

# Chamomile Management Plan



<b>Site:</b>	Land at Newgate Lane (South), Fareham
<b>Client:</b>	Bargate Homes
<b>Job Number:</b>	A117387
<b>Survey Type(s):</b>	Botanical Survey and Chamomile Management Plan
<b>Date of Survey(s):</b>	5 August 2020 and 26 October 2020
<b>File Location:</b>	I:\Projects\Projects A117000 on\A117387 Land West of Newgate Lane\Reports

## Introduction

WYG were commissioned in July 2020 to undertake a botanical survey of four fields at the Land at Newgate Lane (South), Fareham site. This was principally to establish the presence of the notable species chamomile and assess the vegetation to inform a suitable management plan for the proposed development.

Ethos Ecology (2019) undertook the first Ecological Assessment which assessed the fields as improved grassland, heavily grazed and poached by horses (their section 5.2.2). Species identified were perennial rye-grass *Lolium perenne*, daisy *Bellis perennis*, dandelion *Taraxacum officinale*, annual meadow-grass *Poa annua*, white clover *Trifolium repens*, creeping bent *Agrostis stolonifera* and creeping thistle *Cirsium arvense*. However, subsequently, chamomile *Chamaemelum nobile* was identified as present on the site. Chamomile is a declining species and is listed as 'Vulnerable' within the Vascular Plant Red Data List for Great Britain (Cheffings & Farrell, 2005). This plant is included as a species 'of principal importance for the purpose of conserving biodiversity' under Section 41 (England) of the Natural Environment and Rural Communities Act 2006.

The fields have been designated as a Site of Importance for Nature Conservation due to the presence of a large population of chamomile *Chamaemelum nobile*. The potential presence of MG5 Crested dog's-tail *Cynosurus cristatus* – common knapweed *Centaurea nigra* grassland has also been highlighted. Further information on the vegetation was required to inform a suitable management plan within the proposed development (see Appendix B).

## Site Location

The site is located to the east of Newgate Lane in Fareham, Hampshire centred at OS Grid Reference SU570031 (Figure 1). The fields currently comprises of horse-grazed paddocks and stables. The fields form part of farmland surrounded by the built-up areas of Fareham to the north, Gosport to the east and south, and Stubbington to the west.

Historic maps Ordnance Survey maps available on the National Library of Scotland website (<https://maps.nls.uk/>) suggest these fields were originally part of Peel Common and were rough pasture in 1856, being enclosed from Newgate Lane sometime between 1989 and 1930. They are have sandy loam to clayey loam soils derived to old estuarine mud and sand deposits formed over Wittering Formation sedimentary bedrocks. The land is relatively low-lying and prone to occasional winter flooding.



## Development Proposals

The proposals for the wider development site are for up to 115 dwellings, with associated infrastructure, parking and landscaping (Appendix A). This report relates to previously horse-grazed paddocks adjacent to Newgate Lane only.

## Methods

The site was visited on 5<sup>th</sup> August 2020 by WYG Senior Ecologist John Simper MCIEEM to do the initial chamomile survey; the weather conditions were overcast with no rain and mild. The NVC survey and additional plants survey was undertaken on 26 October 2020 by WYG’s specialist botanist Dr Tim Rich BSc, PhD, MCIEEM in dry and sometimes sunny weather.

The distribution and abundance of chamomile on site was recorded. Plant species frequencies across all four meadows were recorded using the DAFOR scale (D= dominant, A = abundant, F = frequent, O = occasional, R= rare) as estimated by eye.

A separate detailed National Vegetation Classification (NVC) survey (also known as a British Plant Communities survey) was carried out on 26 October 2020 to assess the vegetation type (see WYG, 2020). Dr Rich has 37 years of experience using with the NVC, and was the first post-doctoral Research Associate in the Unit of Vegetation Science, University of Lancaster using the NVC to assess impacts of climate change and air pollution on calcicolous vegetation. He has carried out many NVC surveys and has written some of the standard guidelines on carrying out NVC surveys (cf. Section 6.1.6 of Hill et al. 2005).

The survey followed the standard method (Rodwell, 2006) concentrating on the three ungrazed grasslands in the north of the site. The southern field was heavily grazed by three ponies who were somewhat frisky so for safety reasons this field was viewed from outside the fence only. Other vegetation such as bramble scrub was not surveyed to NVC level.

The quadrats were deliberately selected to represent the range of grasslands present on the site, which comprised short areas with chamomile and longer areas with rye grass, and some more intermediate grassland. For each quadrat, the GPS location was noted and a photograph taken. Vegetation cover and height were estimated by eye. Species were recorded in 2 m x 2 m quadrats using the DOMIN cover scale estimated by eye as shoot frequency (Table 1).

**Table 1 Cover Ranges for DOMIN Cover Scale**

Domin Cover Value	% Cover Range
10	91-100%
9	76-90%
8	51-75%
7	34-50%
6	26-33%
5	11-25%
4	4-10%
3	<4%; many individuals
2	<4%; several individuals
1	<4%; few individuals



Five quadrats were recorded in each vegetation type to allow constancy tables to be compiled. Constancies were calculated as follows (Rodwell 2006): V = 81-100% quadrats, IV = 61-80% quadrats, III = 41-60% quadrats, II = 21-40 % quadrats, I = 1-20% quadrats.

Allocation of the NVC communities was carried out by comparison of the constancy tables against the NVC tables, and also by running each quadrat through the mesotrophic grassland key. A further comparison was carried out using the Modular Analysis of Vegetation Information System (MAVIS) software (Smart et al., 2016). This software calculates a similarity coefficient between the quadrat sample(s) and the NVC tables using the Czekanowski coefficient with down-weighting to 0.1 of species not present in the input data but present at constancy I (1-20%) in the NVC tables (Smart *et al.*, 2016). The top 10 matching coefficients are displayed and indicate potential matches against NVC communities, but must be used with caution and are indications of possible relationships rather than statements of fact (Palmer, 1992). Included in the MAVIS package are new communities not covered in the published NVC volumes (Smart et al., 2016).

Scientific names in *italics* are given at the first mention of a species' name and thereafter by their common species name, following the standard British flora (Stace 2019).

## Limitations

The optimal period for botanical surveys is generally between April and September. The initial survey was completed within the optimal period with the secondary NVC survey in October, but due to the mild autumn with good weather and the ungrazed condition of the three northern fields was perfectly adequate for assessing the grassland NVC type, though some species which appear early in the season and die down by early summer will have been missed (e.g. the spring-flowering lesser celandine *Ficaria verna*). These species may also be absent within the optimal season and if present would not result in any change in the assessment of grassland NVC type. The timing of the surveys is therefore not considered to be a constraint to the survey or NVC determination.

The southern-most field was grazed by horses during the second visit and was not entered for safety reasons. As far as could be assessed from the edges, this field is of similar composition to the three other ungrazed fields.

## Results

Chamomile was found to be abundant throughout the survey area, particularly in areas of shorter sward height such as in shallow ditches or in areas grazed by rabbits (Photograph 1), but dense areas of rye grass in horse latrine areas had little or no chamomile. The site was ungrazed at the time of the surveys resulting in a sward height of 10-20 cm (30-40 cm including the grass inflorescences) over most of the site (Photograph 2), a significant change from the condition at the time of the previous surveys on site. Bramble scrub was found to be colonising a few places in the fields (Photograph 3).

# Chamomile Management Plan



**Photograph 1:** Chamomile in shallow ditch



**Photograph 2:** Ungrazed grassland



**Photograph 3:** Scrub becoming established in the south of the survey area.



A combined list of plant species seen during both surveys is given in Table 2. Despite the local abundance of rye grass, the fields were unimproved neutral grassland with many old-grassland indicator species such as the abundance of chamomile and smaller quantities of corky-fruited water-

# Chamomile Management Plan



dropwort *Oenanthe pimpinelloides*, pepper-saxifrage *Silaum silaus*, meadow barley *Hordeum secalinum* and hoary ragwort *Jacobaea erucifolius*.

**Table 2. Plant species recorded in the fields.**

Plant species	DAFOR frequency
Crested dog's tail <i>Cynosurus cristatus</i>	Dominant
Perennial rye-grass <i>Lolium perenne</i>	Locally dominant
Common bent <i>Agrostis capillaris</i>	Abundant
Chamomile <i>Chamaemelum nobile</i>	Abundant
Creeping bent <i>Agrostis stolonifera</i>	Frequent
Yorkshire-fog <i>Holcus lanatus</i>	Frequent
Cat's-ear <i>Hypochaeris radicata</i>	Frequent
Meadow buttercup <i>Ranunculus acris</i>	Frequent
Autumn hawkbit <i>Scorzoneroides autumnalis</i>	Frequent
Common bird's-foot trefoil <i>Lotus corniculatus</i>	Locally abundant
Common nettle <i>Urtica dioica</i>	Very locally abundant
Common knapweed <i>Centaurea nigra</i>	Very locally frequent
Hairy sedge <i>Carex hirta</i>	Occasional
Bilbao fleabane <i>Erigeron floribundus</i>	Occasional
Red fescue <i>Festuca rubra</i>	Occasional
Lesser hawkbit <i>Leontodon saxatilis</i>	Occasional
Red bartsia <i>Odontites vernus</i>	Occasional
Ribwort plantain <i>Plantago lanceolata</i>	Occasional
Creeping cinquefoil <i>Potentilla reptans</i>	Occasional
Selfheal <i>Prunella vulgaris</i>	Occasional
Fleabane <i>Pulicaria dysenterica</i>	Occasional
Creeping buttercup <i>Ranunculus repens</i>	Occasional
Bramble <i>Rubus fruticosus</i>	Occasional
Clustered dock <i>Rumex conglomeratus</i>	Occasional
Dandelion <i>Taraxacum</i> agg.	Occasional
Red Clover <i>Trifolium pratense</i>	Occasional
White clover <i>Trifolium repens</i>	Occasional
Scentless mayweed <i>Tripleurospermum inodorum</i>	Occasional
Yarrow <i>Achillea millefolium</i>	Rare
Meadow foxtail <i>Alopecurus pratensis</i>	Rare
Cuckooflower <i>Cardamine pratensis</i>	Rare
Spear thistle <i>Cirsium vulgare</i>	Rare
Hawthorn <i>Crataegus monogyna</i>	Rare
Cock's-foot <i>Dactylis glomerata</i>	Rare
Willowherb <i>Epilobium</i> sp.	Rare
Bristly Oxtongue <i>Helminthotheca echioides</i>	Rare
Meadow barley <i>Hordeum secalinum</i>	Rare
Hoary ragwort <i>Jacobaea erucifolius</i>	Rare
Ragwort <i>Jacobaea vulgaris</i>	Rare
Hard rush <i>Juncus inflexus</i>	Rare
Corky-fruited water-dropwort <i>Oenanthe pimpinelloides</i>	Rare
Timothy <i>Phleum pratense</i>	Rare
Greater plantain <i>Plantago major</i>	Rare

# Chamomile Management Plan



Silverweed <i>Potentilla anserina</i>	Rare
Bulbous buttercup <i>Ranunculus bulbosus</i>	Rare
Common sorrel <i>Rumex acetosa</i>	Rare
Broad-leaved Dock <i>Rumex obtusifolius</i>	Rare
Elder <i>Sambucus nigra</i>	Rare
Tall fescue <i>Schedonorus arundinaceus</i>	Rare
Pepper-saxifrage <i>Silaum silaus</i>	Rare
Chickweed <i>Stellaria media</i>	Rare

Figure 2 shows the vegetation mapped and the location of the grassland quadrats. The grassland quadrats are tabulated in Appendix C, with photographs of each quadrat and the MAVIS similarity coefficients.

The quadrats placed in the shorter areas of grassland (quadrats 1, 2, 4, 8, 9) show this was an MG6 *Lolium perenne* - *Cynosurus cristatus* grassland dominated by a mixture of crested dog's-tail and rye grass *Lolium perenne* grassland, with constant common bent *Agrostis capillaris*, chamomile, crested dog's-tail, Yorkshire fog *Holcus lanatus*, rye grass, meadow buttercup *Ranunculus acris* and autumn hawkbit *Scorzoneroides autumnalis* (Table 3). The vegetation fits best the MG6b sweet vernal-grass *Anthoxanthum odoratum* sub-community, though sweet vernal-grass itself was not seen on site. This classification is supported by the MAVIS similarity coefficients for the five quadrats combined (Table 4) which give the closest match to MG6b *Lolium perenne*-*Cynosurus*, *Anthoxanthum odoratum* sub-community or the community as a whole. This vegetation type occurs on lighter-textured soils in grazed pastures throughout Britain (Rodwell 1992).

**Table 3. Constancy table for shorter chamomile grasslands (quadrats 1, 2, 4, 8, 9). Figures for species are Domin cover values. Constancies are calculated as above.**

Quadrat	1	2	4	8	9	Constancy
<i>Agrostis capillaris</i>	8	7	8	9	7	V
<i>Chamaemelum nobile</i>	3	5	5	7	3	V
<i>Cynosurus cristatus</i>	7	6	6	6	6	V
<i>Holcus lanatus</i>	3	3	3	2	2	V
<i>Lolium perenne</i>	6	5	4	3	4	V
<i>Ranunculus acris</i>	2	3	3	2	1	V
<i>Scorzoneroides autumnalis</i>	2	2	2	3	3	V
<i>Festuca rubra</i>	2		1	1	4	IV
<i>Hypochaeris radicata</i>		1	1	4	1	IV
<i>Trifolium pratense</i>	3	2	4		1	IV
<i>Agrostis stolonifera</i>		4		2	2	III
<i>Lotus corniculatus</i>	3		6	4		III
<i>Plantago lanceolata</i>			1	2	1	III
<i>Centaurea nigra</i>	1				8	II
<i>Jacobaea vulgaris</i>	1		1			II
<i>Leontodon saxatilis</i>				2	2	II
<i>Potentilla reptans</i>	1				3	II
<i>Taraxacum agg.</i>			1		1	II
<i>Achillea millefolium</i>					5	I
<i>Cardamine pratensis</i>	2					I
<i>Carex hirta</i>				2		I

# Chamomile Management Plan



<i>Odontites verna</i>				3		I
<i>Prunella vulgaris</i>		1				I
<i>Pulicaria dysenterica</i>	1					I
<i>Quercus robur seedling</i>	1					I
<i>Ranunculus bulbosus</i>					3	I
<i>Ranunculus repens</i>				3		I
<i>Rumex conglomeratus</i>			1			I
<i>Trifolium repens</i>					2	I

**Table 4. MAVIS similarity coefficients for grouped shorter chamomile grasslands (quadrats 1, 2, 4, 8, 9).**

NVC community	MAVIS similarity coefficient
MG6b <i>Lolium perenne</i> - <i>Cynosurus cristatus</i> , <i>Anthoxanthum odoratum</i> sub-community	57.28
MG6b <i>Lolium perenne</i> - <i>Cynosurus cristatus</i> grassland	55.45
MG6a <i>Lolium perenne</i> - <i>Cynosurus cristatus</i> , typical sub-community	53.91
MG4b <i>Alopecurus pratensis</i> - <i>Sanguisorba officinalis</i> grassland Typical subcommunity	53.64
MG4 <i>Alopecurus pratensis</i> - <i>Sanguisorba officinalis</i> grassland (redefined)	52.11
MG6d (v2) <i>Lolium perenne</i> - <i>Cynosurus cristatus</i> grassland <i>Filipendula ulmaria</i> subcommunity	51.89
MG8v2 <i>Cynosurus cristatus</i> - <i>Carex panicea</i> - <i>Caltha palustris</i> grassland <i>Caltha palustris</i> - <i>Bellis perennis</i> subcommunity	51.09
MG5a <i>Cynosurus cristatus</i> - <i>Centaurea nigra</i> grassland, <i>Lathyrus pratensis</i> sub-community	50.84
MG11a <i>Festuca rubra</i> - <i>Agrostis stolonifera</i> - <i>Potentilla anserina</i> grassland, <i>Lolium perenne</i> sub-community	44.92
MG10a <i>Holcus lanatus</i> - <i>Juncus effusus</i> rush-pasture, typical sub-community	44.81

The quadrats placed in the longer areas of grassland which are horse latrines were probably best treated as MG7 *Lolium perenne* leys and related grasslands, dominated by rye grass with common bent, Yorkshire fog, rye grass and meadow buttercup (Table 5). The MAVIS similarity coefficients for the five quadrats combined (Table 5) showed only a small range in values and MG7 is a close fifth in the rankings. Of these, quadrats 5 and 6 were placed on the edges of the horse latrine areas as the vegetation types intergrade, and they include some species of the MG6 *Lolium - Cynosurus* grasslands as well as chamomile.

**Table 5. Constancy table for longer rank grasslands in horse latrines (quadrats 3, 5, 6, 7, 10). Figures for species are Domin cover values. Constancies are calculated as above.**

Quadrat	3	5	6	7	10	Constancy
<i>Agrostis capillaris</i>	5	6	6	2	5	V
<i>Holcus lanatus</i>	3	7	4	1	3	V
<i>Lolium perenne</i>	9	6	3	6	9	V
<i>Ranunculus acris</i>	1	3	2	1	1	V
<i>Chamaemelum nobile</i>		3	4		1	III
<i>Cynosurus cristatus</i>			6	9	4	III

# Chamomile Management Plan



<i>Festuca rubra</i>	1	1			1	III
<i>Ranunculus repens</i>		2	2		4	III
<i>Scorzoneroïdes autumnalis</i>			3		2	II
<i>Centaurea nigra</i>		1			2	II
<i>Carex hirta</i>		3		2		II
<i>Hypochaeris radicata</i>			2			I
<i>Lotus corniculatus</i>			3			I
<i>Leontodon saxatilis</i>					2	I
<i>Rumex acetosa</i>	1					I
<i>Odontites verna</i>			1			I
<i>Prunella vulgaris</i>			2			I
<i>Pulicaria dysenterica</i>		1				I
<i>Rumex conglomeratus</i>	2					I
<i>Trifolium repens</i>			2			I

**Table 6. MAVIS similarity coefficients for grouped shorter chamomile grasslands (quadrats 1, 2, 4, 8, 10).**

NVC community	MAVIS similarity coefficient
MG6d <i>Lolium perenne</i> - <i>Cynosurus cristatus</i> grassland <i>Filipendula ulmaria</i> subcommunity	48.72
MG4c <i>Alopecurus pratensis</i> - <i>Sanguisorba officinalis</i> grassland <i>Holcus lanatus</i> subcommunity	47.48
MG6a <i>Lolium perenne</i> - <i>Cynosurus cristatus</i> , typical sub-community	47.31
MG9 <i>Holcus lanatus</i> - <i>Deschampsia cespitosa</i> grassland	46.63
MG7 <i>Lolium perenne</i> leys and related grasslands	46.02
MG15b <i>Alopecurus pratensis</i> - <i>Poa trivialis</i> - <i>Cardamine pratensis</i> grassland <i>Lolium perenne</i> <i>Ranunculus acris</i> subcommunity	45.98
MG6b <i>Lolium perenne</i> - <i>Cynosurus cristatus</i> , <i>Anthoxanthum odoratum</i> sub-community	45.68
MG15 <i>Alopecurus pratensis</i> - <i>Poa trivialis</i> - <i>Cardamine pratensis</i> grassland.	45.56
MG11a <i>Festuca rubra</i> - <i>Agrostis stolonifera</i> - <i>Potentilla anserina</i> grassland, <i>Lolium perenne</i> sub-community	44.92
MG10a <i>Holcus lanatus</i> - <i>Juncus effusus</i> rush-pasture, typical sub-community	44.81

In addition to the grasslands, there were a few areas of bramble scrub and rank vegetation mainly comprising nettles *Urtica dioica* around the stables and dung heaps (Figure 2); these have not been NVC-mapped in this study which concentrated on the grasslands.

## Discussion

The pastures with most chamomile were classified as MG6b *Lolium perenne* - *Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community, which occurs on grazed pastures throughout Britain (Rodwell 1992). This is a vegetation type which would be expected on pastures derived from former common land with a long history of heavy grazing. This may also explain the abundance of chamomile across the site as it is a species selectively avoided by grazing animals such as horses. These short MG6b grasslands graded into long rank grassland in horse latrine areas which were classified as MG7 *Lolium perenne* leys due to the dominance by rye grass.

# Chamomile Management Plan



Other than the abundance of rye grass, there was little sign the meadows have ever been agriculturally-improved by ploughing, reseeding or fertiliser application; the ground is uneven with some wet hollows and there are plants indicative of unimproved conditions such as chamomile, with smaller quantities of corky-fruited water-dropwort *Oenanthe pimpinelloides*, pepper-saxifrage *Silaum silaus*, meadow barley *Hordeum secalinum* and hoary ragwort *Jacobaea erucifolius*. The abundance of rye grass in the latrine areas may be explained as a result of the high levels of nutrients in the latrines, probably augmented by high stocking levels due to supplementary winter feeding of the horses. The rye grass does not appear to have been sown, and fertiliser is unlikely to have been applied as rich grass can cause laminitis in horses; however, no details of historic management are known.

One area in the southern of the two central fields had frequent common knapweed in the south-west quarter (Figure 2). Common knapweed is a characteristic species of the community MG5 *Cynosurus cristatus-Centaurea nigra* grassland, but here was not associated with other constants of the MG5 community such as bird's-foot trefoil *Lotus corniculatus* or red clover *Trifolium pratense* (though both these are present at low frequency). MG5 grasslands are typical hay meadow communities and tend to be managed by mowing often with aftermath grazing, rather than by continuous heavy grazing which is more typical of MG6 communities.

## Management recommendations

### Objectives and Principles

Based on the findings of the botanical surveys, and comments from the Local Planning Authority Ecologist, there are two objectives for the management of the site:

- maintain, and if possible enhance, the abundance of chamomile; and
- create a lowland meadow habitat.

These objectives have differing management requirements. For example, chamomile thrives in short, disturbed swards (as was present on site previously when grazed). In the absence of management it will become overgrown by more vigorous grasses and herbs, with the sward more closely resembling a traditional meadow. Lowland meadows provide a contrasting habitat, with long grass preferred by a different range of species such as knapweed, corky-fruited water-dropwort, pepper-saxifrage and hoary ragwort.

Therefore a compromise approach is proposed whereby the shorter grassland central portions of the area, which will be used as public open space, will be managed for chamomile. The outer portions of and the longer rank grasslands in former latrine areas will be managed as a longer sward in the manner of a traditional hay meadow to support taller species. The proposed management plan is shown in Figure 3 and has been informed by the existing communities and their distribution shown in Figure 2.

The boundary between the Chamomile Area and Meadow Area will be demarcated by a 500mm wide concrete edging set flush into the ground to make sure that mowing does not drift beyond the specified areas. This strip will be subject to scraping annually in September to prevent the edging from becoming obscured by mud or vegetation.

# Chamomile Management Plan



As shown in Figure 3, the proposed play area will be located on the footprint of existing stable buildings and rank vegetation to avoid any loss of higher value grassland.

## Chamomile areas

Chamomile prefers short swards such as those created by heavy grazing or frequent mowing regimes (Plantlife, 2020). Recreational use of the area resulting in increased trampling by walkers will benefit chamomile and should not be discouraged off pathways.

From April to August the majority of the interior grassland of the site (Figure 2) should be mown fortnightly to a height of 50 mm. In September/October the mowing should take place once a month to let the chamomile set seed. No cutting is required during the winter. Arisings should be removed following each cut to reduce nutrient input into the soil.

## Meadow area

To encourage general wildflower diversity on site and create a Lowland Meadow habitat, areas managed as long grass will be established around the fields on the current latrine areas to avoid any chamomile (Figure 2) and managed as hay meadows.

As these are in latrine areas it will first be necessary to reduce the nutrient loads, which is best done by repeated heavy mowing and removal of cuttings for the first three years; this can be carried out fortnightly at the same time as the chamomile areas are mown.

Thereafter mowing will take twice a year in early July and September with the west side cut in early July and the east side cut in September, alternating timings between different years. The cut should aim for a sward height of 150mm and all arisings should be removed from the site.

## Scrub Management

Chamomile is sensitive to shading, therefore areas of scrub that are encroaching into grassland will be cleared using hand tools, ideally during the winter months (October to February) to avoid the bird nesting season. The arisings will be removed from site.

Further scrub encroachment is likely to be suppressed by the mowing regime but this should be monitored yearly with target removal taking place where necessary.

The exception to this will be the boundary of the management area, which is demarcated by a wire fence). Along the fence line, scrub will be allowed to establish to provide an additional element of habitat variation and habitat to fauna. However, the above management will be undertaken to prevent scrub along the site boundary from encroaching the areas of grassland (which are the principle aims of the management plan).

## Nutrient and Chemical Control

No fertilizers or herbicides will be used as part of the management of the area. All arisings will be removed following management to reduce nutrient levels within the soil.

# Chamomile Management Plan



An increase in nutrients resulting from an increase in dog waste has the potential to alter the botanical diversity of the site (in localised areas). Dog waste bins and associated signage will therefore be installed to minimise impacts resulting from dog waste.

## Management Timetable

The timings of the cutting regimes for the chamomile area and the meadow area are shown in Table 2.

**Table 2. Management for chamomile.**

Year	Chamomile area	Meadow area
1	Mowing to 50 mm fortnightly April to August with removal of cuttings and monthly in September and October, no cutting during winter	Mowing fortnightly April-October with removal of cuttings to reduced nutrient load
2	Mowing to 50 mm fortnightly April to August with removal of cuttings and monthly in September and October, no cutting during winter	Mowing fortnightly April-October with removal of cuttings to reduced nutrient load
3	Mowing to 50 mm fortnightly April to August with removal of cuttings and monthly in September and October, no cutting during winter	Mowing fortnightly April-October with removal of cuttings to reduced nutrient load
4	Mowing to 50 mm fortnightly April to August with removal of cuttings and monthly in September and October, no cutting during winter	West side mown July with removal of cuttings, east side mown September with removal of cuttings
5	Mowing to 50 mm fortnightly April to August with removal of cuttings and monthly in September and October, no cutting during winter	West side mown September with removal of cuttings, east side mown July with removal of cuttings
6 etc	Mowing to 50 mm fortnightly April to August with removal of cuttings and monthly in September and October, no cutting during winter	West side mown July with removal of cuttings, east side mown September with removal of cuttings

## Monitoring

During the construction phase, management will be the responsibility of the developer and compliance visits will be conducted bi-monthly between April and October to make sure the correct actions are being undertaken. Following the transfer of the open space (including the Chamomile and Meadow Areas) ongoing monitoring will be the responsibility of the owner.

# Chamomile Management Plan



Post-development monitoring should take place every third year for a period of 30 years to make sure that the management prescriptions are successful in retaining and enhancing chamomile and creating a botanically rich meadow area. It is expected that there may be some annual variation in the abundance and distribution of chamomile on site due to climatic conditions, therefore short term monitoring is not considered necessary.

Chamomile cover averaged about 5-10% (range c. 2%-40%) across the short grasslands areas in 2020; it should be aimed to ensure this chamomile cover is maintained. Chamomile monitoring should take place every three years in July-August by estimating cover in thirty 1 m<sup>2</sup> randomly quadrats spaced throughout the short grassland areas. Monitoring should preferably take place a fortnight after a cut and prior to any cut taking place.

The results of all monitoring will be reported back to the LPA. If corrective action is required a suitably qualified ecologist should be consulted to provide advice as to the necessary actions required. This may require further NVC survey to determine changes in the vegetation.

## Summary

The site requires appropriate management to allow chamomile to thrive and to encourage a high botanical diversity. The following measures are recommended:

- Interior of the site to cut fortnightly during the summer to allow chamomile be maintained and enhanced on site, and monthly in autumn.
- Once nutrient levels have reduced after three years by fortnightly mowing, longer grassland areas around the site to be managed as lowland meadow ensuring sides are cut alternately in early July and late September.
- Removal of encroaching scrub.
- All arisings to be removed from site.
- Provision of dog waste bins and associated signage in order to reduce nutrient inputs.

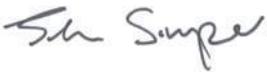
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# Chamomile Management Plan



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Version:	Date:	Updated by:	Verified by:	Description of changes:
2	October 20	T. Rich	D. West	Updated to include NVC findings and amended management areas.
3	November 20	D. West	D. West	Updated to address comments from Nick Sibbett.

*WYG Environment Planning Transport Ltd. accept no responsibility or liability for the use which is made of this document other than by the Client for the purpose for which it was originally commissioned and prepared.*



## **Figure 1: Site Location**

## **Figure 2: NVC Plan**

## **Figure 3: Chamomile Management Plan**







5V \$	DVH	R/M/V Q.WLDO BSSURGAWLRQ
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- HJQG**
- &VUYHDUHD
  - ,QGLFDWL YHDFPHWURDG
  - RQJUDV DUHDV FAW WZ FHDHJ
  - ,QGLFDWL YHSDDDUHD
  - \$JHDV R VKRUV JUDWO DOGBODJGIRU FKORPOH
  - ..... ,QGLFDWL YHIRRWSOVK



3.RM-GFOPCHDDHON SDDQ

HDMHDHRWKDGGYK DUHP  
DUKPOGSDG%QUDWHREV

6DDHVS \$	3.RMHW R \$	UDZOR LJUH	5MLRQ \$
UDZE %Q%OREUV	UDZGVH	SSRFGE Z.RL.FK	

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# **Appendix A. Illustrative masterplan for site including area to be managed for chamomile (see Figure 2)**



-  APPLICATION BOUNDARY
- LAND USE:**
-  RESIDENTIAL PARCELS
-  PRIMARY FRONTAGE
-  SECONDARY FRONTAGE
-  PUBLIC OPEN SPACE
- ACCESS AND CONNECTIONS:**
-  PROPOSED ACCESS
-  RETAINED EXISTING ACCESS TO HAMBROOK LODGE
-  PRIMARY SPINE ROAD
-  SECONDARY ROAD
-  TERTIARY ROAD
-  FOOTPATH CONNECTIONS
-  FOOTPATHS KEY NODE
- GREEN AND BLUE INFRASTRUCTURE:**
-  EXISTING VEGETATION
-  PROPOSED VEGETATION
-  PROPOSED LEAP (400SQM WITH 20M OFFSET)
-  DRAINAGE CHANNELS
-  INDICATIVE ATTENUATION
- OTHER:**
-  PROPOSED PUMPING STATION (MIN 12M X 8M WITH 15M OFFSET)

LAND ADJACENT TO NEWGATE LANE, FAREHAM - ILLUSTRATIVE FRAMEWORK MASTERPLAN - SOUTHERN PARCEL

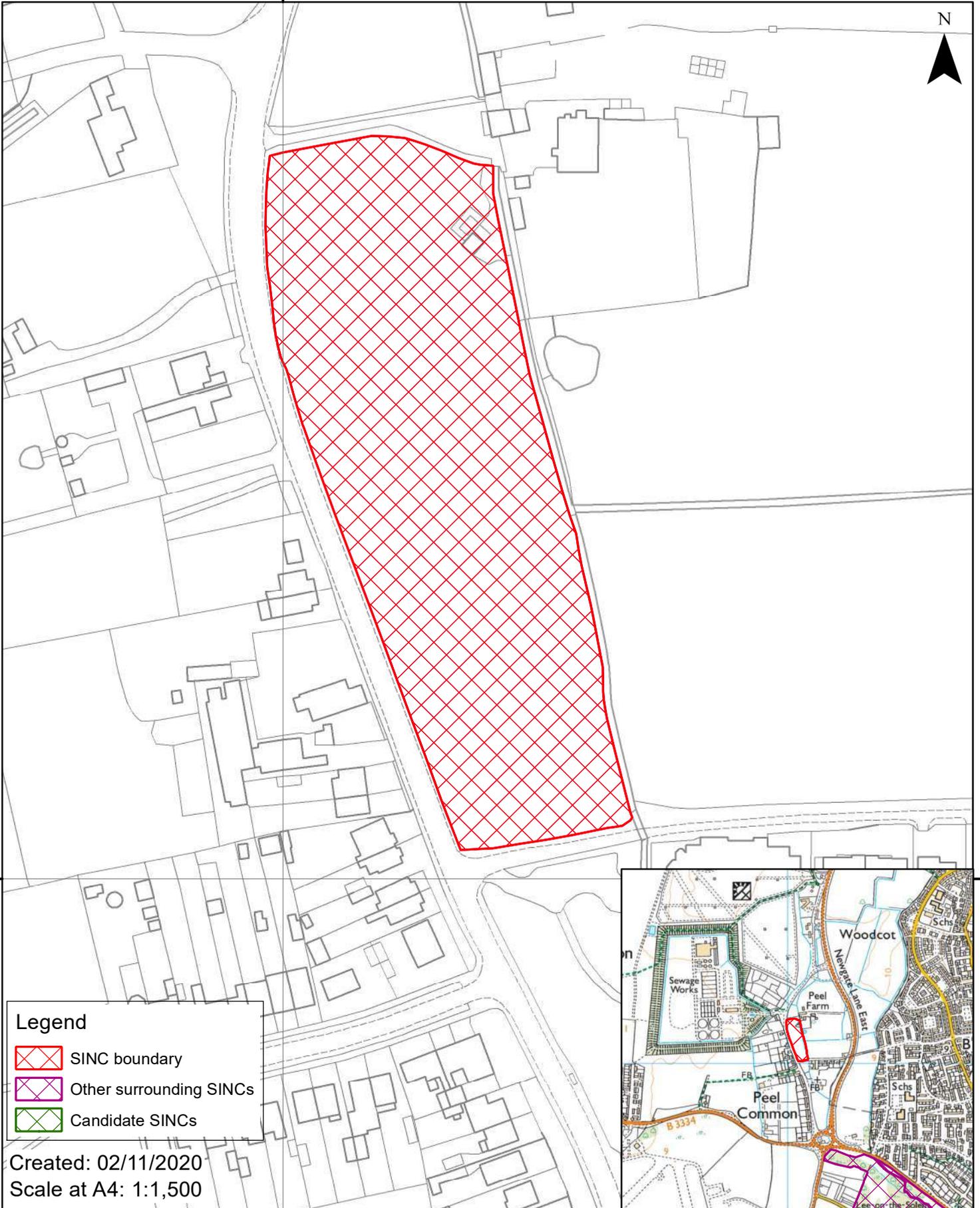




# **Appendix B. SINC Boundary**

457000

N



**Legend**

-  SINC boundary
-  Other surrounding SINC's
-  Candidate SINC's

Created: 02/11/2020  
 Scale at A4: 1:1,500

457000



Site of Importance for Nature Conservation:

SINC Name: Meadows North of Woodcote Lane, Peel Common  
 Grid Ref: SU57050312  
 SINC Ref: FA0113



## Appendix C – Quadrat data

### QUADRAT 1

GPS Location: SU5701103201



Cover 100%, Height 10 cm.  
Typical short open chamomile turf

<i>Agrostis capillaris</i>	8	<i>Lolium perenne</i>	6
<i>Cardamine pratensis</i>	2	<i>Lotus corniculatus</i>	3
<i>Centaurea nigra</i>	1	<i>Potentilla reptans</i>	1
<i>Chamaemelum nobile</i>	3	<i>Pulicaria dysenterica</i>	1
<i>Cynosurus cristatus</i>	7	<i>Quercus seedling/sp</i>	2
<i>Festuca rubra</i>	2	<i>Ranunculus acris</i>	2
<i>Holcus lanatus</i>	3	<i>Scorzoneroideis autumnalis</i>	2
<i>Jacobaea vulgaris</i>	1	<i>Trifolium pratense</i>	3

#### MAVIS similarity coefficients:

NVC: MG6b 42.58  
NVC: MG5a 41.79  
NVC: MG5 41.59  
NVC: MG4b 41.58  
NVC: MG6d 41.49

NVC: MG6 41.09  
NVC: MG5c 39.82  
NVC: MG5b 39.57  
NVC: MG4a 39.50  
NVC: MG6a 38.77

# Chamomile Management Plan



## QUADRAT 2

GPS Location: SU5703503189



Cover 100%, Height 10 cm.  
Typical short open chamomile turf

Agrostis capillaris	7	Lolium perenne	5
Agrostis stolonifera	4	Prunella vulgaris	1
Chamaemelum nobile	5	Ranunculus acris	3
Cynosurus cristatus	6	Scorzoneroïdes autumnalis	2
Holcus lanatus	3	Trifolium pratense	2
Hypochaeris radicata	1		

### MAVIS similarity coefficients:

NVC: MG6b	46.21	NVC: MG4b	38.23
NVC: MG6a	43.65	NVC: MG15b	37.30
NVC: MG6	42.89	NVC: MG5a	37.00
NVC: MG8d	38.46	NVC: MG10a	36.92
NVC: MG6d	38.25	NVC: MG8	36.78

# Chamomile Management Plan



## QUADRAT 3

GPS Location: SU5701703179



Cover 100%, Height 15 cm.

Rank former latrine area dominated by rye grass

Agrostis capillaris	5	Lolium perenne	9
Festuca rubra	1	Ranunculus acris	1
Holcus lanatus	3	Rumex conglomeratus	2

MAVIS similarity coefficients:

MG6b 41.18	MG7D 36.76
MG6 38.70	MG12a 36.68
MG6a 37.50	MG7 36.46
MG7E 37.20	MG10a 36.31
MC9e 37.15	MG11a 36.08

# Chamomile Management Plan



## QUADRAT 4

GPS Location: SU5701203176



Cover 100%, Height 8 cm.  
Typical short open chamomile turf

Agrostis capillaris	8	Lotus corniculatus	6
Chamaemelum nobile	5	Plantago lanceolata	1
Cynosurus cristatus	6	Ranunculus acris	3
Festuca rubra	3	Rumex conglomeratus	1
Holcus lanatus	3	Scorzoneroides autumnalis	2
Hypochaeris radicata	1	Taraxacum agg.	1
Jacobaea vulgaris	1	Trifolium pratense	4
Lolium perenne	4		

### MAVIS similarity coefficients:

NVC: MG6b	49.78	NVC: MG4b	44.82
NVC: MG5a	48.09	NVC: MG6a	44.82
NVC: MG5	48.00	NVC: MG5b	44.77
NVC: MG6	47.19	NVC: MG5c	44.63
NVC: MG6d	45.03	NVC: MG7E	43.70

# Chamomile Management Plan



## QUADRAT 5

GPS Location: SU5702203140



Cover 100%, Height 15 cm.

Relative long grass with little chamomile tending towards latrine area

Agrostis capillaris	6	Holcus lanatus	7
Carex hirta	3	Lolium perenne	6
Centaurea nigra	1	Pulicaria dysenterica	1
Chamaemelum nobile	3	Ranunculus acris	3
Cynosurus cristatus	6	Ranunculus repens	2
Festuca rubra	1	Rumex acetosa	1

MAVIS similarity coefficients:

NVC: MG6d 47.88

NVC: MG6b 45.99

NVC: MG6a 44.13

NVC: MG6 43.08

NVC: MG4c 42.58

NVC: MG15b 41.04

NVC: MG4b 40.60

NVC: MG8d 39.44

NVC: MG10a 38.68

NVC: MG4v2 38.53

# Chamomile Management Plan



## QUADRAT 6

GPS Location: SU5705103165



Cover 100%, Height 8 cm.  
Typical short open chamomile turf

Agrostis capillaris	6	Lotus corniculatus	3
Chamaemelum nobile	4	Odontites vernus	1
Cynosurus cristatus	9	Prunella vulgaris	2
Holcus lanatus	4	Ranunculus acris	2
Hordeum secalinum	3	Scorzoneroïdes autumnalis	3
Hypochaeris radicata	2	Trifolium repens	2
Lolium perenne	3		

### MAVIS similarity coefficients:

NVC: MG6b 46.07  
NVC: MG6 42.96  
NVC: MG6a 41.88  
NVC: MG5c 39.98  
NVC: MG5a 39.40

NVC: MG5 39.13  
NVC: MG6c 37.82  
NVC: MG4b 36.08  
NVC: MG4a 35.68  
NVC: MG8 35.59

# Chamomile Management Plan



## QUADRAT 7

GPS Location: SU5703603135



Cover 100%, Height 15 cm.  
Rank rye grass in latrine area

Agrostis capillaris	2	Phleum pratense	4
Agrostis stolonifera	4	Ranunculus acris	1
Carex hirta	2	Ranunculus repens	2
Holcus lanatus	1	Rumex obtusifolius	1
Lolium perenne	6	Stellaria media	1

### MAVIS similarity coefficients:

NVC: MG11a 46.70	NVC: MG15b 39.91
NVC: MG10b 46.30	NVC: MG7D 38.35
NVC: MG10a 45.41	NVC: MG6d 36.92
NVC: MG7B 43.78	NVC: MG4c 36.67
NVC: MG10 42.75	NVC: MG7 36.51

# Chamomile Management Plan



## QUADRAT 8

GPS Location: SU5705703099



Cover 100%, Height 8 cm.  
Typical short open chamomile turf

<i>Agrostis capillaris</i>	9	<i>Leontodon saxatilis</i>	2
<i>Agrostis stolonifera</i>	2	<i>Lolium perenne</i>	3
<i>Carex hirta</i>	2	<i>Lotus corniculatus</i>	4
<i>Chamaemelum nobile</i>	7	<i>Odontites vernus</i>	3
<i>Cynosurus cristatus</i>	6	<i>Plantago lanceolata</i>	2
<i>Festuca rubra</i>	2	<i>Ranunculus acris</i>	2
<i>Holcus lanatus</i>	2	<i>Ranunculus repens</i>	3
<i>Hypochaeris radicata</i>	4	<i>Scorzoneroides autumnalis</i>	3

### MAVIS similarity coefficients:

NVC: MG6b 45.26

NVC: MG6d 43.83

NVC: MG6 42.41

NVC: MG4b 42.22

NVC: MG5a 42.15

NVC: MG6a 41.95

NVC: MC9a 41.61

NVC: MG11a 41.16

NVC: MG5 40.80

NVC: MG8v2 40.35

# Chamomile Management Plan



## QUADRAT 9

GPS Location: SU5704003077



Cover 100%, Height 10 cm.

Species-rich grassland with knapweed and chamomile

<i>Achillea millefolium</i>	5	<i>Lolium perenne</i>	4
<i>Agrostis capillaris</i>	7	<i>Plantago lanceolata</i>	1
<i>Agrostis stolonifera</i>	2	<i>Potentilla reptans</i>	3
<i>Centaurea nigra</i>	8	<i>Ranunculus acris</i>	1
<i>Chamaemelum nobile</i>	3	<i>Ranunculus bulbosus</i>	3
<i>Cynosurus cristatus</i>	6	<i>Scorzoneroideis autumnalis</i>	3
<i>Festuca rubra</i>	4	<i>Taraxacum agg.</i>	1
<i>Holcus lanatus</i>	2	<i>Trifolium pratense</i>	1
<i>Hypochaeris radicata</i>	1	<i>Trifolium repens</i>	2
<i>Leontodon saxatilis</i>	2		

### MAVIS similarity coefficients:

NVC: MG6b 54.63

NVC: MG6 52.76

NVC: MG5a 52.51

NVC: MG5 52.51

NVC: MG6a 52.25

NVC: MG4b 51.18

NVC: MG5c 50.85

NVC: MG5b 50.35

NVC: MG6d 49.26

NVC: MG4a 48.80

# Chamomile Management Plan



## QUADRAT 10

GPS Location: SU5706003073



Cover 100%, Height 20 cm.  
Rank rye grass, latrine area

<i>Agrostis capillaris</i>	5	<i>Holcus lanatus</i>	3
<i>Alopecurus pratensis</i>	1	<i>Leontodon saxatilis</i>	2
<i>Centaurea nigra</i>	2	<i>Lolium perenne</i>	9
<i>Chamaemelum nobile</i>	1	<i>Ranunculus acris</i>	1
<i>Cynosurus cristatus</i>	4	<i>Ranunculus repens</i>	4
<i>Festuca rubra</i>	1	<i>Scorzoneroides autumnalis</i>	2

### MAVIS similarity coefficients:

NVC: MG6b 42.58  
NVC: MG5a 41.79  
NVC: MG5 41.59  
NVC: MG4b 41.58  
NVC: MG6d 41.49  
NVC: MG6 41.09  
NVC: MG5c 39.82  
NVC: MG5b 39.57  
NVC: MG4a 39.50  
NVC: MG6a 38.7

# Chamomile Management Plan

