



NUTRIENT NEUTRAL ASSESSMENT & MITIGATION STRATEGY

Report Ref: NNAMS/401

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401/NNAMS/A2 Nutrient calculations

1 Introduction

Nutrient Neutral Ltd has been commissioned by Hume Planning Consultancy Ltd to undertake a Nutrient Neutrality and Mitigation Strategy (NNAMS) for the proposed development of four residential dwellings together with access, parking, and landscaping at land rear of Barnstormers, Stone Street, Stanford, Kent, TN25 6DF.

A previous planning application for this development was submitted to Folkestone & Hythe District Council (Planning ref: 21/1142/FH) and a subsequent appeal dismissed on 31st August 2023, one such justification for this dismissal being the potential adverse impacts of the proposed development to the Stodmarsh SAC Conservation Objectives. This report supports a revised planning application (Planning ref: 23/1925/FH), which is currently under consideration by the Local Planning Authority (LPA).

The conservation status of the Stodmarsh is currently 'unfavourable' because it is suffering from eutrophication due to excessive nitrogen and phosphorus levels in water draining into the lakes from the River Stour. Wastewater from the proposed development would drain to the Sellindge Wastewater Treatment Works (STW), which discharges to the River Stour.

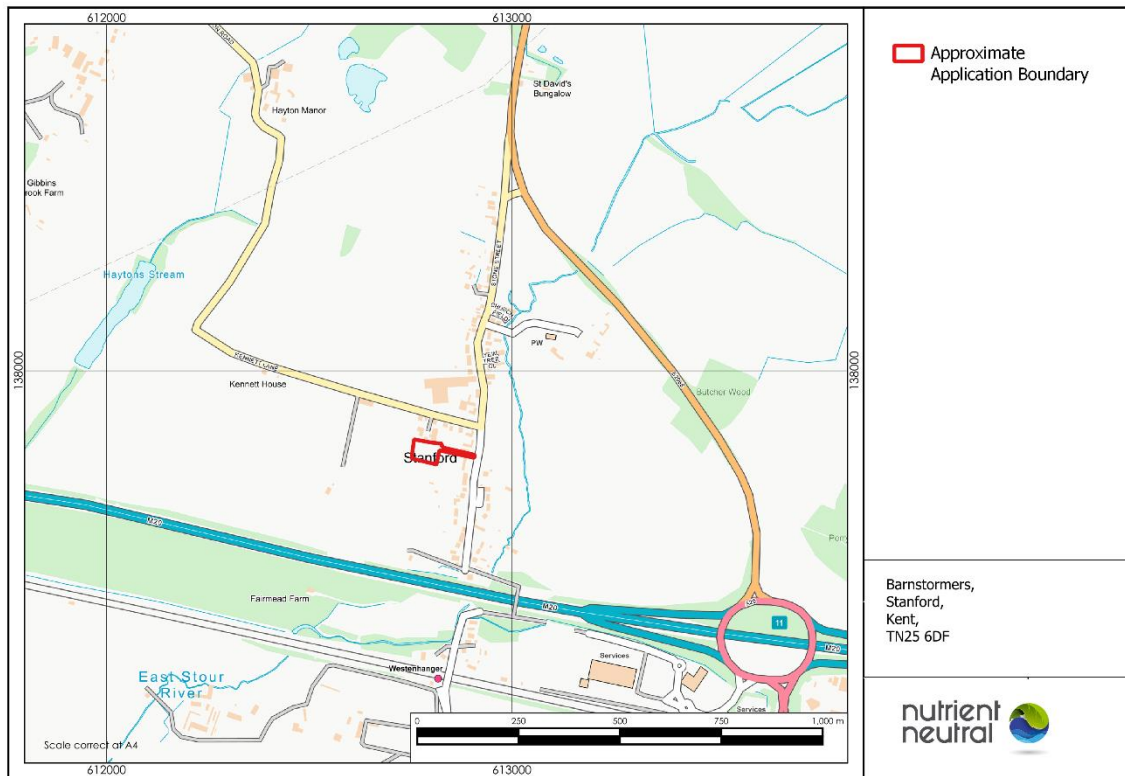
The phosphorus and nitrogen load generated by the proposed development has been calculated according to the Natural England Nutrient Neutrality Budget Calculator for the Stodmarsh SAC and Ramsar (V3).

1.1 Site characteristics

1.1.1 Site location

The proposed development site is located within the village of Stanford, on a 0.40ha parcel of land to the rear of the Barnstormers property, which is currently used as an extended garden. The red line application boundary includes an access trackway adjoining Stone Street on the eastern boundary. The site is centred around National Grid Reference (NGR) TR 12816 37799.

Drawing 401/NNAMS/D1: Site location



1.1.2 Topography

The site is located within undulating lowland terrain, with the proposed development site averaging 76m Above Ordnance Datum (m AOD). The local topography of the surrounding areas decreases eastwards to the channel of the East Stour River, approximately 125m east of the red line application boundary for the proposed development.

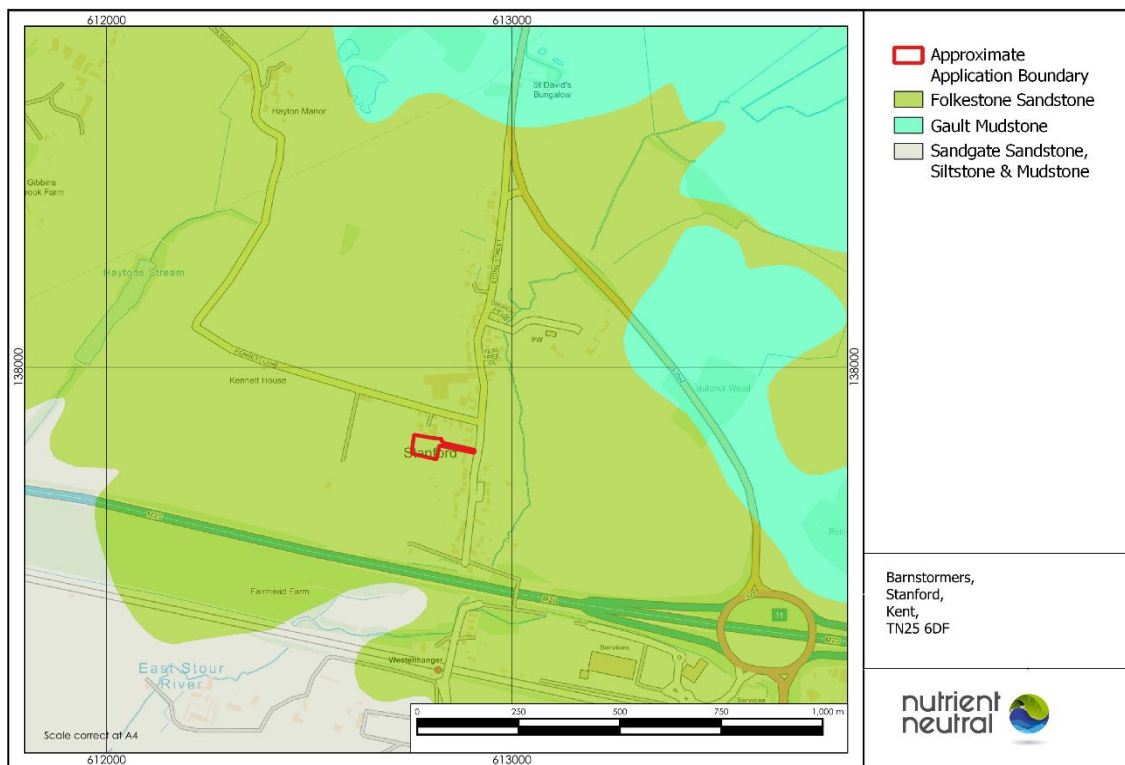
1.1.3 Geology & Hydrogeology

The bedrock geology at the proposed site is uniform and comprises Folkestone Formation (sandstone) (401/NNAMS/D2). Superficial deposits comprise Head (clay and silt) in the immediate site area (401/NNAMS/D3).

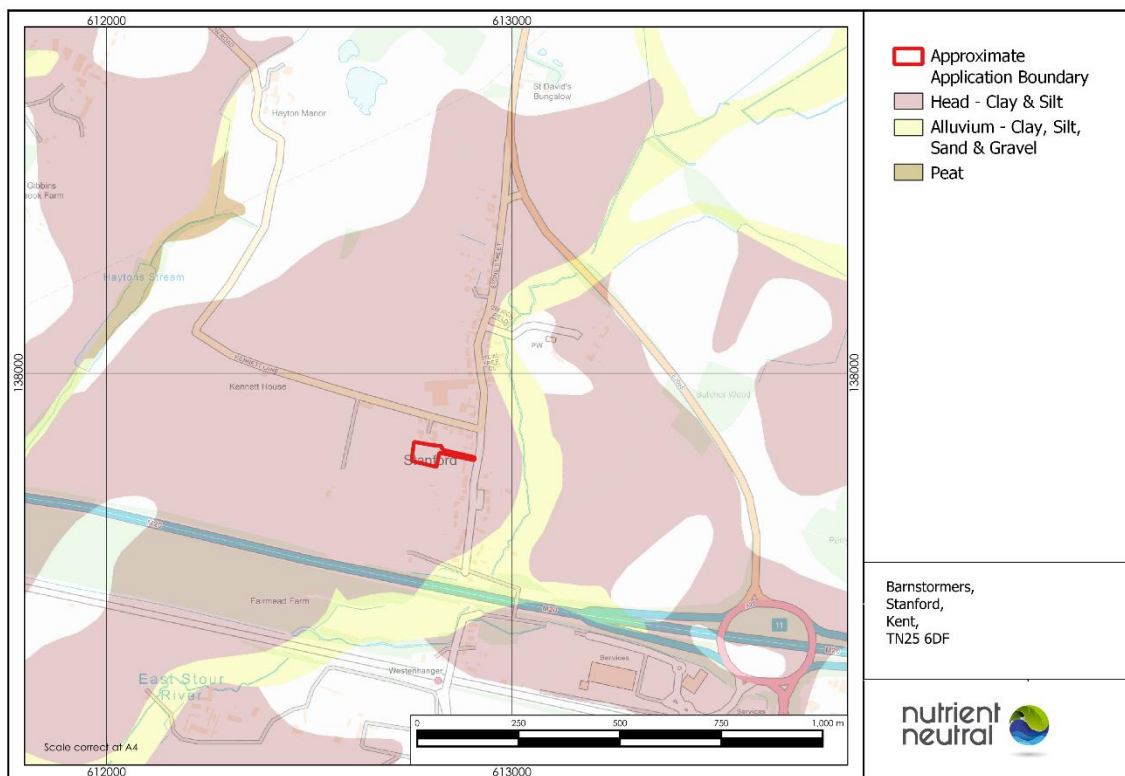
The underlying geology in the area is classified as having 'Medium - High' groundwater vulnerability (MAGIC DEFRA).

The site is located within a Nitrate Vulnerable Zone (NVZ) 2017 Designation for surface water (River Great Stour). (MAGIC DEFRA).

Drawing 401/NNAMS/D2: Bedrock geology



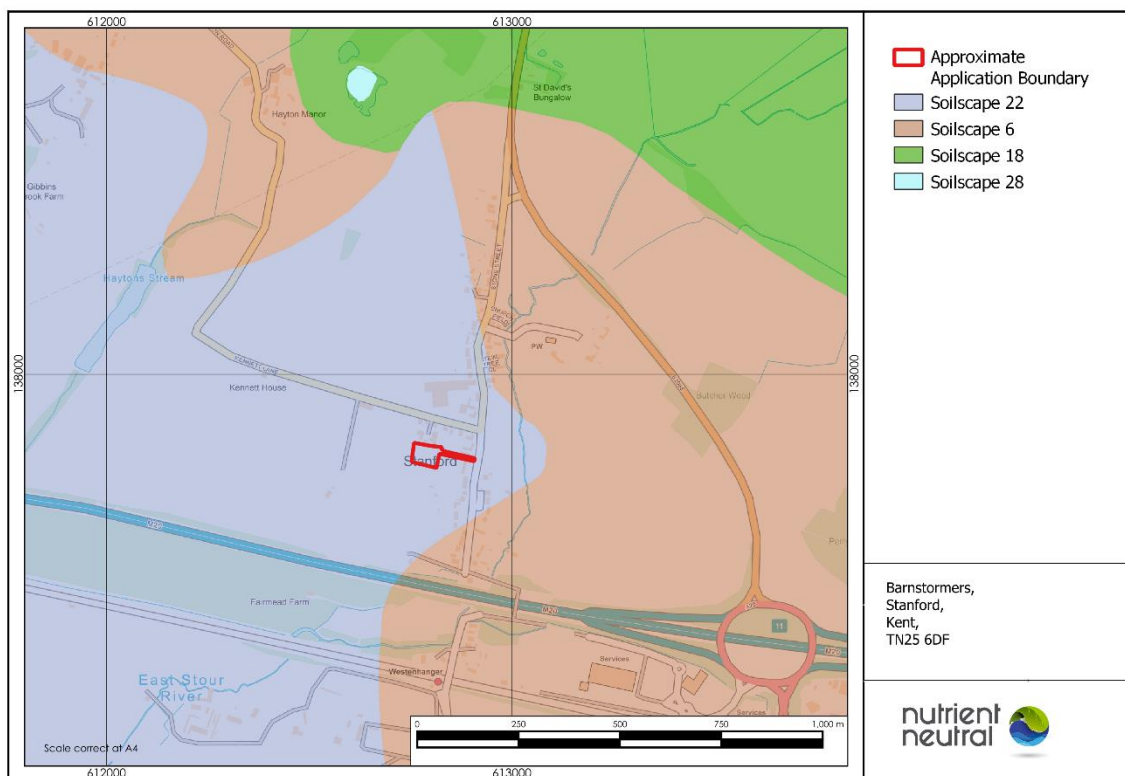
Drawing 401/NNAMS/D3: Superficial deposits



1.1.4 Soils

Based on the Cranfield University Soilscape webtool (<http://www.landis.org.uk/soilscape>), the soils under the site are uniform and comprise Soilscape 22 which are loamy soils with naturally high groundwater. This type of soil mostly drains into shallow groundwater and marginal field ditches; thus the local water resources are vulnerable to pollution from nutrients, pesticides and wastes applied to the land.

Drawing 401/NNAMS/D4: Soils at the site



1.1.5 Hydrology

The proposed development site is located within the Stour Upper Operational Catchment, which forms part of the Stour Management Catchment. The nearest watercourse is the East Stour River, approximately 125m east of the red line application boundary adjoining Stone Street. The East Stour flows southwards for approximately 600m, then flows broadly north-westwards, to its confluence with the Great Stour at Ashford, 12.5km northwest of the site NGR TR 01601 42850.

1.1.6 Rainfall

The 1961-1990 annual rainfall was sourced from the National River Flow Archive, using the nearest catchment water monitoring station (40023 - East Stour at South Willesborough); indicated to be in the range of 750-800mm/yr (<https://nrfa.ceh.ac.uk/data/search>).

2 Calculation of nutrient export from proposed development

Phosphorus and nitrogen calculations have been undertaken in accordance with the Stodmarsh SAC and Ramsar nutrient budget calculator V3 (Natural England). Full calculation sheets are attached (**Appendix 2**), and the pertinent information summarised below.

2.1 Proposed development

The proposed development comprises the erection of four residential dwellings. An average occupancy rate of 2.4 persons per residential dwelling has been used for this calculation, and a daily water usage (litres per person per day) of 120 l/p/d has been utilised in accordance with prescribed values in the Stodmarsh SAC and Ramsar nutrient budget calculator V3 (Natural England). Thus, this development will increase the local population by 9.6 persons: in total generating an additional 1,152 litres per day.

2.2 Calculation of wastewater load

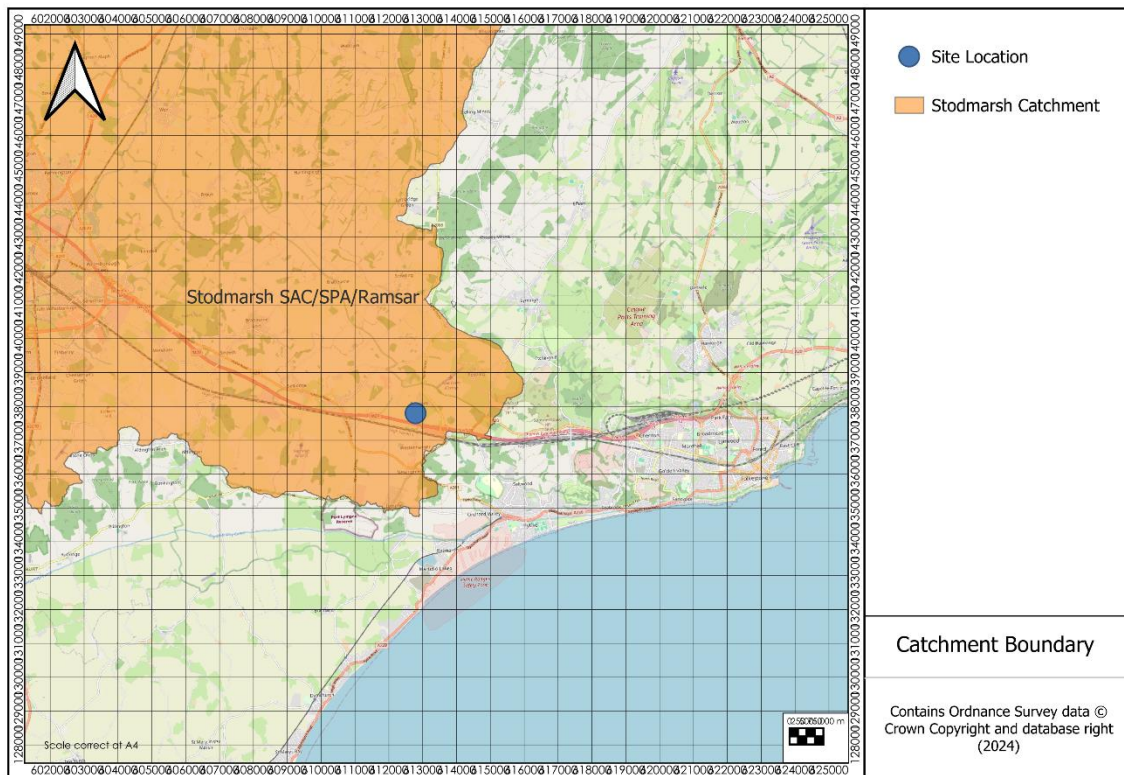
The development site is located within a sewered area, served by Sellindge Wastewater Treatment Works (WWT). At the time of this report, Sellindge WWT has a phosphorus discharge limit of 1mg TP/litre, and a nitrogen discharge limit of 27mg TN/litre. The Post 2030 discharge at the Sellindge WWT has a phosphorus discharge limit of 0.25mg TP/litre, and a nitrogen discharge limit of 10mg TN/litre.

However, in order to achieve neutrality it is proposed to treat wastewater on site via a package treatment plant, collect and store all effluent and tanker this off-site to be discharged out of the Stodmarsh catchment.

It is acknowledged that the site is located within a sewered area and that private wastewater treatment and discharge would not normally be permitted. However, the proposed strategy became viable following consultation with a case officer from Folkestone and Hythe District Council. The case officer highlighted a recently approved scheme (Ref 21/1419/FH), which utilised this strategy as a means of enabling developments to pass through until such a time where credits are made widely available and subsequent discharge within the Stodmarsh

catchment becomes feasible again. A significant piece of justification for the feasibility of this proposed strategy comes from the site's close proximity to the Stodmarsh catchment boundary (401/NNAMS/D5).

Drawing 401/NNAMS/D5: Stodmarsh Catchment Boundary



Therefore, it is proposed to install an onsite storage tank and transfer wastewater outside of the sensitive catchment area. Therefore, for the purposes of nutrient budget calculation the effective nutrient export associated with wastewater from this proposed development is 0 kgs.

2.3 Land use change

2.3.1 Pre-Development

The 0.40ha parcel of land is best described as residential curtilage, and therefore technically classified as residential land. Stage 2 of the Stodmarsh SAC and Ramsar nutrient budget calculator has been utilised to assess the pre-development phosphorus and nitrogen export associated with 0.40ha of residential land; calculated to be **0.62kg TP/yr** and **5.78kg TN/yr**.

2.3.1 Post-Development

Stage 3 of the Stodmarsh SAC and Ramsar nutrient budget calculator has been utilised to assess the post-development phosphorus and nitrogen export associated with the 0.40ha

parcel of land, which will continue to be used as residential land. This has an associated nutrient export of **0.62 kg TP/yr** and **5.78kg TN/yr**. As the land use will not change, there is no change in nutrient export from the site.

3 Summary of phosphorus balance for this development

<i>401/NNAMS/T1: Nutrient budget</i>		
Description	Phosphorus Value (kg TP/yr)	Nitrogen Value (kg TN/yr)
Wastewater, post-treatment	0	0
Pre-development land use	0.62	5.78
Post-development site loss	0.62	5.78
Land use net change	0	0
Nutrient budget	0.00	0.00
20% buffer	0.00	0.00
Nutrient budget + 20% buffer	0.00	0.00

It is therefore concluded that there will not be an additional nutrient export to the Stodmarsh SAC/ Ramsar catchment as a result of the proposed development, which is effectively nutrient neutral.

4 Legally securing proposed solution

The proposed wastewater management, as detailed above, will be secured through a unilateral undertaking or s106 with Folkestone and Hythe Council. Records of effluent collection and receiving treatment works will be maintained by the landowner and made available to the LPA on request or presented at an agreed frequency i.e. 6-monthly or annually.

5 Future wastewater management

It is proposed to continue the wastewater management at site, as detailed above, until a time where nutrient credits are readily available. At this point the nutrient calculation will be revised to include a connection to the mains foul water and discharge to Sellindge wastewater treatment works.

6 Conclusion

The nutrient budget for the proposed development of four dwellings at Stanford, Kent has been calculated. The development is nutrient neutral will not require mitigation due to the proposed temporary wastewater management, whereby wastewater will be treated on site, collected, store and tankered to a local wastewater treatment works located outside of the Stodmarsh River Stour SAC / Ramsar catchment.

Therefore, it is concluded that the proposed development will not prevent the Conservation Objectives for Stodmarsh SAC from being achieved.

APPENDIX 401/NNAMS/A2 – Nutrient Calculations

Water infrastructure information		
Description of required information	Data entry column - user inputs required	Additional data entry column - user inputs may be required
Date of first occupancy (dd/mm/yyyy):		
Average occupancy rate (people/dwelling or people/unit):	2.40	
Water usage (litres/person/day):	120	
Development proposal (dwellings/units):	4	
Wastewater treatment works:	Package Treatment Plant user defined	
Current wastewater treatment works P permit (mg TP/litre):	Enter value in cell C10	0
Current wastewater treatment works N permit (mg TN/litre):	Enter value in cell C11	0
Not applicable	Not applicable	
Not applicable	Not applicable	
Not applicable	Not applicable	
Not applicable	Not applicable	
Final calculation of nutrient load from wastewater		
Description of values generated	Values generated	
Wastewater nutrient loading		
Additional population (people):	9.60	
Wastewater by development (litres/day):	1152.00	
Annual wastewater TP load (kg TP/yr):	0.00	
Annual wastewater TN load (kg TN/yr):	0.00	
Not applicable		
Not applicable	Not applicable	
Not applicable	Not applicable	
Not applicable		

Current land use information		
Description of required information	Data entry column - user inputs required	
Operational catchment:	Upper Stour	
Soil drainage type:	Freely draining	
Annual average rainfall (mm):	750.1 - 800	
Within nitrate vulnerable zone (NVZ):	Yes	
Current land uses		
Existing land use type(s) - user inputs required	Area (ha) - user inputs required	Annual phosphorus nutrient export (kg TP/yr)
		Annual nitrogen nutrient export (kg TN/yr)
Residential urban land	0.40	0.62
		5.78

Future land uses		
New land use type(s) - user inputs required	Area (ha) - user inputs required	Annual phosphorus nutrient export (kg TP/yr)
		Annual nitrogen nutrient export (kg TN/yr)
Residential urban land	0.40	0.62
		5.78

Total nutrient budget calculations	
Description of values generated	Values generated
Wastewater TP load (kg TP/year):	0.00
Net land use TP change (kg TP/year):	0.00
P budget (kg TP/year):	0.00
P budget + 20% buffer (kg TP/year):	0.00
Wastewater TN load (kg TN/year):	0.00
Net land use TN change (kg TN/year):	0.00
TN budget:	0.00
TN budget + 20% buffer:	0.00
Annual nutrient budget	
The total annual phosphorus load to mitigate is (kg TP/yr):	0.00
The total annual nitrogen load to mitigate is (kg TN/yr):	0.00
Not applicable	
Not applicable	Not applicable
Not applicable	Not applicable
Not applicable	
Not applicable	Not applicable
Not applicable	Not applicable