Lithostratigraphic column LSL-GT-05 and LSL-GT-06						Expected Depth (RTE)				Common / Expected drilling hazards		Faults	Expected drilling hazards
						LSL-GT-05		LSL-GT-06					
Era	Group	Period	Formation	Member	Lithology	mTVDSS	mMH	mTVDSS	mMH				
Cenozoic	Upper North Sea NU	Quaternary	Naaldwijk-Peize NUNA-NUPZ		Continental deposits. Fluvial sand, silt and clays	-3	0	-3	0	Mudlosses in sandy topholes, sand cavings, washouts, thin layers of swelling clays	Clayballs, overpulls, stuck pipe, swabbing		*No drilling hazards reported in well reports for PNA-GT-01 & -02 and VDB-GT-03 & -04*
			Maassluis NUMS		Very fine to coarse calcareous sand with some clay streaks.	105	108	105	108				
		Tertiary	Oosterhout NUOT		Very fine to very coarse sand. Contains shell fragments.	250	253	250	253	Thin layers of swelling clays			
			Breda NUBA		Marine glauconitic sands with silty to sandy clays.	377	380	377	380	Pyrite, swelling clays			
	Middle North Sea NM		Rupel NMRF	Rupel Clay NMRFC	Heavy dark brown marine clays. Rich in pyrite, hardly any glauconite.	412	415	412	415	Coarse chert, trace pyrite			
	Lower North Sea NL		Landen NLLF	Landen Clay NLLFC	Dark green clay. The base can be marly and of a lighter colour.	427	430	427	430	Trace pyrite, swelling clays, tight spots, bitballing (clay+marl), stuck pipe			
	Chalk CK		Ekofisk CKEK		White, chalky limestones containing rare white and grey nodular and bedded chert layers, grey to green clay laminae.	**450**	**453**	**451**	**459**	Layers of chert in complete section but mainly in top and bottom sections. Mudlosses in possible karsification zones. Tight spots while POOH	Clayballs, overpulls, stuck pipe, swabbing		**600-1100 - tight spots in LSL-GT-01 and -02 (possibly due to swelling clays)*
		Cretaceous	Ommelanden CKGR		Succession of white-yellowish-grey, fine grained limestones. Layers of chert nodules can be common over thick intervals.	467	470	463	464				
			Texel CKTX	Plenus Marl CKTXP	Dark-grey, partly black, calcareous, laminated claystone.	737	740	774	804	Swelling clay			
				Texel Marlstone CKTXM	White to light-grey, locally pinkish, limestones and marly chalks.	742	745	780	811	Trace pyrite, chert			
Mesozoic	Rijnland KN		Holland KNGL	Upper Holland Marl KNGLU	Light-grey and red-brown marls, characterised by a carbonate content which gradually increases towards the top.	767	770	808	851	Bitballing (marl + clay)	Cavings, overpulls, swabbing	Nearby fault *	**945m (MD) mud losses reported in well PNA-GT-03-S2*
				Middle Holland Claystone KNGLM	Grey and/or red-brown calcareous shaly claystone with a distinctly lower lime content than the under- and overlying members.	972	978	1005	1258	Cavings of low permeable shale fragments			**600-1100 - tight spots in LSL-GT-01 and -02 (possibly due to swelling clays)*
				Holland Greensand KNGLG	Alternation of greenish grey, very glauconitic, very fine- to fine-grained, argillaceous sandstones.	1044	1056	1074	1436				
				Lower Holland Marl KNGLL	Grey and red-brown marl or calcareous, fissile claystone, frequently with intercalated bituminous claystone beds.	**1220**	**1422**	**1189**	**1661**				
			Vlieland KNNS KNNC	De Lier KNNSL	Alternation of thin-bedded, very fine- to fine-grained argillaceous sandstones.	1318	1382	1277	1904	Pyrite, cavings from Holland Fm, swabbing, overpulls, stuck pipe			**1400 - tight spots in LSL-GT-02*
				Vlieland Claystone KNNC	Dark brownish-grey to grey claystone. Mica and very fine lignitic matter are common. Generally, the claystones are only very slightly calcareous.	1367	1450	1321	1988	Clayballs, overpulls, swabbing, shale cavings, (LIR-GT-02, PLD-GT-01), stuck pipe, mudlosses (HON-GT-01)			
				Berkel Sandstone KNNS (Target Reservoir)	Light-grey, very fine- to fine- and medium- to coarse-grained sandstone. Locally gravelly, lignitic, locally glauconitic or with sideritic concretions.	**1564**	**1957**	**1498**	**2279**		Mudlosses (PLD-GT-02), influx of formation water		
				Berkel Sand/Claystone KNNSC	Alternation of fine-grained, argillaceous sandstones and brown-grey silty to sandy claystones.	**1605**	**2021**	**1534**	**2350**	Slightly swelling clays, swabbing, overpulls			
				Rijswijk KNNSR	Light- to medium-grey sandstones with a very fine to medium and locally gravelly grain size.	1644	1966	1563	2468				
	Schieland SL		Nieuwerkerk SLDN	Rodenrijs Claystone SLDNR	Medium- to dark-grey, silty to sandy lignitic claystones with common laminated or contorted bedding, and lignite/coal beds.	1657	1980	1573	2482	Mudlosses and/or influx of formation water in 2nd part of the member, balooning, pyrite, cavings			*No drilling hazards reported in well reports for PNA-GT-01 & -02 and VDB-GT-03 & -04*
				Delft Sandstone SLDND (Target Reservoir)	Light-grey massive sandstone sequence, fine to coarse-gravelly, fining upward, lignitic.	**1822**	**2359**	**1692**	**2668**	Mudlosses and/or influx of formation water, balooning			
				Upper Alblasserdam SLDNA (Target Reservoir)	Transition of dark to light grey, red clay- and brownish siltstones - Fine to medium grained sandstones up to a few metres - Massive, thick-bedded, coarse grained sandstones.	**1868**	**2431**	**1724**	**2732**				
				Lower Alblasserdam SLDNA	Succession of dark to light grey, red clay- and siltstones - Fine to medium grained sandstones up to a few metres - Massive, thick-bedded, coarse grained sandstones.	1933	2532	1786	2818	Mudlosses (HON-GT-02), swelling and sticky clays/shales, pyrite, some cavings			
				TD		**2379**	**3225**	**2171**	**3625**				
	Altena AT	Jurassic	Werkendam ATWD		Sequence of grey, slightly marly, shaly claystones.	N/A	N/A	N/A	N/A	shale problems: sloughing clays, cavings, overpulls, stuck pipe			

* Well LSL-GT-05 drills close to a fault and may encounter affected rock

Figure 3-1 Lithostratigraphic column according to Van Adrichem Boogaert & Kouwe (1993 – 1997) adapted from [1]. The Target Reservoir Sections are indicated in Orange. Drilling hazards adapted from the Drilling Program for well LSL-GT-02 [1] and added to by PanTerra and VEM.