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Northern Gateway Development Vehicle LLP

Agricultural Land Classification and Soil Resources

at

Northern Gateway, JPA1.1

**Beechwood Court,
Long Toll, Woodcote,
RG8 0RR**

**01491 684 233
www.reading-ag.com**

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1 Introduction

- 1.1 Reading Agricultural Consultants Ltd (RAC) is instructed by Northern Gateway Development Vehicle LLP to investigate the Agricultural Land Classification (ALC) and soil resources within the Northern Gateway JPA1.1 Assessment and Application Boundaries, by means of a semi-detailed survey of soil and site characteristics.
- 1.2 Guidance for assessing the quality of agricultural land in England and Wales is set out in the Ministry of Agriculture, Fisheries and Food (MAFF) revised guidelines and criteria for grading the quality of agricultural land¹, and summarised in Natural England's Technical Information Note (TIN) 049².
- 1.3 Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. The principal physical factors influencing grading are climate, site and soil which, together with interactions between them, form the basis for classifying land into one of the five grades.
- 1.4 Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use. Grade 2 is very good quality agricultural land, with minor limitations which affect crop yield, cultivations or harvesting. Grade 3 land has moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield, and is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grade 4 land is poor quality agricultural land with severe limitations which significantly restrict the range of crops and/or level of yields. Grade 5 is very poor quality land, with very severe limitations which restrict use to permanent pasture or rough grazing.
- 1.5 Land which is classified as Grades 1, 2 and 3a in the ALC system is defined as best and most versatile (BMV) agricultural land.
- 1.6 As explained in Natural England's TIN049, the whole of England and Wales was mapped from reconnaissance field surveys in the late 1960s and early 1970s, to provide general strategic guidance on agricultural land quality for planners. This Provisional Series of maps was published

¹ **MAFF (1988).** *Agricultural Land Classification of England and Wales. Revised guidelines and criteria for grading the quality of agricultural land.* MAFF Publications.

² **Natural England (2012).** *Technical Information Note 049 - Agricultural Land Classification: protecting the best and most versatile agricultural land,* Second Edition.

on an Ordnance Survey base at a scale of One Inch to One Mile (1:63,360). The Provisional ALC map shows the site as Grade 3. However, TIN049 explains that:

"These maps are not sufficiently accurate for use in assessment of individual fields or development sites, and should not be used other than as general guidance. They show only five grades: their preparation preceded the subdivision of Grade 3 and the refinement of criteria, which occurred after 1976. They have not been updated and are out of print. A 1:250 000 scale map series based on the same information is available. These are more appropriate for the strategic use originally intended ..."

- 1.7 TIN049 goes on to explain that a definitive ALC grading should be obtained by undertaking a site survey according to the published guidelines, ordinarily at an observation density of one boring per hectare. The present survey, undertaken across the north of the Assessment Boundary, north of Whittle Brook, follows the detailed methodology set out in the MAFF guidelines, however due to the area was undertaken at a reconnaissance scale of approximately one observation per four hectares. The likely ALC of land south and west of Whittle Brook has been predicted in light of the existing survey data as well as drawing upon a number of published data sources.

2 Site and climatic conditions

General features, land form and drainage

- 2.1 The Northern Gateway JPA1.1 Assessment and Application Boundaries are broadly located between Heywood Distribution Park to the north, the M62 carriageway to the south, the M62 carriageway to the west, and Brightley Brook and Pilsworth Road to the north. The boundaries are shown on Figure RAC/10426/1.
- 2.2 The Assessment Boundary extends to 570.0ha in total of which a majority is agricultural land, primarily under permanent grassland. Non-agricultural land includes Pike Fold Golf Club in the south west, Birch Industrial Park, the Moto Birch Eastbound and Westbound service areas and a number of residential properties, farm yards and wooded areas.
- 2.3 The Application Boundary extends to 209.8ha of mostly agricultural land, primarily under permanent grassland and around 9.5ha in arable use. Non-agricultural land includes wooded areas, ponds, scrub and agricultural/commercial yards.
- 2.4 The topography across the Assessment Boundary is variable. The highest altitude is around Whittle Fold at around 130m above Ordnance Datum. The central portion of the Assessment

Boundary has irregular slopes including some of moderate steepness which fall to the south-west to around 90m AOD at Whittle Brook and to the north to around 120m AOD. The north-east of the Assessment Boundary is largely level at 120m AOD. To the south of Whittle Brook, the topography is gently sloping across the golf course between around 90m and 100m AOD.

- 2.5 Drainage of the land within the Assessment Boundary is via the slopes as well as Whittle Brook, Castle Brook, Hollins Brook and Brightley Brook, and numerous ponds in the south.

Agro-climatic conditions

- 2.6 Agro-climatic data have been interpolated from the Meteorological Office's standard 5km grid point data set at a representative altitude of 115m AOD, and are given in Table 1. The climate is cool and very wet. Moisture deficits are moderately small to moderate. The number of Field Capacity Days is larger than is average for lowland England (150) and is very unfavourable for providing opportunities for agricultural field work. The climatic criteria result in an overarching climatic limitation to agricultural land quality to Subgrade 3a.

Table 1: Local agro-climatic conditions

Parameter	Value
Grid Reference	SD 83700 08200
Average Annual Rainfall	1,088mm
Accumulated Temperatures >0°C	1,309 day°
Field Capacity Days	248 days
Average Moisture Deficit, wheat	60mm
Average Moisture Deficit, potatoes	40mm

Soil parent material and soil type

- 2.7 The underlying geology mapped by the British Geological Survey³ comprises interbedded mudstone, siltstone and pale grey sandstone belonging to the Pennine Lower Coal Measures Formation across most of the Assessment Boundary, and the Pennine Middle Coal Measures Formation in the south. In the very north of the site is Rough Rock of the Rossendale Formation, comprising coarse-grained sandstone.
- 2.8 Superficial deposits of till cover most of the Assessment Boundary and include unsorted material of a range of particle sizes from clay to boulders. There are pockets of sand and gravel of lacustrine and glaciofluvial origin mapped throughout, head deposits mapped in conjunction with Whittle Brook, and an area of peat mapped in the south around Egypt Lane and Simon Lane

³ **British Geological Survey (2025).** *BGS Geology Viewer*, <https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/>

- 2.9 The Soil Survey of England and Wales soil association mapping⁴ (1:250,000 scale) shows the Brickfield 3 association across most of the Assessment Boundary which is characterised by fine loamy, fine loamy over clayey and clayey soils. The profiles are usually seasonally waterlogged (Wetness Class (WC) IV).
- 2.10 In the north and east is the Blackwood association, characterised by coarse loamy and sandy textures. The soils are naturally affected by fluctuating groundwater but can vary from well drained WC I where the regional water table has been lowered, to WC IV where it has not.
- 2.11 In the south and east, the Newport 1 association is mapped and includes deep, well drained sandy and coarse loamy soils I⁵.

3 Agricultural land quality

Soil survey methods

- 3.1 A total of 61 soil profiles were examined across the north of the Assessment Boundary using an Edelman (Dutch) auger at an observation density of approximately one per four hectares of agricultural land. One soil pit was also excavated to examine subsoil structures and stone content. The locations of observations are indicated on Figure RAC/10426/1b. At each observation point the following characteristics were assessed for each soil horizon up to a maximum of 120cm or any impenetrable layer:
- soil texture;
 - stone content;
 - colour (including localised mottling);
 - consistency;
 - structural condition;
 - free carbonate; and
 - depth.

⁴ **Soil Survey of England and Wales (1984).** *Soils of Northern England* (1:250,000), Sheet 1

⁵ **Jarvis et al (1984).** *Soils and Their Use in Northern England*. Soil Survey of England and Wales Bulletin 10, Harpenden.

- 3.2 Two topsoil samples were submitted for laboratory determination of particle size distribution, pH, organic matter content and nutrient contents (P, K, Mg). Results are presented in Appendix 1.
- 3.3 Soil Wetness Class (WC) was determined from the matrix colour, presence or absence of, and depth to, greyish and ochreous gley mottling, and slowly permeable subsoil layers at least 15cm thick, in relation to the number of Field Capacity Days at the location.
- 3.4 Soil droughtiness was investigated by the calculation of moisture balance equations (given in Appendix 2). Crop-adjusted Available Profile Water (AP) is estimated from texture, stoniness and depth, and then compared to a calculated moisture deficit (MD) for the standard crops wheat and potatoes. The MD is a function of potential evapotranspiration and rainfall. Grading of the land can be affected if the AP is insufficient to balance the MD and droughtiness occurs.

Agricultural land classification and site limitations

Survey Data

- 3.5 Assessment of agricultural land quality has been carried out according to the revised ALC guidelines¹. Soil profiles have been described according to Hodgson⁶ which is the recognised source for describing soil profiles and characteristics according to the revised ALC guidelines. Photographs taken within the Assessment Boundary are given in Appendix 3.
- 3.6 Agricultural land quality across the surveyed portion of the Assessment Boundary is limited variably by soil wetness to Grades 3a, 3b, and 4. There are two main soil types. One soil type is broadly central, mainly west of the Birch Industrial Estate, and the second type is present either side of the first.
- 3.7 The central soil type topsoil is mainly medium clay loam or sandy clay loam of 30cm average depth, with instances of sandy loam. The colour is very dark grey, very dark greyish brown or dark greyish brown (10YR3/1, 10YR3/2 or 10YR4/2 in the Munsell soil colour charts⁷). The topsoil is non-calcareous, stoneless and contains many roots, pores and worms, indicating ample aeration and drainage. The consistency is friable and the structure is moderately well developed, with medium subangular blocky peds. The topsoil is commonly distinctly mottled; the concentration of mottles ranges from few to many.

⁶ Hodgson, J. M. (Ed.) (1997). *Soil survey field handbook*. Soil Survey Technical Monograph No. 5, Silsoe.

⁷ Munsell Color (2009). *Munsell Soil Color Book*. Grand Rapids, MI, USA

- 3.8 The upper subsoil textures include sandy clay loam, sandy loam and loamy sand, and in one localised area (Observations 14, 15 and 23), medium sand. Most of the upper subsoils are greyish brown or brown (10YR5/2 or 10YR5/3) and although inherently friable and permeable, are usually distinctly mottled and gleyed which indicates periodic waterlogging.
- 3.9 The profiles tend to become sandier with depth with most lower subsoils comprising loamy sand or sand. The colours are similar to the upper subsoils, or light yellowish brown (10YR6/4) and continue to be gleyed. Profiles that are gleyed within 40cm of the surface are in WC II and limited by wetness to Subgrade 3b. Profiles with gleying deeper than 40cm, or no gleying, are in WC I and are limited by wetness, and equally by climate, to Subgrade 3a.
- 3.10 Within the second soil type, the topsoil characteristics are similar or otherwise include heavy clay loam textures. The average topsoil depth is 33cm. The upper subsoil is mainly brown (10YR5/3) or grey (10YR5/1) heavy clay loam or clay with some sandier textures particularly in the north-east of the site. There are instances of brown and dark greyish brown upper subsoils (7.4YR4/3, 10YR4/3 and 10YR3/2). There is distinct or prominent mottling. This passes to similar lower subsoils which are gleyed and primarily slowly permeable although there are some profiles that have no slowly permeable layer, mostly occurring in the north of the site.
- 3.11 Profiles that are gleyed but permeable are in WC III. The profiles with a slowly permeable layer are in WC IV. With medium clay loam or sandy clay loam topsoil textures there is a wetness limitation to Subgrade 3b for both WCs, and with heavy clay loam topsoil there is a wetness limitation to Grade 4. There is one profile in the south (at Observation 4) that is in WC IV with an isolated incidence of clay topsoil which is Grade 5, however this has been mapped with the surrounding Subgrade 3b.

Published Data

- 3.12 Most of the unsurveyed area in the south of the Assessment Boundary is mapped as having soils of the Brickfield 3 association which corresponds with the second soil type identified in the surveys undertaken. The profiles are limited by wetness to Subgrade 3b or Grade 4.
- 3.13 The sandy Newport 1 association which corresponds with the first soil type identified in the surveys is mapped in the very south, across the golf course. The land is non-agricultural, however there may be a transitional area between the two soil types, also most likely to be in Subgrade 3b.

- 3.14 Land in the north/east of the Assessment Boundary includes all three mapped soil types of the Brickfield 3, Newport 1 and Blackwood associations. The area was surveyed by RAC in 2017 and classified as a majority Grade 4 with smaller areas of Subgrades 3a and 3b.
- 3.15 The combined confirmed and predicted ALC distribution within the Assessment and Application Boundaries are shown in Figure RAC/10426/2 and the areas of each grade for the Assessment Boundary are given in Table 2 and for the Application Boundary in Table 3.

Table 2: ALC areas: Assessment Boundary

Grade	Description	Area (ha)	%
Subgrade 3a	Good quality	21.8	4
Subgrade 3b	Moderate quality	259.0	45
Grade 4	Poor quality	43.1	8
Grade 5	Very poor quality	1.8	-
Non-agricultural		244.3	43
Total		570.0	100

Table 3: ALC areas: Application Boundary

Grade	Description	Area (ha)	%
Subgrade 3a	Good quality	17.7	8
Subgrade 3b	Moderate quality	133.2	64
Grade 4	Poor quality	25.4	12
Grade 5	Very poor quality	1.8	1
Non-agricultural		31.8	15
Total		209.9	100

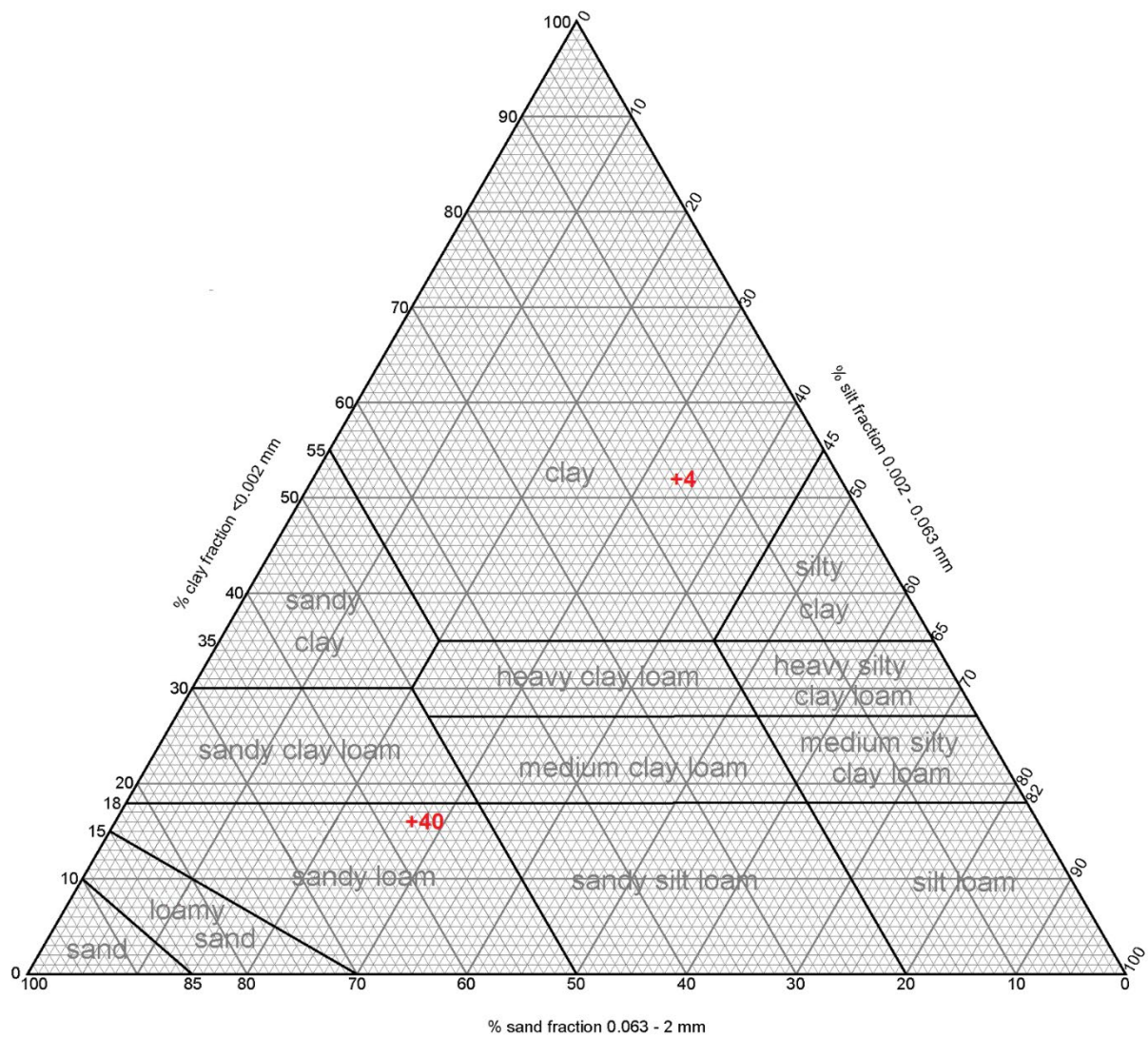
Appendix 1: Laboratory Data

Determinand	Site 4	Site 40	Units
Sand 2.00-0.063 mm	15	57	% w/w
Silt 0.063-0.002 mm	33	27	% w/w
Clay <0.002 mm	52	16	% w/w
Organic Matter	3.0	6.4	% w/w
Texture	Clay	Sandy Loam	

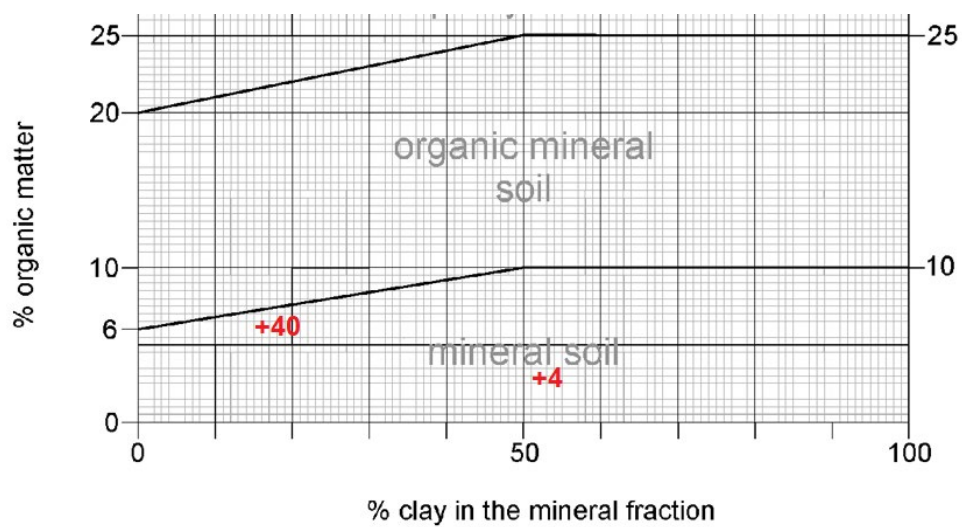
Determinand	Site 4	Site 40	Units
Soil pH	5.6	6.3	
Phosphorus (P)	5.6	14.2	mg/l (av)
Potassium (K)	147	23.4	mg/l (av)
Magnesium (Mg)	229	63.6	mg/l (av)

Determinand	Site 4	Site 40	Units
Phosphorus (P)	1	0	ADAS Index
Potassium (K)	0	2-	ADAS Index
Magnesium (Mg)	2	4	ADAS Index

Soil Texture by Particle Size Analysis



Organic Matter Class



Appendix 2: Soil Profile Summaries and Droughtiness Calculations

Wetness / workability limitations are determined according to the methodology given in Appendix 3 of the ALC guidelines, MAFF 1988

Droughtiness calculations are made according to the methodology given in Appendix 4 of the ALC guidelines, MAFF 1988.

Grades are shown for drought, wetness and any other soil or site factors which are relevant. The overall Grade is set by the most limiting factor and shown on the right.

Stone types		
%	TAv	Eav
hard	1	0.5
chalk	10	7

hard flint & pebble

Climate Data	
MDwheat	60
MDpotato	40
FCD	248

Wetness Class Guidelines		<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>
SPL within 80cm, gleying within 40cm			>68cm	28-68cm	<28cm
SPL within 80cm, gleying at 40-70cm			All		
No SPL but gleying within 40cm		coarse subsoil	<i>II</i>	other cases	<i>III</i>

Maximum depth of auger penetration is underlined

Site No.		Depth cm		Texture	CaCO ₃	Colour	Mottle colour	abundance	stone% hard	stone% chalk	Structure	APwheat mm	AP potato mm	Gley	SPL	WC	Wetness grade WE	Final Grade	Limiting Factor(s)
1	T	0	30	SCL		10YR4/2						51	51	n	n	<i>II</i>	3b	3b	WE
		30	50	SCL		10YR5/3						30	30	n	n				
		50	120	SCL		10YR5/3	och	mmd				70	30	y	n				
											Total	151	111						
											MD	91	71						
Droughtiness grade (DR)												1	1						
2	T	0	30	mCL		10YR3/2						54	54	n	n	<i>IV</i>	3b	3b	WE
		30	60	hCL		10YR4/3	och	mmd				42	48	(y)	n				
		60	120	C		10YR5/3	och	mmd			poor	42	13	y	y				
											Total	138	115						
											MD	78	75						
Droughtiness grade (DR)												1	1						
3	T	0	30	mCL		10YR4/2	och	mmd			-	54	54	y	n	<i>III</i>	3b	3b	WE
		30	40	hCL		7.5YR4/3	och	cmd				16	16	n	n				
		40	120	C		7.5YR4/3	och	cmd				72	48	n	n				
											Total	142	118						
											MD	82	78						
Droughtiness grade (DR)												1	1						
4	T	0	40	C		10YR4/1	och	cmd			-	68	68	y	n	<i>IV</i>	5	5	WE

		40	60	C	10YR4/3	och	cmd	poor	20	26	n	y					
		60	120	C	10YR5/3	och	cmd	poor	42	13	y	y					
								Total	130	107							
								MD	70	67							
								Droughtiness grade (DR)	1	1							
5	T	0	30	mCL	10YR3/2	och	mmd	-	54	54	(y)	n	//	3b	3b		WE
		30	50	LmS	10YR5/2	och	mmd		18	18	y	n					
		50	120	mS	10YR5/3	och	mmd		35	14	y	n					
								Total	107	86							
								MD	47	46							
								Droughtiness grade (DR)	1	1							
6	T	0	30	SCL	10YR3/2	och	mmd	-	51	51	(y)	n	//	3b	3b		WE
		30	40	SL	10YR6/3	och	mmd		15	15	y	n					
		40	120	SL	10YR6/3	och	mmd		92	45	y	n					
								Total	158	111							
								MD	98	71							
								Droughtiness grade (DR)	1	1							
7	T	0	30	mCL	10YR3/2	och	cmd	-	54	54	n	n	IV	3b	3b		WE
		30	60	hCL	10YR5/1	och	mmd		42	48	y	n					
		60	120	C	10YR5/3	och	cmd	poor	42	13	y	y					
								Total	138	115							
								MD	78	75							
								Droughtiness grade (DR)	1	1							
8	T	0	30	mCL	10YR3/2	och	fff	-	54	54	n	n	IV	3b	3b		WE
		30	120	C	10YR6/3	och	cmd	poor	75	52	y	y					
								Total	129	106							
								MD	69	66							
								Droughtiness grade (DR)	1	1							
9	T	0	30	mCL	10YR3/2	och	cmd	-	54	54	n	n	IV	3b	3b		WE
		30	120	C	7.5YR5/3	och	cmd	poor	75	52	y	y					
								Total	129	106							

								MD	69	66						
								Droughtiness grade (DR)	1	1						
10	T	0	20	SCL	10YR3/2	och	mmd	-	34	34	(y)	n	//	3b	3b	WE
		20	50	LmS	10YR5/2	och	mmd		27	27	y	n				
		50	120	mS	10YR5/3	och	mmd		35	14	y	n				
	Total								96	75						
								MD	36	35						
								Droughtiness grade (DR)	1	1						
11	T	0	30	SCL	10YR4/2	och	cmd	-	51	51	y	n	IV	3b	3b	WE
		30	50	C	10YR5/3	och	cmd	poor	26	26	y	y				
		50	120	SL	10YR5/1	och	cmd		77	30	y	n				
	Total								154	107						
								MD	94	67						
								Droughtiness grade (DR)	1	1						
12	T	0	30	mCL	10YR3/2	och	fmd	-	54	54	n	n	IV	3b	3b	WE
		30	45	SL	10YR5/1	och	mmd		23	23	y	n				
		45	120	C	10YR5/3	och	mmd	poor	56	33	y	y				
	Total								132	109						
								MD	72	69						
								Droughtiness grade (DR)	1	1						
13	T	0	30	mCL	10YR3/2	och	fmd	-	54	54	n	n	IV	3b	3b	WE
		30	50	C	10YR5/3	och	cmp	poor	26	26	y	y				
		50	120	C	10YR5/2	och	mmd	poor	49	26	y	y				
	Total								129	106						
								MD	69	66						
								Droughtiness grade (DR)	1	1						
14	T	0	30	mCL	10YR3/1			-	54	54	n	n	//	3b	3b	WE
		30	120	mS	10YR5/3	och	mmd		49	28	y	n				
	Total								103	82						
								MD	43	42						
								Droughtiness grade (DR)	1	1						
15	T	0	30	SCL	10YR4/2	och	mmd	-	51	51	y	n	//	3b	3b	WE

		30	120	mS		10YR5/3	och	cmd		49	28	y	n				
									Total	100	79						
									MD	40	39						
									Droughtiness grade (DR)	1	1						
16	T	0	30	hCL		10YR4/2	och	mmd	-	54	54	y	n	IV	4	4	WE
		30	40	hCL		10YR5/3	och	mmd		16	16	y	n				
		40	120	C		10YR6/3	och	mmd	poor	62	39	y	y				
									Total	132	109						
									MD	72	69						
17				Non Ag													
18	T	0	35	hCL		10YR4/2	och	cmd	-	63	63	y	n	IV	4	4	WE
		35	120	C		10YR5/3	och	cmd	poor	69	46	y	y				
									Total	132	109						
									MD	72	69						
									Droughtiness grade (DR)	1	1						
19	T	0	35	hCL		10YR4/2	och	cmd	-	63	63	y	n	IV	4	4	WE
		35	120	C		10YR5/3	och	cmd	poor	69	46	y	y				
									Total	132	109						
									MD	72	69						
									Droughtiness grade (DR)	1	1						
20	T	0	35	hCL		10YR4/3	och	mmd	-	63	63	(y)	n	IV	4	4	WE
		35	120	C		10YR5/3	och	cmd	poor	69	46	y	y				
									Total	132	109						
									MD	72	69						
									Droughtiness grade (DR)	1	1						
21	T	0	30	mCL		10YR4/2	och	mmd	-	54	54	y	n	//	3b	3b	WE
		30	55	SL		10YR5/3	och	cmd		36	38	y	n				
		55	120	SL		10YR5/2	och	cmd		72	23	y	n				
									Total	161	114						
									MD	101	74						
									Droughtiness grade (DR)	1	1						

22	T	0	30	mCL	10YR4/2	och	fmd	-	54	54	n	n	IV	3b	3b	WE
		30	50	C	7.5YR5/3	och	cmd	poor	26	26	y	y				
		50	120	cS	7.5YR5/3	och	cmd		28	10	y	n				
					Total				108	90						
					MD				48	50						
Droughtiness grade (DR)									1	1						
23	T	0	30	SL	10YR4/2	och	mmd	-	51	51	y	n	//	3a	3a	WE OC
		30	120	mS	10YR6/4	och	cmd		49	28	y	n				
					Total				100	79						
					MD				40	39						
					Droughtiness grade (DR)				1	1						
24	T	0	30	SCL	10YR4/2	och	mmd	-	51	51	y	n	//	3b	3b	WE
		30	50	SL	10YR5/3	och	mmd		30	30	y	n				
		50	120	mS	10YR6/4	och	mmd		35	14	y	n				
					Total				116	95						
					MD				56	55						
Droughtiness grade (DR)									1	1						
25	T	0	30	SCL	10YR4/2			-	51	51	n	n	/	3a	3a	WE OC
		30	40	SL	10YR4/3	och	mmd		15	15	n	n				
		40	120	LmS	10YR6/4	och	mmd		51	27	y	n				
					Total				117	93						
					MD				57	53						
Droughtiness grade (DR)									1	1						
26	T	0	30	SCL	10YR4/3	och	fmd	-	51	51	n	n	/	3a	3a	WE OC
		30	65	SC	10YR5/3	och	fmf		45	53	n	n				
		65	120	LmS	10YR5/3	och	fmd		33	5	n	n				
					Total				129	108						
					MD				69	68						
Droughtiness grade (DR)									1	1						
27	T	0	35	hCL	10YR4/2	och	mmd	-	63	63	y	n	IV	4	4	WE
		35	120	C	10YR5/3	och	fmd	poor	69	46	n	y				

										Total	132	109						
										MD	72	69						
										Droughtiness grade (DR)	1	1						
28	T	0	40	SCL	10YR3/2	och	fmd		-	68	68	y	n	IV	3b	3b	WE	
		40	120	SCL	10YR5/3	och	mmd		poor	69	39	y	y					
											Total	137	107					
											MD	77	67					
										Droughtiness grade (DR)	1	1						
29	T	0	30	SCL	10YR4/2	och	fff		-	51	51	n	n	I	3a	3a	WE OC	
		30	50	SCL	10YR4/2	och	fmd			30	30	n	n					
		50	60	LmS	10YR5/2	och	fmd	10		5	8	n	n					
		60	120	LmS	10YR5/2	och	fmd	20		29	7	n	n					
											Total	116	97					
										MD	56	57						
										Droughtiness grade (DR)	1	1						
30	T	0	30	SCL	10YR3/2	och	fmd		-	51	51	n	n	II	3b	3b	WE	
		30	50	SL	10YR5/3	och	mmd			30	30	y	n					
		50	120	LmS	10YR5/3	och	cmd			42	18	y	n					
											Total	123	99					
										MD	63	59						
										Droughtiness grade (DR)	1	1						
31	T	0	30	SCL	10YR3/2	och	fcd		-	51	51	n	n	II	3b	3b	WE	
		50	120	SCL	10YR3/1	och	mmd			70	30	(y)	n					
											Total	121	81					
										MD	61	41						
										Droughtiness grade (DR)	1	1						
32	T	0	30	SCL	10YR3/2	och	fmd		-	51	51	n	n	III	3b	3b	WE	
		30	50	LmS	10YR5/3	och	cmd			18	18	y	n					
		50	120	LmS	10YR6/3	och	cmp			42	18	y	n					
											Total	111	87					
										MD	51	47						
										Droughtiness grade (DR)	1	1						

33	T	0	30	hCL	10YR4/2	och	mmd	-	54	54	y	n	///	4	4	WE
		30	120	SC	10YR5/3	och	cmd		100	60	y	n				
								Total	154	114						
								MD	94	74						
								Droughtiness grade (DR)	1	1						
34	T	0	30	SCL	10YR4/2	och	mmd	-	51	51	y	n	IV	3b	3b	WE
		30	120	SC	10YR5/3	och	cmd	poor	82	52	y	y				
								Total	133	103						
								MD	73	63						
								Droughtiness grade (DR)	1	1						
35	T	0	30	SCL	10YR4/2	och	fmd	-	51	51	n	n	//	3b	3b	WE
		30	120	SL	10YR4/3	och	mmd		107	60	(y)	n				
								Total	158	111						
								MD	98	71						
								Droughtiness grade (DR)	1	1						
36	T	0	30	SCL	10YR3/2	och	mmd	-	51	51	(y)	n	//	3b	3b	WE
		30	45	SCL	10YR5/3	och	cmd		23	23	y	n				
		45	50	LmS	10YR5/3	och	cmd		5	5	y	n				
		50	60	LcS	10YR6/3	och	cmd		6	8	y	n				
		60	120	LcS	10YR6/3	och	cmd		36	8	y	n				
								Total	120	94						
								MD	60	54						
								Droughtiness grade (DR)	1	1						
37	T	0	30	hCL	10YR3/2	och	mmd	-	54	54	(y)	n	IV	4	4	WE
		30	50	SL	10YR5/1	och	mmd		30	30	y	n				
		50	120	C	10YR6/3	och	cmd	poor	49	26	y	y				
								Total	133	110						
								MD	73	70						
								Droughtiness grade (DR)	1	1						
38	T	0	30	mCL	10YR4/2	och	fmd	-	54	54	n	n	//	3b	3b	WE
		30	120	SCL	10YR4/2	och	cmd		100	60	y	n				

								Total	154	114						
								MD	94	74						
Droughtiness grade (DR)								1	1							
39	T	0	35	mCL	10YR3/2	och	mmd	-	63	63	(y)	n	IV	3b	3b	WE
		35	120	C	10YR5/2	och	cmp	poor	69	46	y	y				
									Total	132	109					
									MD	72	69					
Droughtiness grade (DR)								1	1							
40/P1	T	0	35	SL	10YR3/2	och	mmd	-	60	60	(y)	n	//	3a	3a	WE OC
		35	50	SL	10YR5/1	och	cmd		23	23	y	n				
		50	120	SL	10YR5/3	och	cmp		77	30	y	n				
									Total	159	112					
								MD	99	72						
Droughtiness grade (DR)								1	1							
40	T	0	30	SCL	10YR3/2	och	fff	-	51	51	n	n	//	3b	3b	WE
		30	120	SL	10YR5/3	och	cmd		107	60	y	n				
									Total	158	111					
									MD	98	71					
Droughtiness grade (DR)								1	1							
41	Unable to complete - stream and crops blocking access to area - rough grazing slight slope															
42	T	0	30	hCL	10YR3/1	och	fmd	-	54	54	n	n	IV	4	4	WE
		30	120	C	10YR5/3	och	cmd	poor	75	52	y	y				
									Total	129	106					
									MD	69	66					
Droughtiness grade (DR)								1	1							
43	T	0	30	SCL	10YR4/2	och	fmd	-	51	51	n	n	//	3b	3b	WE
		30	40	SL	10YR5/2	och	mmd		15	15	y	n				
		40	120	LmS	10YR5/1	och	mmd		51	27	y	n				
									Total	117	93					
								MD	57	53						
Droughtiness grade (DR)								1	1							
44	T	0	30	SCL	10YR3/2	och	mmd	-	51	51	(y)	n	///	3b	3b	WE

		30	50	SCL	10YR4/2	och	mmd		30	30	y	n				
		50	120	SC	10YR5/1	och	mmd		70	30	y	n				
					Total				151	111						
					MD				91	71						
					Droughtiness grade (DR)				1	1						
45	T	0	30	SCL	10YR4/2	och	mmd	-	51	51	y		///	3b	3b	WE
		30	40	SL	10YR4/3	och	mmd		15	15	y					
		40	120	LmS	10YR6/4	och	mmd		51	27	y					
					Total				117	93						
					MD				57	53						
					Droughtiness grade (DR)				1	1						
46	T	0	40	mCL	10YR3/1	och	mmd	-	72	72	(y)	n	IV	3b	3b	WE
		40	50	C	10YR5/3	och	cmd		16	16	y	n				
		50	120	C	10YR5/3	och	cmd	poor	49	26	y	y				
					Total				137	114						
					MD				77	74						
					Droughtiness grade (DR)				1	1						
47	T	0	30	SCL	10YR3/1	och	fmd	-	51	51	n	n	I	3a	3a	WE OC
		30	70	SL	7.5YR5/3	och	fmd		52	60	n	n				
		70	120	SL	7.5YR3/3	och	mmd		55	0	y	n				
					Total				158	111						
					MD				98	71						
					Droughtiness grade (DR)				1	1						
48	T	0	45	mCL	10YR3/1	och	fmf	-	81	81	n	n	///	3b	3b	WE
		45	60	SCL	10YR5/3	och	cmd		18	23	y	n				
		60	120	C	10YR5/3	och	cmd	poor	42	13	y	y				
					Total				140	117						
					MD				80	77						
					Droughtiness grade (DR)				1	1						
49	T	0	35	mCL	10YR3/1	och	mmd	-	63	63	(y)	n	IV	3b	3b	WE
		35	120	C	10YR5/3	och	cmd	poor	69	46	y	y				

										Total	132	109						
										MD	72	69						
										Droughtiness grade (DR)	1	1						
50	T	0	30	SCL	10YR3/2	och	fmd		-	51	51	n	n	/	3a	3a	WE OC	
		30	120	SCL	10YR3/2	och	cmd			100	60	n	n					
											Total	151	111					
											MD	91	71					
											Droughtiness grade (DR)	1	1					
51	T	0	30	SCL	10YR3/2	och	mmd		-	51	51	(y)	n	IV	3b	3b	WE	
		30	120	C	10YR6/3	och	mmd		poor	75	52	y	y					
											Total	126	103					
											MD	66	63					
											Droughtiness grade (DR)	1	1					
52	T	0	35	mCL	10YR3/1	och	mmd		-	63	63	(y)	n	IV	3b	3b	WE	
		35	55	SL	10YR5/2	och	mmd			28	30	y	n					
		55	120	ZC	10YR5/2	och	mmd		poor	46	18	y	y					
											Total	136	111					
											MD	76	71					
										Droughtiness grade (DR)	1	1						
53	T	0	40	mCL	10YR3/1	och	mmd		-	72	72	(y)	n	III	3b	3b	WE	
		40	50	SCL	10YR3/2	och	mmd			15	15	(y)	n					
		50	70	LmS	10YR5/1	och	mmd			12	18	y	n					
		70	120	C	10YR5/1	och	cmd		poor	35	0	y	y					
											Total	134	105					
										MD	74	65						
										Droughtiness grade (DR)	1	1						
54	T	0	30	SCL	10YR3/2	och	fmd		-	51	51	n	n	//	3b	3b	WE	
		30	70	LmS	10YR5/2	och	mmd	10		27	33	y	n					
		70	120	LmS	10YR5/2	och	mmd	20		25	0	y	n					
											Total	103	84					
											MD	43	44					
										Droughtiness grade (DR)	1	1						

55	T	0	30	mCL	10YR3/2	och	cmd	-	54	54	n	n	IV	3b	3b	WE
		30	60	fSL	10YR5/1	och	mmd		49	54	y	n				
		60	120	C	10YR5/1	och	mmd	poor	42	13	y	y				
					Total				145	121						
					MD				85	81						
Droughtiness grade (DR)									1	1						
56	T	0	30	mCL	10YR3/2	och	fmd	-	54	54	n	n	IV	3b	3b	WE
		30	50	SCL	10YR5/3	och	mmd		30	30	y	n				
		50	120	C	7.5YR5/3	och	cmd	poor	49	26	y	y				
					Total				133	110						
					MD				73	70						
Droughtiness grade (DR)									1	1						
57	T	0	40	mCL	10YR3/1	och	mmd	-	72	72	(y)	n	III	3b	3b	WE
		40	55	SL	10YR5/3	och	mmd	20	17	18	y	n				
		55	120	SCL	10YR5/3	och	cmd		65	23	y	n				
					Total				154	113						
					MD				94	73						
Droughtiness grade (DR)									1	1						
58	T	0	35	mCL	10YR3/1	och	fmd	-	63	63	n	n	III	3b	3b	WE
		35	120	C	7.5YR4/3	och	cmd	poor	69	46	n	y				
					Total				132	109						
					MD				72	69						
					Droughtiness grade (DR)				1	1						
59	T	0	30	mCL	10YR3/1	och	fmd	-	54	54	n	n	II	3b	3b	WE
		30	120	SL	10YR5/2	och	cmd		107	60	y	n				
					Total				161	114						
					MD				101	74						
					Droughtiness grade (DR)				1	1						
60	T	0	30	SCL	10YR3/2	och	fmd	-	51	51	n	n	IV	3b	3b	WE
		30	55	SL	10YR5/3	och	cmd		36	38	y	n				
		55	120	C	10YR5/2	och	cmd	poor	46	20	y	y				

								Total	132	108							
								MD	72	68							
Droughtiness grade (DR)								1	1								
61	T	0	30	hCL	10YR3/1			-	54	54	n	n	///	4	4	WE	
		30	60	hCL	10YR3/2	och	mmd		42	48	(y)	n					
		60	120	C	10YR3/2	och	fmd		48	16	n	n					
									Total	144	118						
								MD	84	78							
Droughtiness grade (DR)								1	1								
62	T	0	45	mCL	10YR3/1	och	mmd	-	81	81	(y)	n	///	3b	3b	WE	
		45	70	C	10YR5/1	och	mmd		24	40	y	n					
		70	120	SL	10YR5/1	och	cmp		55	0	y	n					
									Total	160	121						
								MD	100	81							
Droughtiness grade (DR)								1	1								
63	T	0	20	C	10YR5/3	och	mmd	-	81	81	y	n	///	4	4	WE	
		20	70	mS	10YR5/1	och	mcp		24	40	y	n					
		70	120	C	7.5YR4/3	och	mmd	Poor	55	0	(y)	y					
									Total	160	121						
								MD	100	81							
Droughtiness grade (DR)								1	1								

Appendix 3: Photographs



Pit 1



Pit 1 topsoil



Pit 1 upper subsoil



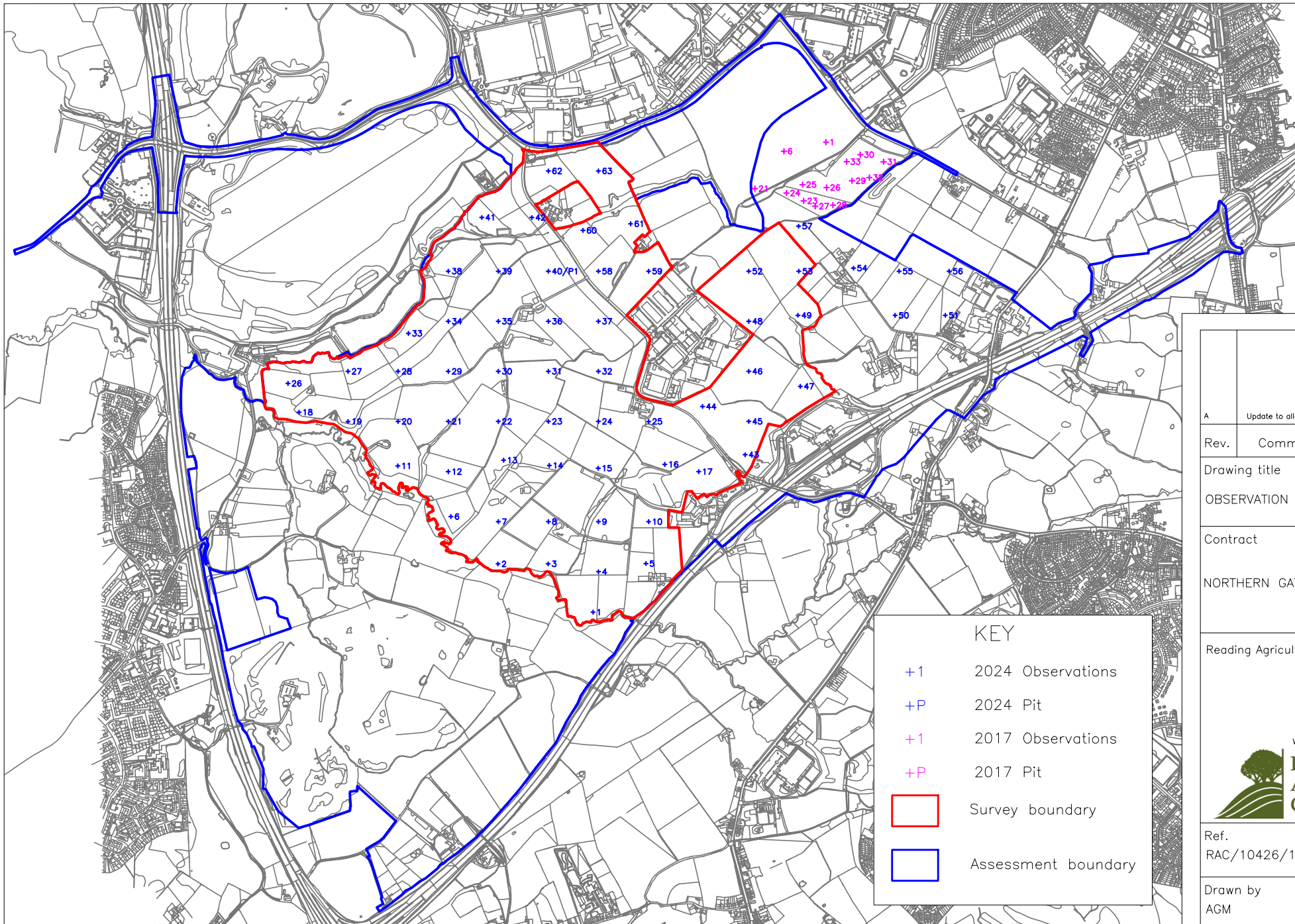
Pit 1 lower subsoil



Profile 4



Profile 25



KEY

+1

2024 Observations

+P

2024 Pit

+1

2017 Observations

+P

2017 Pit

Survey boundary

Assessment boundary

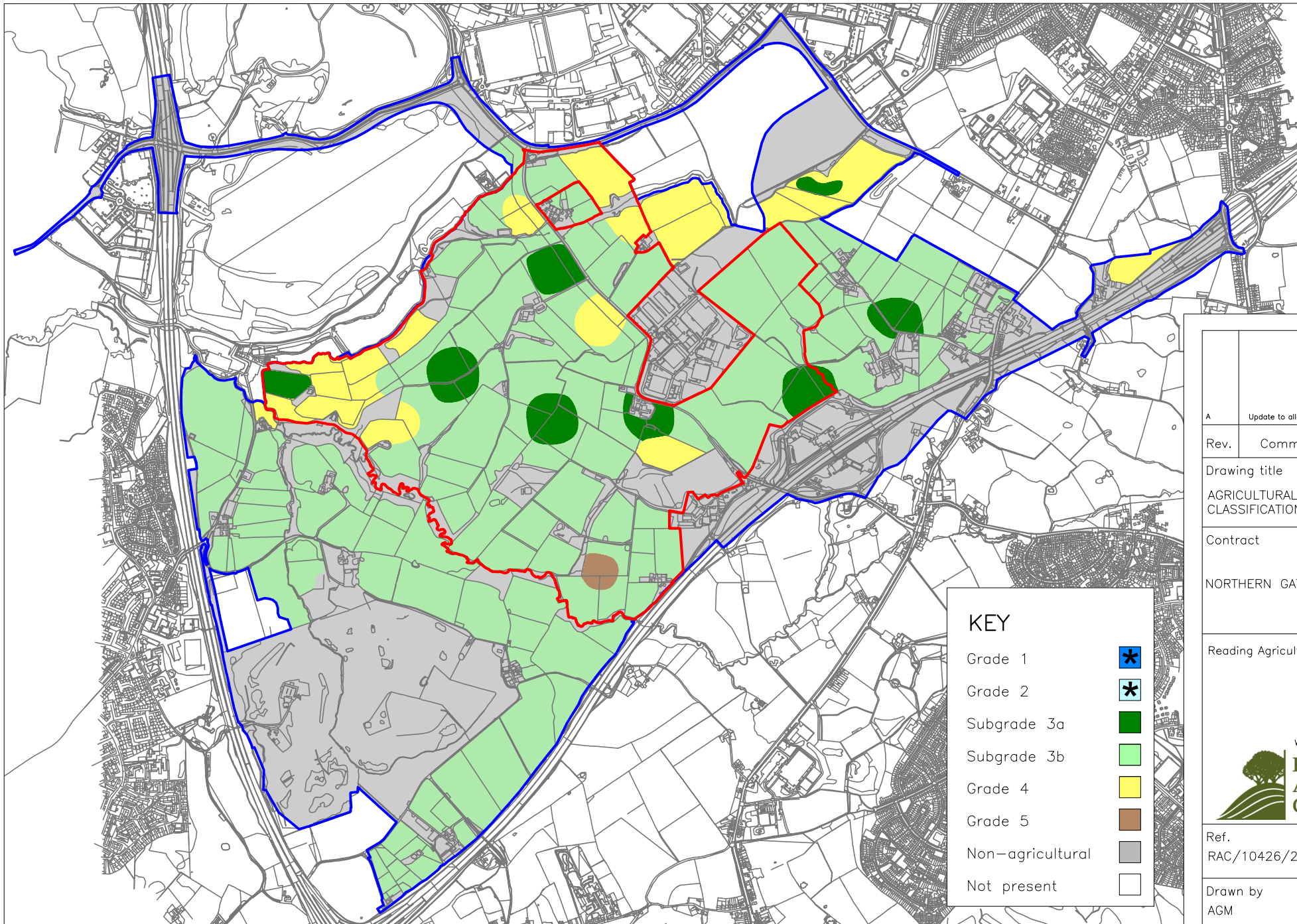
1:20,000

0

400m

800m

A	Update to allocation boundary	01/2025
Rev.	Comment	Date
Drawing title		
OBSERVATION MAPPING		
Contract		
NORTHERN GATEWAY		
Reading Agricultural Consultants Ltd Gate House Beechwood Court Long Toll Woodcote RG8 0RR 01491 684233 www.reading-ag.com		
 READING AGRICULTURAL CONSULTANTS		
Ref. RAC/10426/1	Rev. A	
Drawn by AGM	Checked by SRW	
Scales 1:20,000@A4	Date 01/2025	



KEY

- Grade 1
- Grade 2
- Subgrade 3a
- Subgrade 3b
- Grade 4
- Grade 5
- Non-agricultural
- Not present



A	Update to allocation boundary	01/2025
Rev.	Comment	Date
Drawing title AGRICULTURAL LAND CLASSIFICATION		
Contract NORTHERN GATEWAY		
Reading Agricultural Consultants Ltd Gate House Beechwood Court Long Toll Woodcote RG8 0RR 01491 684233 www.reading-ag.com		
 READING AGRICULTURAL CONSULTANTS		
Ref. RAC/10426/2	Rev. A	
Drawn by AGM	Checked by SRW	
Scales 1:20,000@A4	Date 01/2025	