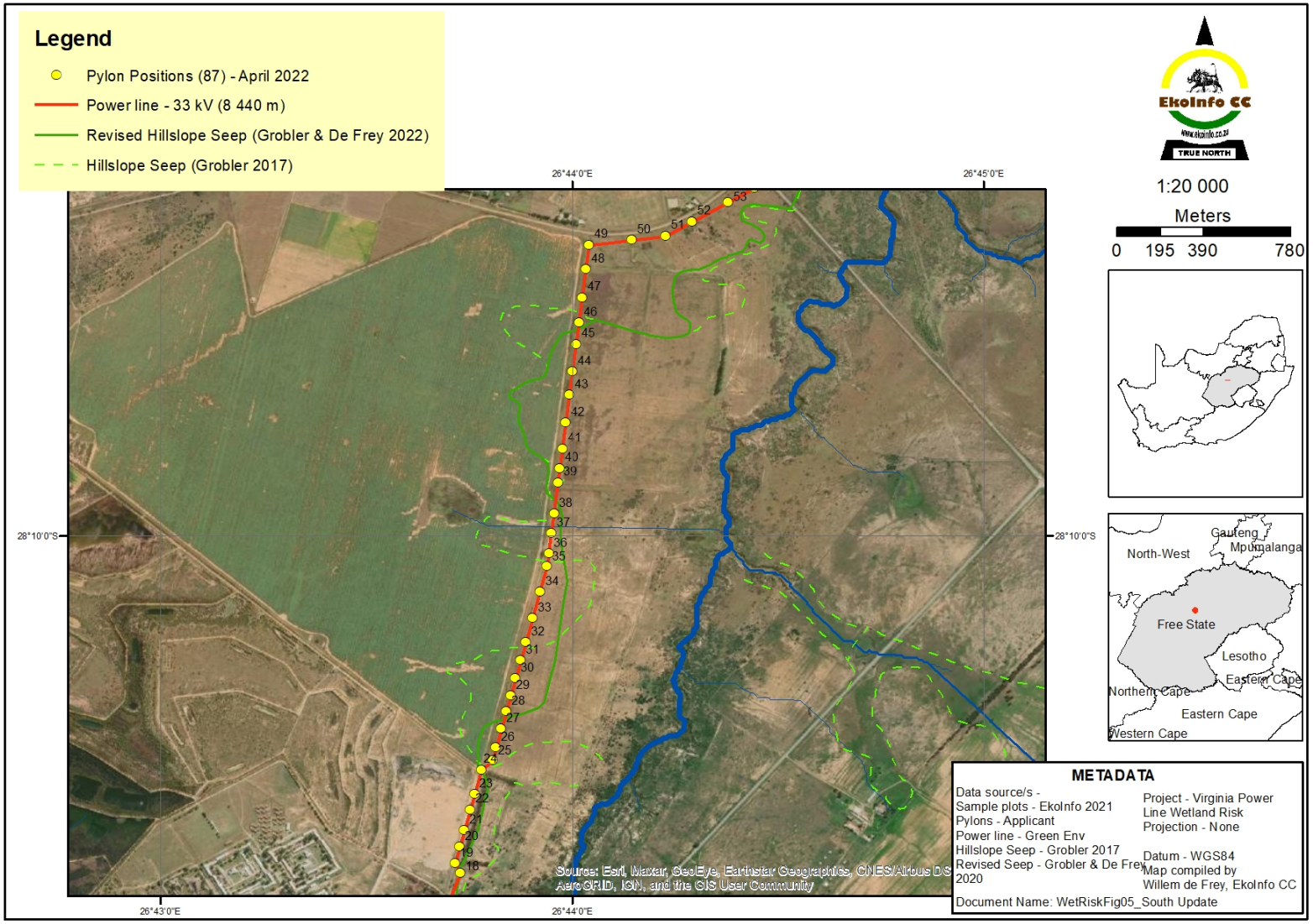

Figure 5: Extent of the hillslope seep wetland between pylon positions 18 to 53 (Southern Section)

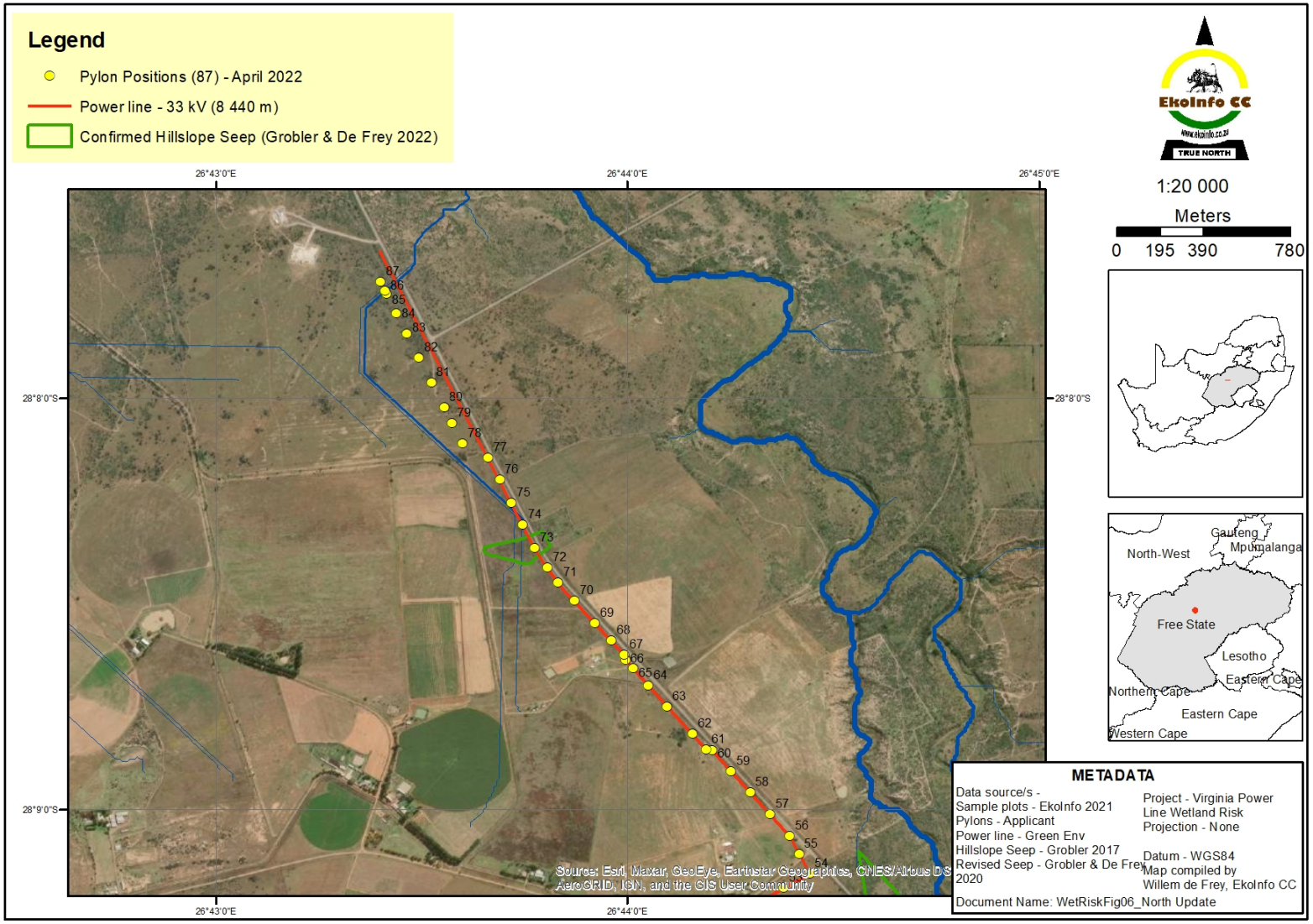

Figure 6: Extent of the hillslope seep wetland between pylon positions 54 to 87 (Southern Section)

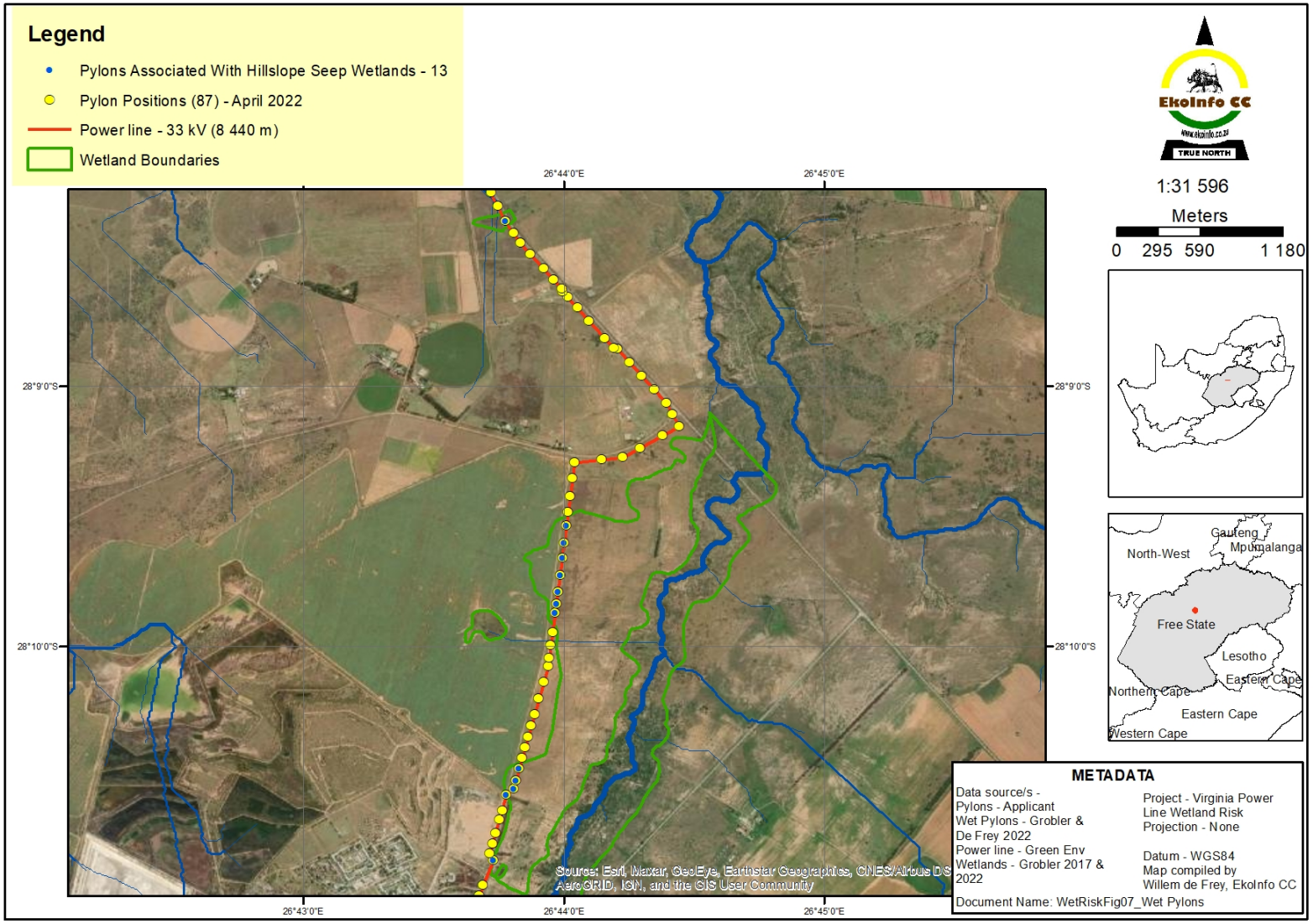

Figure 6: Distribution of the 13 pylons positions associated with temporary hillslope seep wetlands along the extent of the proposed 33 kV power line

Table 1: List of pylon positions surveyed, and georeferenced digital images taken of the soil profiles

Photo No	Pylon No
DSC03819.jpg	18
DSC03793.jpg	24
DSC03794.jpg	24
DSC03795.jpg	25
DSC03796.jpg	27
DSC03799.jpg	28
DSC03797.jpg	29
DSC03800.jpg	30
DSC03801.jpg	31
DSC03802.jpg	32
DSC03803.jpg	33
DSC03804.jpg	35
DSC03805.jpg	36
DSC03806.jpg	37
DSC03807.jpg	38
DSC03808.jpg	39
DSC03809.jpg	40
DSC03810.jpg	41
DSC03811.jpg	42
DSC03812.jpg	43
DSC03813.jpg	44
DSC03814.jpg	45
DSC03815.jpg	46
DSC03816.jpg	47
DSC03817.jpg	48
DSC03820.jpg	73
DSC03822.jpg	74
DSC03823.jpg	75
DSC03824.jpg	76

Photo plate 1: Georeferenced digital images of the soil profiles observed during the April 2022 wetland revision

Figure 7: Elevation profile between pylons 18 and 53 showing the location of the wetland on the slope

Figure 8: Elevation profile perpendicular to the power line location highlighting the slope to the east

Figure 9: Elevation profile perpendicular to the power line location highlighting the slope to the east

Appendix C – Wetland Risk Matrix: Virginia 33 kV Power line

RISK MATRIX (Based on DWS 2015 publication: Section 21 c and I water use Risk Assessment Protocol)

NAME and REGISTRATION No of SACNASP Professional member: Willem de Frey Reg no. Pr. Sci. Nat.: 400100/02

MUST BE COMPLETED BY SACNASP PROFESSIONAL MEMBER REGISTERED IN AN APPROPRIATE FIELD OF EXPERTISE.

				Severity															
Phase	**Activity**	**Aspect**	**Impact**	**Flow Regime**	**Physico & Chemical**	**Habitat**	**Biota**	**Severity**	**Spatial scale**	**Duration**	**Consequence**	**Frequency of activity**	**Frequency of impact**	**Legal Issues**	**Detection**	**Likelihood**	**Significance**	**Risk Rating**	**Confidence level**	**Control Measures**	**Borderline LOW MODERATE Rating Classes**
Construction	Delivery of tower materials and erection of towers	Vehicle movement during delivery and construction	Delivery and construction vehicles will move along existing road infrastructure. Tower materials and cables will be temporarily stored, Soil will be removed for the foundation of the towers	1	1	1	1	1	1	1	3.0	1	1	1	1	4	**12**	**L**	95	Construction should preferably occur during the dry season (winter) to limit risk of vehicles getting stuck, during mean and above mean annual rainfall events	N/A
		Temporary laydown area		1	1	1	1	1	1	1	3.0	1	1	1	1	4	**12**	**L**	95		N/A
		Excavation of tower foundations		1	1	1	1	1	1	1	3.0	1	1	1	1	4	**12**	**L**	95		N/A
Operational	Maintenance of power line	Sporadic, temporary movement of vehicles	Inspection and maintenance vehicles will travel along existing roads	1	1	1	1	1	1	1	3.0	1	1	1	1	4	**12**	**L**	95	Maintenance should be scheduled during the dry season (winter), irrespective of the annual rainfall	N/A