

### High class soil introduction for Panel – Dr Reece Hill

The details of my analyses and discussion provided in my Technical Report for the S42A and Technical memo. I will summarise the main points based on the content of my report and memo. For ease of reference, the Figure and Table numbers are those used in my original report.

### High class soil definition

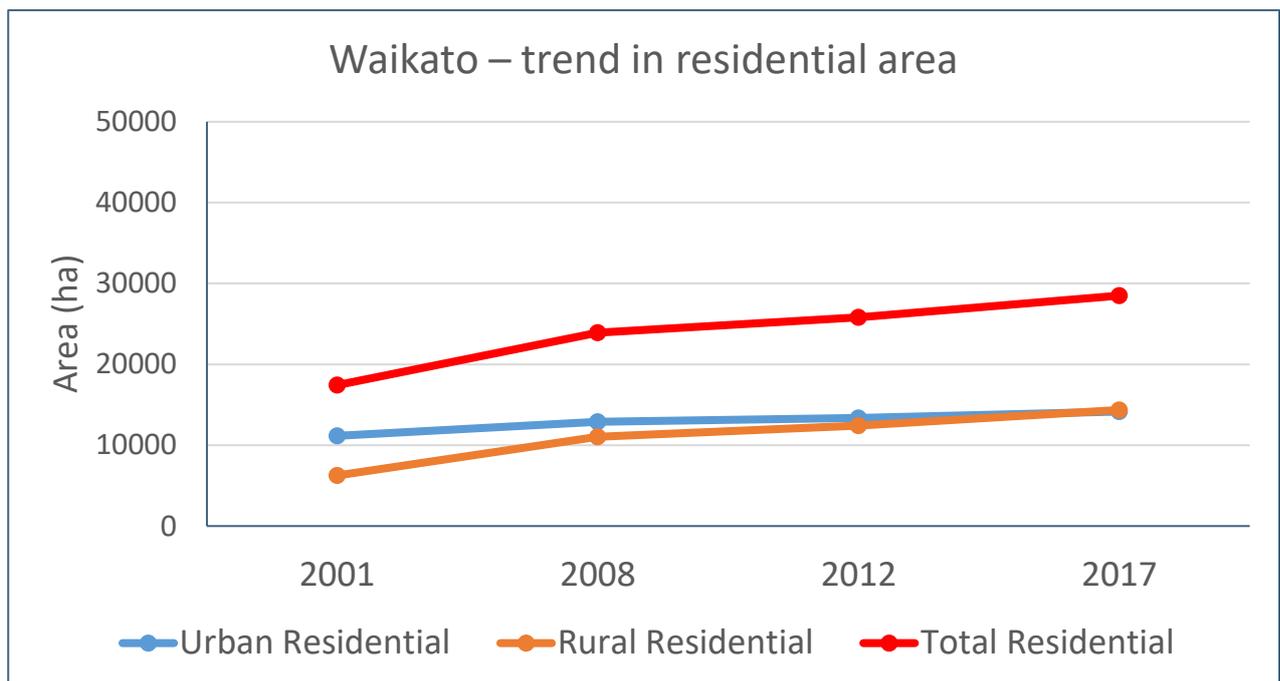
The notified version of Stage 1 of the Proposed Waikato District Plan defines high class soils as:

*...those soils in Land Use Capability Classes I and II (excluding peat soils) and soils in Land Use Capability Class IIIe1 and IIIe5, classified as Allophanic Soils, using the New Zealand Soil Classification.*

This definition aligns with the high class soils definition in the Waikato Regional Policy Statement. The Waikato Regional Policy Statement definition includes soils on LUC class 1, 2 and 3, with some exclusions that are seen as relevant to the Waikato region.

### High class soil loss in the Waikato

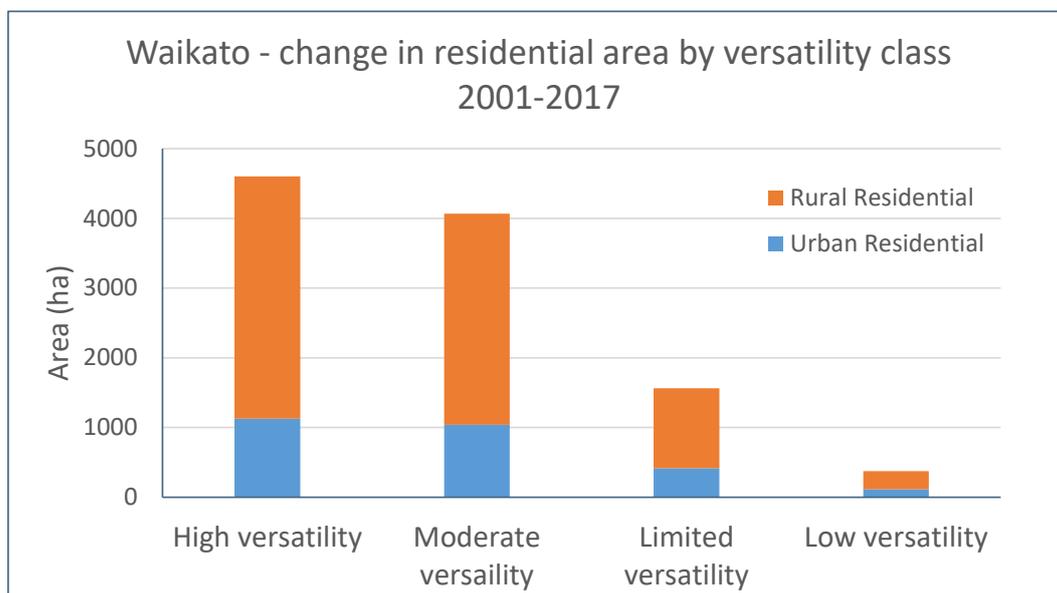
The land area for production in the Waikato region decreased by 11,998 ha between 2001 and 2017. Residential expansion is the key contributor to the loss of land potentially available for production. Additionally, increasing rural residential expansion showed that the loss of land was equally attributable to rural residential and urban residential expansion (**Figure 10**)<sup>1</sup>.



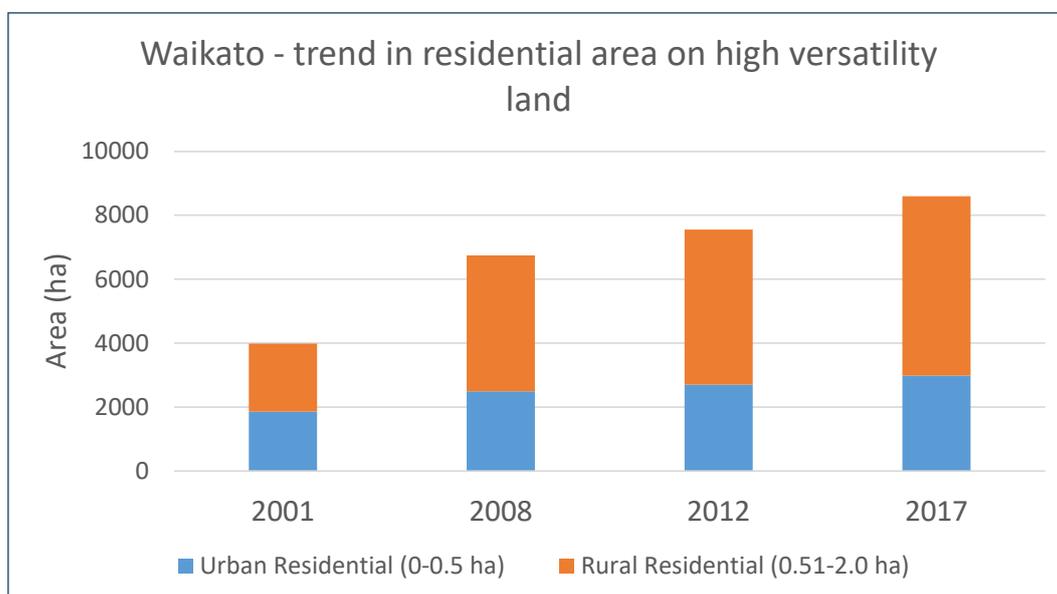
**Figure 10. The loss of productive land in the Waikato region to rural residential and urban residential expansion in the Waikato region (2001-2017).**

<sup>1</sup> Figure 10, page 36: Hill, R.B. (2020). A review of high class soils in the Waikato District. Report for Waikato District Council. Waikato District Council. Ngaruawahia.

Changes to residential area has occurred on the more versatile land (**Figure 11**<sup>2</sup>) and that residential expansion had continued to increase from 2001 to 2017, with a greater proportion of the change being attributable to rural residential expansion (**Figure 12**<sup>3</sup>).



**Figure 11. Change in residential area by versatility class for the Waikato region (2001-2017).**

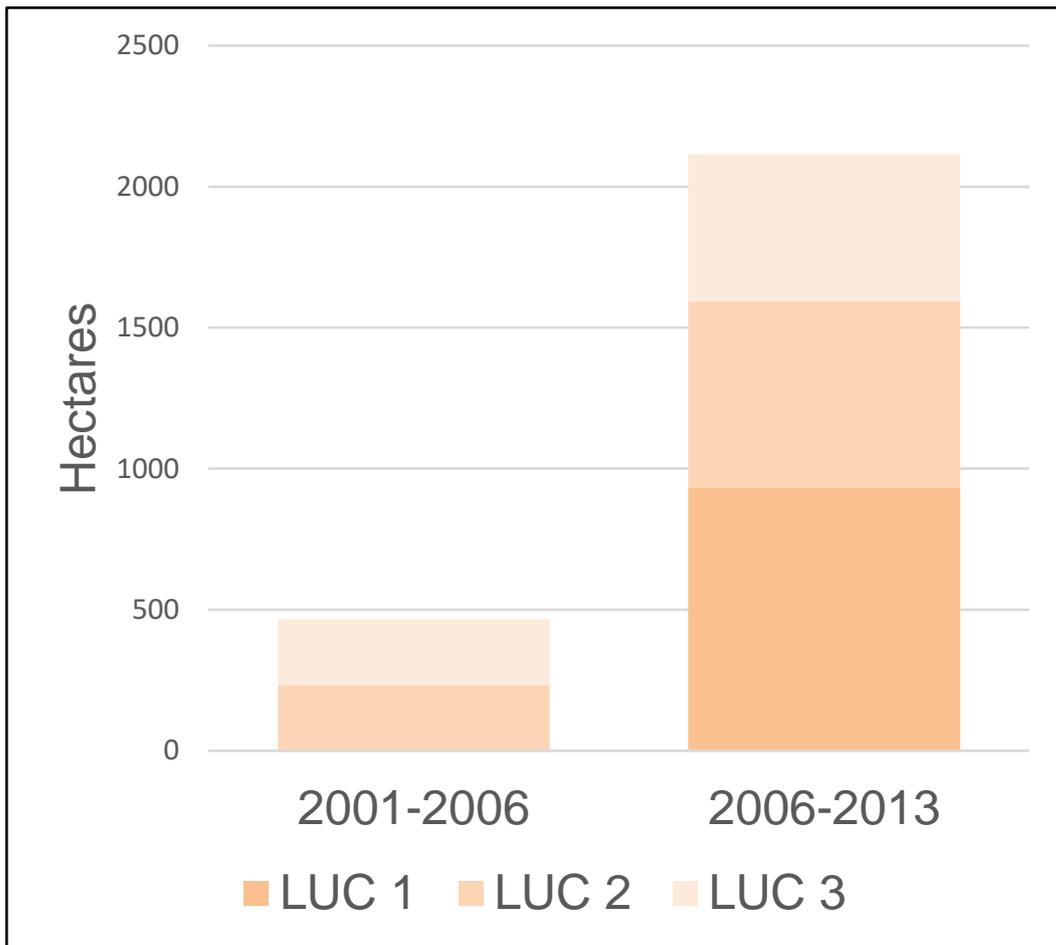


**Figure 12. Trend in residential area on highly versatile land for the Waikato region (2001-2017).**

<sup>2</sup> Figure 11, page 37: Hill, R.B. (2020). A review of high class soils in the Waikato District. Report for Waikato District Council. Waikato District Council. Ngaruawahia.

<sup>3</sup> Figure 12, page 37: Hill, R.B. (2020). A review of high class soils in the Waikato District. Report for Waikato District Council. Waikato District Council. Ngaruawahia.

A similar trend for LUC class 1, 2 and 3 soils is evident for the Waikato District (**Figure 9**<sup>4</sup>).



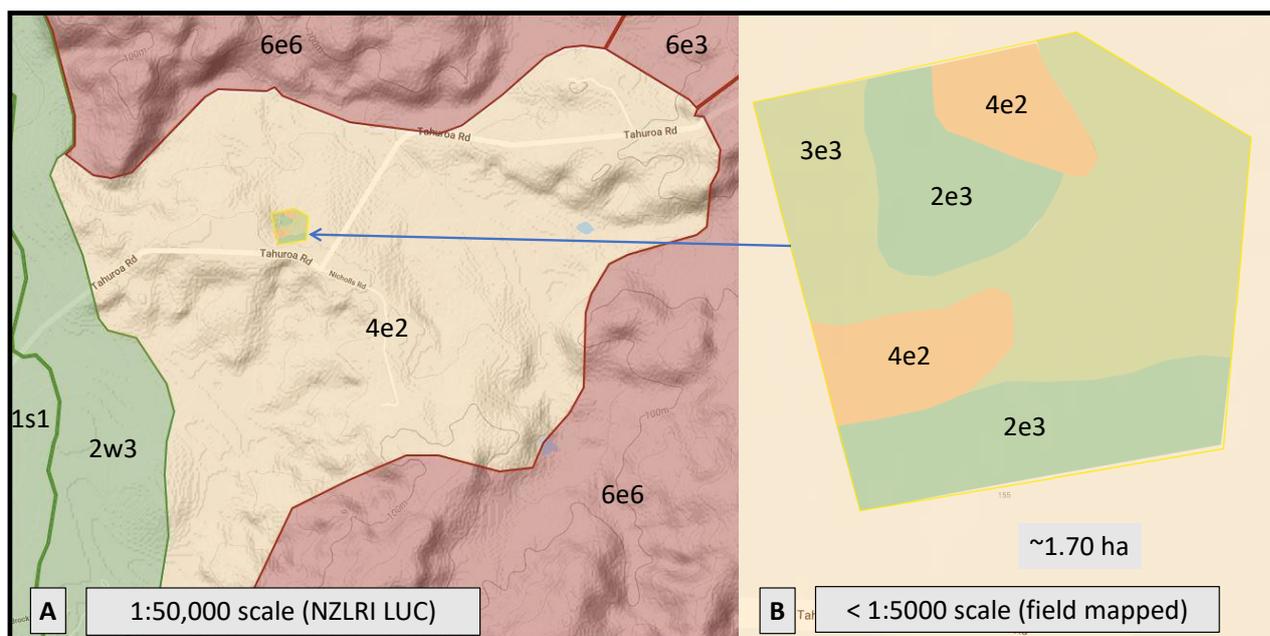
**Figure 9. Rural land subdivided in the Waikato district (2001-2006 and 2006-2013) on LUC Classes 1, 2 and 3.**

### Property scale site specific Land Use Capability (LUC) classification assessment

The accurate identification of high class soils is reliant on property scale map information. Regional map information such as the NZLRI (1:50,000 scale) LUC map information (shown in A) has scale limitations affecting high class soils; high class soils are not always identified and map unit boundaries are often inaccurate (see **Figure 2**)<sup>5</sup>.

<sup>4</sup> Figure 9, page 34: Hill, R.B. (2020). A review of high class soils in the Waikato District. Report for Waikato District Council. Waikato District Council. Ngaruawahia.

<sup>5</sup> Figure 2, page 27: Hill, R.B. (2020). A review of high class soils in the Waikato District. Report for Waikato District Council. Waikato District Council. Ngaruawahia.



**Figure 2. An example of the effect of the scale of map information; (A) 1:50,000 scale NZLRI LUC and (B) <1:5000 field map information.**

## National policy Statements

### Paragraph 24 (page 4)

- *While this NPS does not yet have any legal weight Dr Hill and I have been working to ensure that Council's provisions will give effect to this higher order document. Dr Hill and I have had the benefit of some insights into the final drafting, which we understand will be released by the Ministry for the Environment and come into effect in early 2021.*
  - Based on the Land Use Capability classification system (Policy 1 – Appendix A).
  - Avoid fragmentation and maintain the productive capacity of highly productive land (Policy 4 (a) and (c)).
  - Use of a Suitably qualified person to identify high class soil for resource consent applications (Policy 7 (e)).

## General Subdivision/Prohibited Subdivision

### Paragraph 34 (page 5)

- *While 40ha appears to be large step from 20ha, it has a significant positive effect in terms of retaining larger areas of high class soils, which Dr Hill will discuss. Further, as Mr Fairgray and Professor Scrimgeour will discuss, the loss of land from primary production is significantly reduced ensuring the economic impacts are minimised.*

The main considerations are that of the loss of high class soil and land fragmentation are avoided. Both the loss of high class soil (area in hectares) and the number of titles impacted are both important to consider.

An assessment of the number of titles affected and the area potentially lost from production to a child lot for Pre and Post 6<sup>th</sup> December 1997 for 20 ha and 40 ha minimum title sizes are summarised

in **Table 7<sup>6</sup>** and **Table 8<sup>7</sup>** respectively.

**Table 7. The number of titles impacted for Pre and Post 6<sup>th</sup>December 1997 for 20 ha, 30 ha and 40 ha minimum title sizes.**

Minimum Parent title size	Estimated number of eligible parent titles for subdivision*		
	Pre 6 <sup>th</sup> December 1997	Post 6 <sup>th</sup> December 1997	Combined
20 ha	2001	1628	3629
30 ha	1501	1282	2783
40 ha	1180	1047	2227

\*data excludes titles with no date

Removing this date restriction would increase the number of titles that are eligible for subdivision, potentially increasing the likelihood of land fragmentation in the rural zone with greater potential to impact on high class soils.

For a minimum parent title size of 20 ha this increase would equate to an additional 1628 titles (+81%), and for a minimum parent title size of 40 ha this increase would equate to an additional 1047 titles (+89%).

Retaining the proposed date restriction of 6<sup>th</sup> December 1997 and increasing the minimum parent title size from 20 ha to 40 ha would reduce the number of eligible titles for subdivision from 2001 to 1180, a decrease of 821 titles (-41%).

The area affected by the creation of the child lots (irrespective of high class soils) for the different combinations of Parent title size and date are shown for child lot sizes of 0.8 ha and 1.6 ha (**Table 8**).

**Table 8. Area of land lost to child lots (irrespective of high class soils) for different combinations of Parent title size and date.**

Minimum Parent title size	Child lot size	Area of land lost to child lots (ha)*		
		Pre 6 <sup>th</sup> December 1997	Post 6 <sup>th</sup> December 1997	Combined
20 ha	0.8 ha	1601	1302	2903
	1.6 ha	3202	2605	5806
30 ha	0.8 ha	1201	1026	2226
	1.6 ha	2402	2051	4453
40 ha	0.8 ha	944	838	1782
	1.6 ha	1888	1675	3563

\*data excludes titles with no date

Removing the date restriction would potentially increase the loss of land from production through the creation of child lots (irrespective of whether they are high class soils or not) from 944 - 3202 ha

<sup>6</sup> Table 7, page 45: Hill, R.B. (2020). A review of high class soils in the Waikato District. Report for Waikato District Council. Waikato District Council. Ngaruawahia.

<sup>7</sup> Table 8, page 46: Hill, R.B. (2020). A review of high class soils in the Waikato District. Report for Waikato District Council. Waikato District Council. Ngaruawahia.

to 1782 - 5806 ha depending on the eventual child lot size and the minimum parent title size.

**Paragraph 38 (page 6)**

- *The notified version of the plan included a rule requiring 80% of high class soils to be contained in one lot and 20% to be contained in the other. Dr Hill has assisted me in determining which option would be the most practical solution to ensure subdivision can occur with some allowances with a small area of the proposed lot being located on high class soils. The 15% threshold is a compromise between 10% sought by the Waikato Regional Council and the 20% as stipulated in the proposed rule. Dr Hill will discuss this in further detail shortly.*

The concept of applying a % threshold for the area of high class soil in a title or a lot is not commonly used. The proposed NPS-HPL applies a threshold of 50% or more coverage of LUC 1-3 to determine if a land parcel is highly productive land<sup>8</sup>.

Overall, there is minimal difference in the number of parent titles affected by changing the lot size or the % threshold (**Table 13**<sup>9</sup>).

Note that for a title to be eligible it must have a at least enough non high class soil for a child lot of the given size to meet the high class soil area % threshold. For example, for a child lot size of 0.5 ha and a 10% threshold the minimum area of non high class soil required is 0.45 ha (0.9 x 0.5 ha).

**Table 13. The number of eligible titles with high class soils associated with each of the lot size/% threshold combinations.**

Child lot size (ha)	High class soil area threshold (% of child lot area)			
	10%	15%	20%	30%
0.5	1141	1141	1141	1142
0.8	1139	1139	1139	1140
1.6	1137	1137	1137	1137
2.0	1137	1137	1137	1137

The analysis indicates that applying a high class soil area % threshold reduces the direct loss of high class soils resulting from the creation of a child lot. This reduction increases as the % threshold is reduced, and child lot size is reduced (**Table 14**<sup>10</sup>).

**Table 14. The estimated loss of high class soils associated with each of the lot size/% threshold combinations.**

Child lot size (ha)	High class soil area threshold (% of child lot area)			
	10%	15%	20%	30%
0.5	57	86	114	171
0.8	91	137	182	274

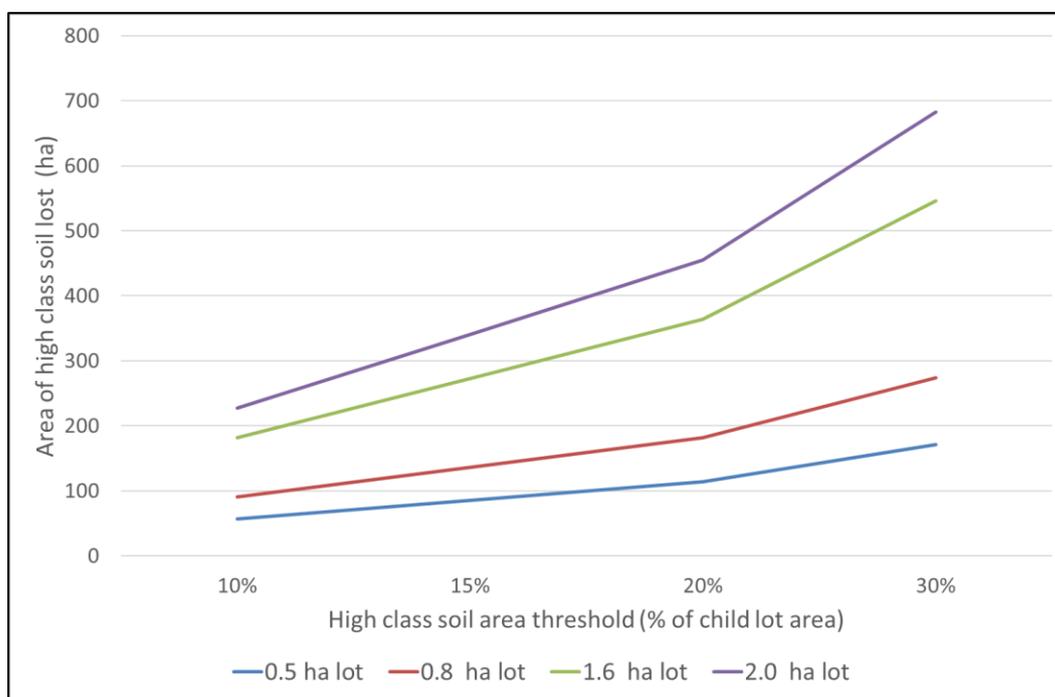
<sup>8</sup> Proposed National Policy Statement – Highly Productive Land. Indicative Cost-Benefit Analysis MPI Technical Paper No: 2019/10.

<sup>9</sup> Table 13, page 50: Hill, R.B. (2020). A review of high class soils in the Waikato District. Report for Waikato District Council. Waikato District Council. Ngaruawahia.

<sup>10</sup> Table 14, page 50: Hill, R.B. (2020). A review of high class soils in the Waikato District. Report for Waikato District Council. Waikato District Council. Ngaruawahia.

1.6	182	273	364	546
2.0	227	341	455	682

**Figure 16<sup>11</sup>** graphically presents the data from **Table 14** showing the estimated loss of high class soils associated with each of the lot size/% threshold combinations.



**Figure 16. The relative loss of high class soils associated with each of the lot size/% threshold combinations, using a 40 ha minimum parent title size.**

The smallest direct loss of high class soils from the creation of a child lot is likely to be achieved using a smaller lot size in combination with a lower high class soils area threshold.

Implementing a high class soil area % threshold would require the accurate identification and mapping of high class soils at property scale.

The use of a % threshold value may be problematic (from an implementation sense) given the nature of field soil mapping, and the use of an exact value to determine the eligibility of a child lot. For example, field mapping could be manipulated (even at the finer scale) to produce a value of 19%, which would deem the child lot eligible. For a child lot of 1.6 ha every 1% equates to 160 m<sup>2</sup>. Using soil map scale guidelines<sup>12</sup>, delineation of 160 m<sup>2</sup> area would suggest a mapping scale of less than 1:1000.

However, the main emphasis of the rationale for the approach should be that the % threshold does provide at least some certainty that the child lot is predominantly not high class soils.

For the Waikato region (including the Waikato district) the presence or absence of high class soils (as defined using the LUC Classification) generally depends on the values for LUC erodibility (e) wetness (w) limitations, in combination with the presence or absence of Organic Soils and Allophanic Soils as defined by the New Zealand Soil Classification. This means that in reality most soils that are not high

<sup>11</sup> Figure 16, page 52: Hill, R.B. (2020). A review of high class soils in the Waikato District. Report for Waikato District Council. Waikato District Council. Ngaruawahia.

<sup>12</sup> Grealish G. (2017) New Zealand soil mapping protocols and guidelines. Envirolink Grant: C09X1606. Landcare Research, Palmerston North.

class soils are on land that has a slope of >7 ° (or >15 ° if on Allophanic Soils), has moderate or greater erosion susceptibility or is poorly or very poorly drained.

These limitations mean that the land is generally not that amicable to providing a flat or well drained platform for building. Also, placement of a building platform (and accessways) on steeper topography potentially increases the potential for erosion and sediment loss from the site. Furthermore, in my experience mapping at property scale it is common to have small areas of high class soils. These generally occur in localised areas where slopes are ≤7 °.

Placement of a child lot to contain no high class soils is likely to be either impossible or require that its placement is either on sloping (> 7 ° slopes, or >15 ° if on Allophanic Soils) or on very poorly drained soils or soils prone to erosion. In my opinion allowing some high class soil within a child lot is justifiable to ensure some land is available for a building platform.

An acceptable % threshold is considered 15%, as this minimises the direct loss of high class soils through the creation of the child lot, allows some area for productive use or a safe building platform, and minimises the need for earthworks on the site that may increase the potential for erosion and ongoing sediment loss.

## Rural Hamlet Subdivision

### Paragraph 52 (page 8)

- Further, I have also recommended a new provision be included to ensure the titles do not locate on high class soils, which the notified rule did not prevent. As you will read from my rebuttal evidence, Dr Hill and I have done some additional work on this particular rule to ensure consistency with the other rules controlling the location of lots on high class soils. As he will discuss, we determined that requiring individual lots to meet the 15% threshold requirement was a less restrictive provision than the rule I had initially recommended in my S42A report. Additionally, Dr Hill determined that this was the best option as opposed to allowing a combined total for all lots, which could lead to some inappropriate outcomes where in some scenarios it may mean that an individual lot could be located fully on high class soils.*

Detailed analysis and discussion on the titles involved and the application of a 15 % threshold for high class soils is presented in my Technical memo. I will summarise the main points from the memo.

### Number of titles

However, unlike the proposed rule 22.4.1.2 for general subdivision which has restrictions on the number of eligible titles (includes only titles before 6<sup>th</sup> December 1997, and greater than 40 ha), the number of eligible titles for Rule 22.4.1.5 Rural Hamlet Subdivision potentially includes all titles, that could be combined to form the new lots and provide a balance of 40ha. For comparison, the number of eligible titles for rules 22.4.1.2 General subdivision and 22.4.1.5 Rural Hamlet Subdivision is shown in **Table 1**<sup>13</sup>. The title number estimates were provided by Waikato District Council GIS staff.

**Table 1. The number of eligible titles for each rule.**

Rule	Number of eligible Rural Titles (approximate %)				
	Total	Fully high class soil	Partially high class	No high class soil	Eligible title

<sup>13</sup> Table 1, page 3 – Technical Memo: The Proposed Waikato District Plan – Stage 1, Hearing 18 Rural Topic; high class soil technical information for S42A rebuttal evidence.

			soil		total
22.4.1.2 General subdivision Assumes 6 <sup>th</sup> December 1997 date restriction and 20 ha minimum parent title size*	2001	70 (4%)	766 (38%)	1165 (58%)	1931 (excludes fully high class soil titles)
22.4.1.2 General subdivision Assumes 6 <sup>th</sup> December 1997 date restriction and 40 ha minimum parent title size*	1180	23 (2%)	435 (37%)	722 (61%)	1157 (excludes fully high class soil titles)
22.4.1.5 Rural Hamlet Subdivision <sup>#</sup>	16,656	2056 (12%)	6012 (36%)	8588 (51%)	16,656 (includes fully high class soil titles)

\*Excludes titles with no date; # excludes 23 titles with gross area of 0 ha.

**The results of Table 1 above are summarised as follows:**

1. The number of eligible titles for the 22.4.1.5 Rural Hamlet Subdivision rule is much greater than the number of eligible titles for the 22.4.1.2 General subdivision rule.
2. For the 22.4.1.5 rural hamlet subdivision rule all titles remain eligible irrespective of whether they have high class soil or not. This is because the composition of the rural titles for the hamlet subdivision could include titles with and without high class soil, and so fully high class soil titles could be included.

**Use of a high class soil 15% threshold and presence of a dwelling/curtilage**

Submitters have raised concerns in respect to creating rural hamlet lots around existing dwelling and curtilage areas located on high class soils and have commented that this would appear to be unreasonable particularly where a landowner wants to create a rural hamlet around an existing dwelling.

I have estimated the relative loss of high class soil for this in my technical memo and refer to Table 2 and associated text in that memo.

**Table 2<sup>14</sup>** below uses combinations of minimum and maximum lot sizes (0.8 and 1.6 ha) and shows the total loss of high class soil for the different hamlet placement scenarios:

- applying a 15% high class soil threshold to individual lots and the combined lot area.
- the placement of lots on rural titles with 100% high class soil, with and without a dwelling and curtilage of 2000 m<sup>2</sup>.

**Table 2. The total loss of high class soil for different hamlet placement the scenarios.**

Hamlet lot size combinations (excludes balance lot)	Total lot area (ha)	Loss of high class soil (ha)			
		Using a 15% high class soil threshold		Located on 100% high class soil	
		Applied to individual lot areas	Applied to combined lot areas	With dwelling and curtilage of 2000 m <sup>2</sup>	With no dwelling and curtilage

<sup>14</sup> Table 2, page 4 – Technical Memo: The Proposed Waikato District Plan – Stage 1, Hearing 18 Rural Topic; high class soil technical information for S42A rebuttal evidence.

4 lots of 1.6 ha size.	6.4	0.96	0.96	6.2	6.4
3 lots of 1.6 ha and 1 lot of 0.8 ha.	5.6	<b>0.84</b>	0.84	5.4	5.6
2 lots of 1.6 ha and 2 lots of 0.8 ha.	4.8	0.72	0.72	4.6	4.8
1 lot of 1.6 ha and 3 lots of 0.8 ha.	4.0	0.6	0.6	3.8	4.0
4 lots of 0.8 ha size.	3.2	0.48	0.48	3.0	3.2

**The results of Table 2 above are summarised as follows:**

1. The application of the 15% threshold resulted in the least loss of high class soil (0.48 – 0.96 ha compared with 3.2 – 6.4 ha if on 100% high class soil).
2. The application of the 15% threshold to the individual lots in a hamlet or to the combined hamlet lot area has no net effect on the loss of high class soil.
3. Applying the 15% threshold across the combined lots in the hamlet could result in one lot being 100% high class soil.
4. The presence or absence of a dwelling when a lot is on 100% high class soil is likely to have minimal impact on reducing the loss of high class soil.

Another implication of applying the 15% across the combined lots in the hamlet, could be that large areas of high class soil could be preferentially sought (as in general they provide a better building platform). This could result in the greater loss of high class soil.

This situation could arise if the combined titles are predominantly not high class soil and there is one area that is predominantly high class soil. I have attempted to illustrate this in **Figure 1**<sup>15</sup>. For the example, I have used four rural titles (three with no high class soil and one with partial high class soil) combined to create four new lots. Note that **Figure 1** is illustrative only and is not drawn to scale.

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<sup>15</sup> Figure 1, page 6 – Technical Memo: The Proposed Waikato District Plan – Stage 1, Hearing 18 Rural Topic; high class soil technical information for S42A rebuttal evidence.

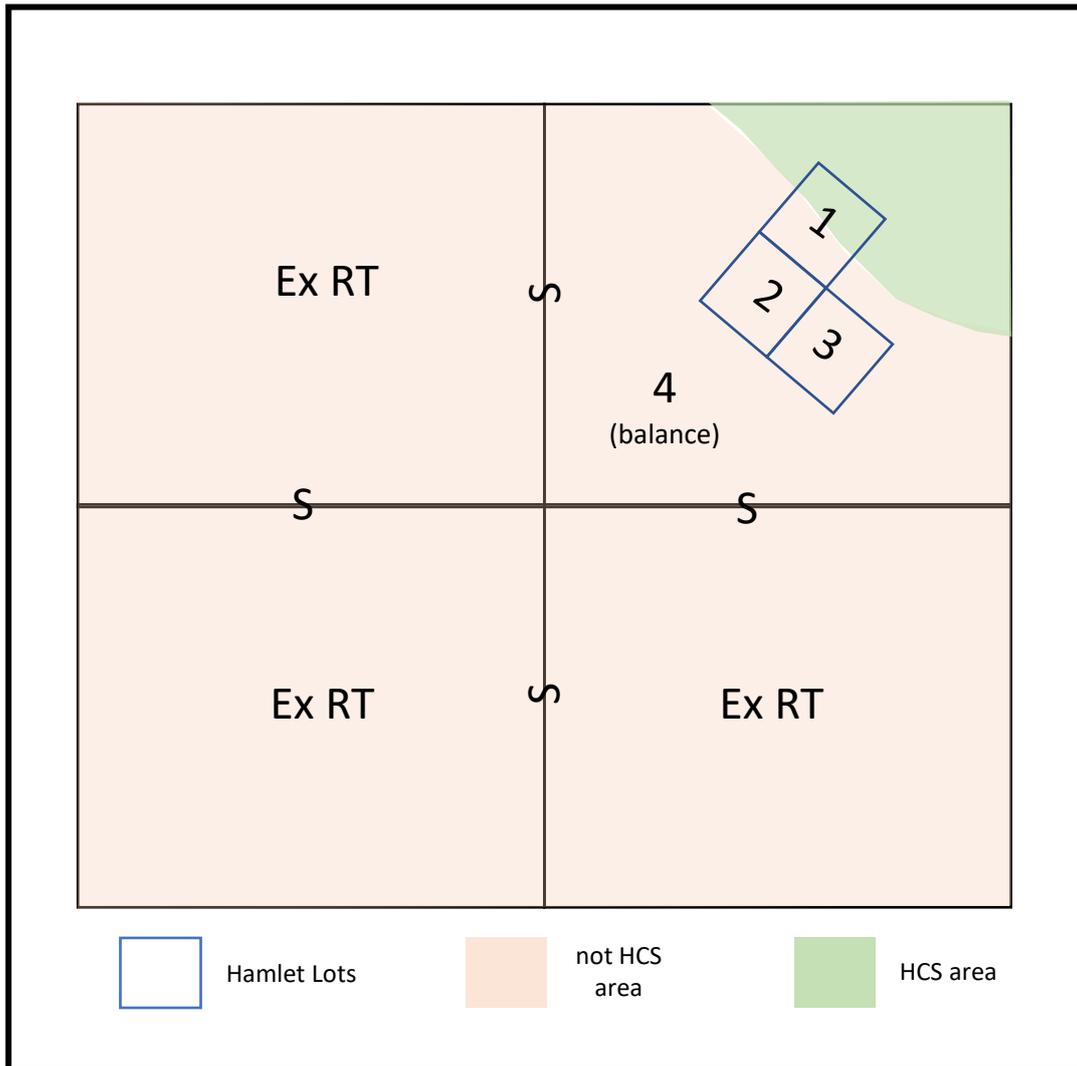


Figure 1. Illustration of preferential placement of new lots on high class soil where rural tiles are predominantly not high class soil.

For the scenario presented in **Figure 1**, Lot 1 individually contains >15% high class soil (i.e. 15 % of the high class soil for the combined lots). The lots are also positioned in a way that restricts the use of the area of high class soil remaining in the balance lot.

In my opinion applying the 15% across the combined lots in the hamlet could potentially result in additional losses of high class soil and go against the intent of avoiding or minimising the loss of high class soil we are seeking, which is also recognised in the Waikato Regional Policy Statement<sup>16</sup> and the proposed National Policy Statement for Highly Productive land (NPS-HPL)<sup>17</sup>.

To provide consistency with the other subdivision rules (22.4.1.2 and 22.4.1.6) and align with the WRPS and the proposed NPS-HPL the best option for addressing the loss of high class soil in Rule 22.4.1.5 rural hamlet subdivision is to use the 15% high class soil area threshold (as in the 22.4.1.2 General Subdivision rule) and apply it to individual lots within each hamlet.

<sup>16</sup> Waikato Regional Council (2018) Waikato Regional Policy Statement: Te Tauākī Kaupapahere Te-Rohe O Waikato. Waikato Regional Council, Hamilton.

<sup>17</sup> Ministry for Primary Industries (2019). VALUING HIGHLY PRODUCTIVE LAND: Discussion document. Ministry for Primary Industries, Wellington.

### Paragraph 53 (page 8)

- *One of these scenarios raised by submitters is where an existing dwelling is already located on high class soils and an applicant is wanting to cluster titles around the existing dwelling. As Dr Hill will highlight, areas with existing dwellings and curtilage areas are often assessed as being modified soils and therefore no longer considered to be considered high class soils. However despite this, Dr Hill was concerned that using the existing dwelling to locate a rural hamlet around is not always the best option where high class soils exist and in some cases, it may be a better option to locate the hamlet away from the existing dwelling to avoid further loss of high class soils.*

A property scale site specific Land Use Capability Assessment Classification assessment assesses land in its current condition and includes any areas of modified soil or areas that would be excluded from productive use.

Some permanent changes to the land (e.g. the placement of tracks, excavation for buildings, excavation of drains and soil remediation for soil contamination) irreversibly change the soil and land. These areas are defined as modified soils. To the best of my knowledge there is no definitive guidance published on the application of modified soil areas. The best guidance is based on the definition provided by the New Zealand Soil Classification definition for Anthropogenic Soils<sup>18</sup>.

In practice I have adopted this as a guide for identifying modified soils for property scale soil and LUC Classification assessments.

This usually means that existing dwellings and often the curtilage are excluded from the productive area on the basis that their presence will likely mean that the area of soil has been modified or removed simply because there is a building present.

Curtilage areas have usually been recontoured, have garden paths etc. Larger curtilage areas may not be modified; therefore, curtilage areas should be assessed at a property scale to confirm that they are modified soil.

Other modified areas can be included, such as: excavated drains, tracks, other buildings, earthworks, and some areas where large trees have been removed and the area has been disturbed to depth. The implications are that if an existing dwelling is located in high class soil then the area is no longer considered high class soil it is mapped as modified soil and classified as not being high class soil.

It is possible with the rural hamlet rule that it may be desirable to position a hamlet in order to utilise an existing dwelling.

Historical placement of dwellings is likely to have been irrespective of whether the soil was high class soil – i.e. dwellings are present on high class soil and may be surrounded by high class soil. In this situation justifying the placement of a hamlet on high class soil surrounding a dwelling is in my opinion to be avoided and the presence of the dwelling does not provide justification for the loss of the surrounding high class soil. In my opinion retaining the high class soil % threshold should still apply.

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<sup>18</sup> Anthropogenic soils – “Other soils that have been formed by the direct action of people by either truncation, drastic mixing or by deposition of material 30 cm or more thick” in Hewitt AE. (2010) New Zealand Soil Classification. 3rd ed. Landcare Research Science Series No. 1. Lincoln, Manaaki Whenua Press.

## Boundary Relocation Subdivision – Rule 22.4.1.4

### Paragraph 57 (page 9)

- *Additionally, Dr Hill and I also worked through a rule restricting proposed lots from locating on high class soils. However, this rule is not the same as the rule recommended for the rural hamlet, as the resulting titles only need to be 8,000m<sup>2</sup> minimum area, which means that resulting lots are not always going to be rural-residential in size. As Dr Hill will discuss, we determined that new title areas less than 4ha in area would trigger the rule, because titles less than this size were typically rural residential in size and use. Generally, lots 4ha and above can support a wider range of primary productive activities. 4ha is also the title size used in the draft National Policy Statement for Highly Productive Land.*

Given the variable sizes of records of title across the district and boundary relocation permutations that are possible under this rule applying a 15% threshold (as used for rules 22.4.1.2, 22.4.1.5 and 22.4.1.6) using a rule similar to the rural hamlet subdivision rule, as discussed above is unlikely to be a practical option. For example, if two Rural Titles were 40 ha each and wanting to undertake a boundary relocation to become a 20 ha and 60 ha title configuration, identifying high class soil on these titles would require a property scale soil and LUC Classification assessment for the entire area, which is neither practical nor necessary given the sizes of these existing titles.

In my Technical Report for the S42A<sup>19</sup>, I have identified that titles below 4 ha are less viable for a range of productive land uses (10.1.3, page 41) and the proposed NPS-HPL<sup>20</sup> cited a study in 2012 which reported that up to 66 percent of properties that were less than 4 hectares and up to 82 percent of those less than 1.5 hectares, were not being used for any productive purpose<sup>21</sup>.

**Figure 15<sup>22</sup>** conceptually depicts land uses against the estimated minimum land area required for viable use of that area for the land use and assuming the land is capable of supporting the land use.

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<sup>19</sup> Hill, R.B. (2020). A review of high class soils in the Waikato District. Report for Waikato District Council. Waikato District Council. Ngaruawahia.

<sup>20</sup> Ministry for Primary Industries (2019). VALUING HIGHLY PRODUCTIVE LAND: Discussion document. Ministry for Primary Industries, Wellington.

<sup>21</sup> VALUING HIGHLY PRODUCTIVE LAND: Discussion document, page 17 – citing: Andrew R, Dymond JR. (2012). Expansion of lifestyle blocks and urban areas onto high-class land: An update for planning and policy, Journal of the Royal Society of New Zealand.

<sup>22</sup> Figure 15, page 43: Hill, R.B. (2020). A review of high class soils in the Waikato District. Report for Waikato District Council. Waikato District Council. Ngaruawahia.

General land use (e.g.)	<2 ha	2-4 ha	4-20 ha	20-40 ha	40-75 ha	75- 200 ha	200+ ha
Very Intensive horticulture (flowers)							
Intensive horticulture (orchards)							
Cropping (commercial vegetables)							
Cropping (maize)							
Intensive pasture "dairy"							
Intensive pasture "other"							
Low intensity pastoral							
Production forestry							

**Figure 15. Estimated land area required for a range of land uses (green- indicates a viable land use).**

A practical approach could be based on identifying high class soil where the rural titles involved in the boundary relocation are  $\leq 4.0$  ha in area, or when titles resulting from the boundary relocation are  $\leq 4.0$  ha in area. This approach would provide the necessary information to direct resulting titles away from high class soil, therefore, minimising the loss of high class soil associated with the rule.

### Rules restricting lots resulting from boundary relocations, rural hamlet and conservation lot subdivision from locating on high class soil

#### Paragraph 71 (page 11)

- *As discussed previously, Dr Hill and I have been working to ensure the rules relating to the protection of high class soils in each provision appropriately manage lots locating on high class soils. The rules focus on ensuring that individual lots, with the exception of the balance lot, are not located on more than 15% of high class soils. This is consistent with the recommended approach for general subdivision.*

The main point I want to highlight here is one of consistency across rules relating to the provision of high class soil.

A consistent approach to minimising the loss of high class soil across all rules where there is potential for loss should be sought. This provides equity across rules and prevents a rule, such as the boundary

relocation rule that is more permissive being used to an advantage with respect to high class soils. Such a situation could unintentionally result in the greater loss of high class soil in the Rural zone.

Another point is that the cumulative loss of high class soil across all rules needs to be minimised, and to do so, rules need to work individually as well as collectively.

I discuss this importance in my S42A Supporting Technical Report (Section 11.3, page 52).

A final point is that a consistent approach to minimising the loss of high class soil across all rules should increase the ease of implementation of the rules, especially for those where multiple subdivision rules may apply. The same applies to the suitability qualified person undertaking the assessment, as there may be situations where multiple rules apply to a single property with multiple titles.

It is further noted that a similar approach to the conservation lot subdivision rule in 22.4.1.6 has also been identified as needing to be consistent with the rural hamlet rule, given the possibility of multiple new lots being created. If a similar approach is taken to the rural hamlet rule this ensures individual lots are calculated, as opposed to a combined total area.

Applying (where possible) a consistent approach has benefits, for the developer, the suitably qualified person doing the assessment and for the retaining high class soil in production.

For the developer, having consistent provisions for high class soils means that a title where multiple rules can apply are consistent and do not create the complexities in subdivision applications.

For the assessor, a property can be assessed based on the high class soil identified, thresholds applied to the whole property, irrespective of individual rules. In practical terms, this is less onerous and avoids additional assessment or calculations that would be required if provisions differed across rules, or if the developer changed the location or type of subdivision.

For high class soil, there is consistent certainty around the amount of high class soil that will be affected across all rules. This means that one rule cannot be preferentially targeted for subdivision, resulting in a greater loss of high class soil.