

Engineering Justification Paper

# CPM5293 Burgess Hill DPG (West Sussex IPMP)

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# 1 Table of Contents

<b>1 Table of Contents</b> .....	<b>2</b>
<b>2 Introduction</b> .....	<b>3</b>
2.1 General Background .....	3
2.2 Site Specific Background.....	3
<b>3 Equipment Summary</b> .....	<b>4</b>
<b>4 Problem Statement</b> .....	<b>4</b>
4.1 Narrative Real-Life Example of Problem .....	5
4.2 Spend Boundaries.....	6
<b>5 Probability of Failure</b> .....	<b>6</b>
5.1 Probability of Failure Data Assurance .....	6
<b>6 Consequence of Failure</b> .....	<b>8</b>
<b>7 Options Considered</b> .....	<b>9</b>
7.1 Options Summary .....	9
7.2 Option 1 Summary – Replace Burgess Hill DPG.....	9
7.3 Option 2 Summary - Downrate Anstey IP system to MP.....	10
7.4 Option 3 Summary - Interruption.....	11
7.5 Options Technical Summary Table .....	11
7.6 Options Cost Summary Table .....	12
<b>8 Business Case Outline and Discussion</b> .....	<b>12</b>
8.1 Key Business Case Drivers Description .....	12
8.2 Business Case Summary .....	13
<b>9 Preferred Option Scope and Project Plan</b> .....	<b>13</b>
9.1 Preferred option .....	13
9.2 Asset Health Spend Profile .....	13
9.3 Investment Risk Discussion .....	13
<b>Appendix A - Categorisation of Potential Load Growth</b> .....	<b>15</b>
<b>Appendix B - Overall Sites Driving Reinforcement</b> .....	<b>16</b>
<b>Appendix C - List of Acronyms</b> .....	<b>17</b>

## 2 Introduction

Reinforcement has been identified within the West Sussex MP system, specifically relating to an anticipated system capacity failure at Burgess Hill DPG. This project is part of a wider programme of reinforcement associated with the RIIO-GD2 Business Plan Appendix covering Capacity Management.

### 2.1 General Background

The SGN distribution system is built to ensure security of supply for all our customers. Our networks operating at pressures below 7bar are designed to meet a peak six-minute demand level that could be experienced under 1 in 20 conditions, supporting a safe, secure and reliable service to those customers and meeting requirements outlined within our Licence Condition, including, but not limited to, Condition 16 contained therein.

Link: [Gas Transporters Licence – Standard Conditions](#)

Where capacity constraints are identified that are likely to impact on our ability to ensure security of supply to all customers, Network planning will look to establish optimum, cost-efficient reinforcement strategies to mitigate that risk. Such constraints may arise as a result of a number of factors, but the most common is increased demand levels, often resulting from new connections.

SGN has initiated an extensive programme of stakeholder engagement, working closely with Local Authorities, both in Scotland and the south of England, to establish a fully informed and independently sourced picture of planned development.

This engagement has provided us with confidence that the sites identified will progress to development and, to support this level of growth, we have developed a programme of reinforcement across its network.

### 2.2 Site Specific Background

Development found in the north-east of the West Sussex IPMP Grid (Burgess Hill MP) is primarily covered by the Mid Sussex and Lewes District Local Plans. The Local Plan sets out planning policies to guide development, such as housing and employment for the next 10-20 years. A collated list of documents is used to produce the local plan, these include Annual Monitoring Reports and Housing Land Audits. We have used the local plan and its associated documents to identify developments on each specific grid.

Development highlighted in the local plans and their associated documents, have been included in the SGN network model forecasts, which indicate a capacity issue at Burgess Hill DPG requiring reinforcement or replacement of the regulator within RIIO-GD2.

Identified drivers for the DPG replacement are numerous;

Significant domestic developments which are anticipated to develop within GD1-GD2:

- Burgess Hill Station Yard – Housing Land Audit (HLA) site – 150 dwellings.
- Keymer Tile Works – Development in progress – 475 dwellings still to be constructed.
- Land East of Kingsway - Development in progress – 480 dwellings still to be constructed.
- Northern Arc – Planning submitted and awaiting decision – 3,500 dwellings.
- Burgess Hill Town Centre – Planning permission – 142 dwellings.

Northern Arc and Burgess Hill Town Centre are the two most influential developments that have the most impact on the Burgess Hill DPG. See Appendix B for a full development trajectory of all sites.

### 3 Equipment Summary

The West Sussex IP/MP system (Grid 309) is part of the greater South East IP/MP system. The grid feeds several large settlement areas such as; Littlehampton, Horsham, Haywards Heath and Burgess Hill, it also encompasses eight different council areas.

Burgess Hill MP system is supplied through Burgess Hill DPG (1.8bar) in the south and Haywards Heath TRS (1.8bar) in the north. The flow from each of the sources come together and supply the leg leading down to the south-east of Haywards Heath. Burgess Hill DPG is supplied through Anstey TRS (6.9bar).

Security

### 4 Problem Statement

#### **Why are we doing this work and what happens if we do nothing?**

New connections to our networks reduce available capacity and when pressures are predicted to fall below minimum acceptable levels it is necessary to reinforce or increase pressures to facilitate increased capacity in the system.

In the case of Burgess Hill MP system, the potential development identified within the Local Plan and associated documents for Mid Sussex and Lewes, will see Burgess Hill DPG approach capacity within RII0-GD2.

Failure to reinforce the network will restrict the delivery of **these developments**.

#### **What is the outcome that we want to achieve?**

Maintain SGN's licence conditions to ensure security of supply, avoid becoming a blocker to development and support the economic prosperity of this area.

#### **How will we understand if the spend has been successful?**

On completion of the proposed reinforcement, SGN will monitor system performance to ensure expected system pressures are maintained. This will take the form of regular system performance checks and localised pressures surveys to ensure the successful outcome is delivered.

At a customer level, SGN will have delivered a reinforcement that ensures a safe and secure network, meets stakeholder aspirations and ensures developments progress timeously.

## 4.1 Narrative Real-Life Example of Problem

As a result of the proposed development sites up to 2026 and existing committed development growth, Burgess Hill DPG will reach its capacity of approx. 18.930scm/h. Capacity breach will result in reduced Outlet pressure (droop), to such an extent that security of supply to committed development within the MP section of the grid will be compromised.

A recent example of good planning to meet customer expectation, whilst also ensuring security of supply, occurred following the acceptance of a quotation to supply a new development at Milton Heights, Milton, Abingdon, Oxfordshire (P18143337).

Network analysis confirmed a requirement to reinforce SGN's system in advance of connecting the fully developed site load. However, network analysis also confirmed an interim load/connection of 72 new properties in advance of reinforcement, thereby meeting the GT/Developer's schedule of works.

Reinforcement to supply the full development was subsequently planned and completed in advance of connections beyond the interim load, ensuring security of supply to approximately 500 new/existing customers.

Security

Table 1 - Development Summary

Development Name	Site Usage	Site Status	Confidence
<b>Northern Arc</b>	3,500 Houses	Awaiting decision of submitted planning application	Probable (>75% confidence)
<b>Burgess Hill Town Centre</b>	142 Houses	Planning Permission	Highly Probable (>90% confidence)

Please see Appendix A of this document which gives further details of the criteria applied when determining the attributable 'confidence' level of the above sites progressing to development.

SGN have deemed the requirement for this reinforcement within RIIO-GD2as 'Low' and have therefore included the funding request in our high growth scenario.

## 4.2 Spend Boundaries

The spend associated with these reinforcement works provides capacity within the Burgess Hill MP system to support projected development during RIIO-GD2.

The monies associated with these works ensure security of supply for existing customers and connection of planned development to the network.

Costs contained within this paper have been prepared using average contracted rates at depot level and validated against known costs for similar, completed projects.

Not included within this spend are the costs for subsequent phases of reinforcement required to support demand out-with the RIIO-GD2 period and/or any costs associated with reinforcement of the upstream transmission system.

## 5 Probability of Failure

The existing South East IPMP model predicts a failure of Burgess Hill DPG to maintain its outlet pressure on the system at >90% of 1 in 20 demand by winter 2025/26. When capacity is reached a subsequent droop in MP Outlet pressure to the DPG is likely, creating a risk of failure to maintain Security of Supply to existing and proposed customers on the MP system extremities.

### 5.1 Probability of Failure Data Assurance

#### Model Validation

To ensure the accuracy of the Network Analysis models' validation is carried out in line with the published requirement under Section 17 of SGN's Safety Case and is a fundament of SGN's Licence to Operate.

Validation ensures that the current models are an accurate representation of the actual gas transportation system and can be used to predict network behaviour under a variety of conditions, including the 1 in 20 design condition.

In addition to the Validation Programme, a robust model maintenance process and annual system performance checks ensure that the models continue to be accurate and fit for purpose. The latest system performance review confirmed the accuracy of the model against actual pressures recorded on 31 January 2019.

Figure 3 – Burgess Hill MP Monitor Points Close to Burgess Hill DPG. Logger Graph 31/01/2019

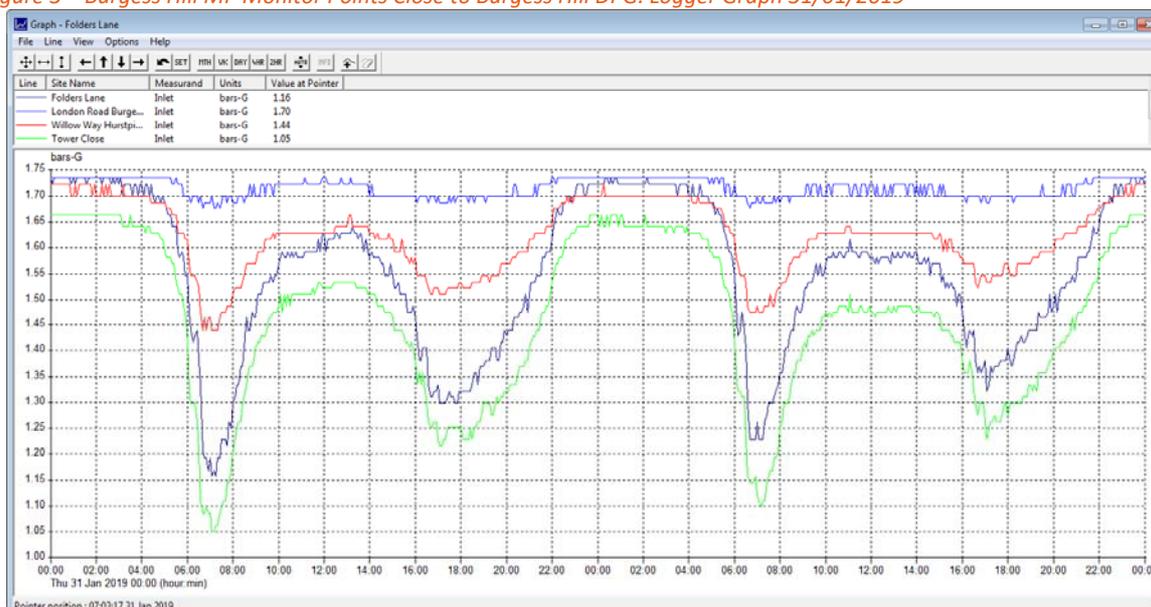


Table 2 - System Performance Review – 31st January 2019 (81% peak demand)

System	Site	System Pressure 81%		System Pressure (1 in 20)	
		Recorded Actual	Modelled Predicted	Min. Acceptable	Modelled Predicted
West Sussex MP	Folders Lane DG	1.17bar	1.4bar	0.35bar	1.07bar
West Sussex MP	London Road DG	1.68bar	1.7bar	0.35bar	1.67bar
West Sussex MP	Willow Way DG	1.44bar	1.55bar	0.35bar	1.39ar
West Sussex MP	Tower Close DG	1.05bar	1.27bar	0.35bar	0.85bar

### Security

#### Network Growth

The Local Plans and associated documents have been reviewed and an assessment made as to the probability of sites contained therein progressing to construction (see Table 1).

The resulting outputs have been applied to the network model, providing confidence that pre-emptive repair of the network (i.e. reinforcement) will be required during RIIO-GD2 to ensure SGN meets its Licence Conditions, maintaining minimum supply pressures under all demand conditions.

## 6 Consequence of Failure

### Loss of Supply to Customers

The Burgess Hill MP network will be unable to support both committed growth as well as proposed developments identified within the Local Plan, beyond 2025, in direct violation of SGN's license obligations to maintain Security of Supply of committed customer development.

Ultimately this will result in the failure of Burgess Hill DPG due to insufficient capacity and potentially the loss of supply to approximately 33,000 existing and new customers leading to a failure to meet SGN's Licence Conditions, attracting adverse publicity and damage to the company's reputation.

Other than domestic customers, affected customers will include multiple schools, Princess Royal Hospital, plus a further five medical establishments, Victoria Industrial Park and a high number of care homes.

Financially, after the first 24 hours, affected householders will be compensated for time without gas. Domestic customers will receive £41 for each 24-hour period without gas, small businesses will receive £69 for each 24-hour period without gas.

*Table 3 – Projected RIIO-GD2 (2025/26) Pressures Without Reinforcement*

Location	Min Required Pressure (bar)	Min. Modelled Pressure (bar)
Burgess Hill	0.35	-6.7

Security

### Safety Impact of Failure

Reinforcement of Burgess Hill MP system is required to meet the obligations of our Licence Condition.

In this instance, a failure to reinforce will result in a system failure during peak winter conditions. The resulting loss of supply may have serious health and safety implications for vulnerable customers who rely on gas for essential heating and cooking facilities.

### **Environmental Impact**

A system failure on this scale will result in a major recovery exercise. Environmental impacts will include increased travel to site by SGN operatives, leading to an increase in greenhouse gas emissions and disruption to the public.

On site, the use of fossil fuels to power plant and equipment required in the restoration of supplies will further increase greenhouse gas emissions, as will subsequent travel/plant in use for the reinstatement of public highways following the conclusion of these works.

## **7 Options Considered**

### **7.1 Options Summary**

In accordance with the guidelines set out in the Ofgem guidance document ‘Engineering Justification Paper Frameworks for RIIO-GD2 and RIIO-GT2’ – Appendix B (Section 7), the following options have been considered:

#### **Replace on Failure**

Wait until the network fails then replace the system. This option has been discounted due to non-compliance with SGN’s Licence Condition.

#### **Repair on Failure**

Mains reinforcement after the network has failed. This option has been discounted due to non-compliance with SGN’s licence condition.

#### **Pre-Emptively Replace**

Replace the network fails then replace the system. This option has been discounted as it is impracticable to replace the MP system.

#### **Pre-Emptively Repair**

Mains reinforcement and/or Interruption based on model data prior to network failure. Three options have been considered for further investigation:

- Option 1 – Replace Burgess Hill DPG
- Option 2 – Downrate Anstey IP system to MP
- Option 3 – Interruption

#### **Do Nothing**

This is not considered an option. Identified growth dictates the requirement to provide additional capacity on this system through reinforcement.

### **7.2 Option 1 Summary – Replace Burgess Hill DPG**

#### **The technical detail of option**

This option involves the replacement of Burgess Hill DPG on capacity grounds.

#### **The basis for cost estimate/unit cost**

Costs for this option, amounting to £0.689M, have been prepared using average contracted rates at depot level and validated against known costs for similar, completed projects.

#### **The perceived benefits of the option**

This option delivers a robust reinforcement solution within the West Sussex MP network.

### **Delivery Timescales**

The reinforcement is scheduled for 2025/26 and it is expected to be completed in the same financial year.

### **Key Assumptions Made**

It is assumed that known potential demand growth both within RIIO-GD2 period and beyond will require the same level of gas supply as that currently experienced.

### **Any other items that differentiate the option from the others considered**

Economically the best option.

## **7.3 Option 2 Summary - Downrate Anstey IP system to MP**

### **The technical detail of option**

This option involves downrating Anstey IP system to MP and the construction of 4km x 633mmPE MP to reinforce the existing parallel mains to attempt to mitigate the pressure loss. As a result, Burgess Hill DPG is no longer required and can be decommissioned.

### **The basis for cost estimate/unit cost**

Costs for this option, amounting to £9.627M, have been prepared using average contracted rates at depot level and validated against known costs for similar, completed projects.

### **The perceived benefits of the option**

This option delivers a robust reinforcement solution within the West Sussex MP network.

### **Delivery Timescales**

The reinforcement is scheduled for 2025/26 and it is expected to be completed in the same financial year.

### **Key Assumptions Made**

It is assumed that known potential demand growth both within RIIO-GD2 and beyond will require the same level of gas supply as that currently experienced.

### **Any other items that differentiate the option from the others considered**

No future maintenance to Burgess Hill DPG required as it will be decommissioned.

## 7.4 Option 3 Summary - Interruption

In addition to the above, consideration was given to Interruption.

As part of interruption reform, also known as the Mod 90 process, SGN has the option to offer a tender for interruptible contracts to customers to offset the need to invest for capacity.

Interruptible consumers receive discounted transportation charges for the flexibility they provide to the system for demand side management at times of high demand.

All eligible interruptible sites were reviewed, none are in a location where they could be considered as an alternative to reinforcement.

## 7.5 Options Technical Summary Table

Table 4 - Options Technical Summary Table

Option	First Year of Spend	Final Year of Spend	Volume of Interventions	Design Life (Years)	Total Cost (£M)
1. Replace Burgess Hill DPG	2025/26	2025/26	Replace DPG	10	0.689
2. Downrate Anstey IP system to MP	2025/26	2025/26	Approx. 4km x 630mmPE MP	10	9.627
			Decommission Burgess Hill DPG		
			Downrate Anstey TRS to 2bar		
3. Interruption	n/a	n/a	n/a	n/a	n/a

*Costs inclusive of Overheads and Efficiencies*

## 7.6 Options Cost Summary Table

Table 5 - Summary of Cost

Option	Volume of Interventions	Cost (£M)	Total (£M)
1	1.6km x 180mm PE MP	0.689	0.689
2	Approx. 4km x 630mmPE MP	9.627	9.627
	Decommission Burgess Hill DPG		
	Downrate Anstey TRS to 2bar		

*Costs inclusive of Overheads and Efficiencies*

## 8 Business Case Outline and Discussion

Validation, a robust model maintenance process and system performance checks have confirmed the accuracy of the West Sussex IPMP model for use in network analysis.

A full review of the relevant Local Plans and associated documents, followed by close engagement with stakeholders, has provided confidence in the level of development expected during RIIO-GD2.

The development outputs have been applied to the validated network model which predicts a failure at >90% pk demand by winter 2025/26, putting at risk supplies to 33,000 new/existing customers.

To mitigate this risk and meet licence conditions it will be necessary to pre-emptively reinforce the network during RIIO-GD2.

For the purposes of this report, costs associated with the identified options have been collated using average contracted rates at depot level and validated against known costs for similar, completed projects. There have been no external costs incurred in assessing the options considered as these have been prepared by the in-house Network Planning and Design teams.

### 8.1 Key Business Case Drivers Description

#### Pre-emptively Repair: Option 1

The current Burgess Hill DPG site is ideal, the location allows the DPG to easily feed north towards Haywards Heath, east into Burgess Hill and south towards Hassocks. Replacing and not moving the DPG means that there is no procurement land costs, inlet and outlet mains can be re-used.

#### Pre-emptively Repair: Option 2

The initial aim of this option was to reduce costs by utilising existing assets and to simply downrate the IP system to MP. Ideally this would mean the only major cost involved would be the decommission of Burgess Hill DPG. However, the existing 10"ST IP main saw substantial pressure loss and *will* require to be reinforced with 630mmPE MP over the full length (approx. 4km) for the option to be feasible.

Due to the length and main diameter of reinforcing the 10"ST, costs calculated were significant.

The existing 10"ST route is through a number of fields and then joins Sussex Way at a busy roundabout, which is one of the main entrances going into the centre of Burgess Hill. The main laying will likely cause major disruption to traffic at Sussex Way and to the fields land owners.

Table 6 - Summary of Key Value Drivers

Option No.	Name of Option	Key Value Driver
1	Replace Burgess Hill DPG	Economically the best option. Long-term solution.
2	Downrate Anstey IP system to MP	Significant expense. Long-term solution.

## 8.2 Business Case Summary

This project is driven by SGN's Licence Conditions to ensure security of supply.

Table 7 - Business Case Matrix

	North of Sturry	New TRS at Sturry
CAPEX (£M)	0.689	9.627
Design Life	10 years	10 years
Positive Impact/Pros	Meets license obligations to maintain security of supply and provides available capacity for future growth. No disruption to public.	Meets license obligations to maintain security of supply and provides available capacity for future growth.
Negative Impact/Cons		Likely to cause disruption to public. Overall cost

*Costs inclusive of Overheads and Efficiencies*

## 9 Preferred Option Scope and Project Plan

### 9.1 Preferred option

PRE-EMPTIVELY REPAIR – Option 1 – Replacement of Burgess Hill DPG

### 9.2 Asset Health Spend Profile

Table 8 - Summary of Schedule of Spend

Asset Health Spend Profile (£M)						
Pre GD2	2021/22	2022/23	2023/24	2024/25	2025/26	Post GD2
0	0	0	0	0	0.689	0

*Costs inclusive of Overheads and Efficiencies*

### 9.3 Investment Risk Discussion

#### Delay/Cancellations

The project is demand driven by a number of developments. If these developments are delayed or the developer pulls out, then the investment will be a risk as the reinforcement may be postponed to a later date or no longer be required.

Mid-Sussex Council was contacted regarding the details of the developments and as a result SGN were sent the latest development trajectories for all sites in the district. The information gave SGN confidence that the developments would be constructed and trigger the requirement to reinforce.

## **Costs**

SGN have prepared costs using average contracted rates at depot level and have validated them against known costs for similar, completed projects. Nevertheless, whilst all reasonable steps have been taken to ensure accuracy of costs outlined in this paper, it is recognised that external variables may change and subsequently impact on actual costs at time of construction. Examples of such could include unforeseen increases in contractor rates driven by a surplus of market demand for labour or sharp cost increases for materials.

### **Costs Under/Overspend**

Factors such as market driven demand linked to the economy, the UK's potential exit from the European Union, emerging decarbonisation strategies and industry innovation can potentially impact on the scope of works outlined in this paper. SGN has proposed a volume driver funding mechanism to de-risk underspend/overspend for these works. Further details of this proposal can be found in Section 6.2 in the RIIO GD2 Business Plan Appendix for Capacity Management.

### **Political/Environment Situation (i.e. low/zero carbon)**

As stated in the SGN Environmental Action Plan, and in line with current UK Government targets, SGN's long term target is to achieve Net Zero emissions by 2045. This means a decarbonisation of the energy network and supporting the transition to an environmentally sustainable low-carbon energy system. Indeed, SGN recognise that there have been preliminary government targets set facilitating a move toward a renewable or low carbon heat solutions by the end of the RIIO-GD2 period. As such, throughout the RIIO-GD2 period we will continue to closely monitor this emerging heat strategy with a view to refining any potential impact on current growth forecasts.

## Appendix A - Categorisation of Potential Load Growth

The following Table sets out the manner in which identified potential load growth has been categorised and applied, leading to customer driven reinforcement, when looking to establish the optimum investment strategy for SGN networks.

DEFINITION TABLE				
Confidence	Definition	Factors to be considered	Base Growth	High Growth
Highly probable (>90% confidence)	Connection expected in RIIO-GD2 for all sites	<ol style="list-style-type: none"> <li>1. Quotation accepted but not yet on stream</li> <li>2. Building is in progress.</li> <li>3. Detailed planning permission granted.</li> <li>4. Economic conditions indicate that sites for consumers of a particular type are likely to be developed, e.g.               <ol style="list-style-type: none"> <li>a. Domestic sites where there is a high demand for housing and there is a shortage of land available.</li> <li>b. Interest has been shown in having a connection made to a non-domestic site and economic factors suggest development will go ahead.</li> </ol> </li> </ol>	✓	✓
Probable (>75% confidence)	Connection Likely in RIIO-GD2 for majority of sites	<ol style="list-style-type: none"> <li>1. Outline planning consent has been granted.</li> <li>2. Recent development has been carried out in the area.</li> <li>3. The land is a prime site for development, but no connection enquires have yet been received.</li> <li>4. Adopted Local Plan Site</li> </ol>	✓	✓
Good prospects (>50% confidence)	Connection expected for some sites in RIIO-GD2	<ol style="list-style-type: none"> <li>1. Proposed Local Plan Site</li> <li>2. No indication of planning permission being granted for the site.</li> <li>3. The site is outside existing gas supply areas.</li> <li>4. The site would involve physical problems in delivering a gas supply.</li> <li>5. The site would require substantial additional infrastructure, e.g. additional roads, schools.</li> <li>6. Site marked “reserve” in Local Plan.</li> <li>7. Site is known to be contaminated ground.</li> <li>8. Site has “protection” orders served over it – e.g. SSSI.</li> </ol>		✓
Poor prospects (<50% confidence)	Significant time or investment required to progress	<ol style="list-style-type: none"> <li>1. Does not meet the above planning criteria.</li> <li>2. Site has been deemed as ‘speculative’.</li> <li>3. The site would require significant additional infrastructure, e.g. additional roads, schools.</li> </ol>		

## Appendix B - Overall Sites Driving Reinforcement

### Domestic

Town	Site	Site Reference	Sum of GD1	Sum of GD2	Sum of Post GD2	Sum of Total
<b>Burgess Hill</b>	Burgess Hill Station Yard	HLA 83	0	150	0	150
<b>Burgess Hill</b>	Keymer Tile Works	14/02830/REM, DM/16/2718, DM/16/5617	283	192	0	475
<b>Burgess Hill</b>	Land East of Kingsway	14/0208/REM, DM/16/2204, 12/01532/OUT	323	157	0	480
<b>Burgess Hill</b>	Northern Arc	DM/18/5114	0	1406	2094	3500
<b>Burgess Hill</b>	Burgess Hill Town Centre	DM/15/3858	57	85	0	142

The above trajectory is based on council trajectories of the sites.

## Appendix C - List of Acronyms

Acronym	Backronym (spelled out acronym)	Definition / explanation
<b>Pressure Tiers</b>		
○ <b>HP</b>	○ High Pressure	○ High Pressure i.e. above 7bar LTS (NTS)
○ <b>IP</b>	○ Intermediate Pressure	○ Intermediate Pressure i.e. 2 – 7bar
○ <b>MP</b>	○ Medium Pressure	○ Medium Pressure i.e. up to 2bar
○ <b>LP</b>	○ Low Pressure	○ Low Pressure i.e. up to 75mb
<b>CSEP</b>	Connected System Exit Point	Third party connection to Gas network from an iGT or UIP
<b>DG</b>	District Governor	Pressure regulator primarily used for reducing pressures from IP and MP tiers to LP.
<b>DPG</b>	Distribution Pressure Governor	Pressure regulator primarily used for reducing pressures from IP tier to MP.
<b>HDPE</b>	High Density Polyethylene	Material standard for plastic pipe – High density allows for use at > 2bar operation due to thicker pipe wall. Reduced internal diameter increases weight of pipe, is not suitable for use < 2bar. Cheaper material and jointing than Steel.
<b>iGT (GT)</b>	Independent Gas Transporter	Third party supplier of gas and infrastructure to closed developments, not generally adopted by SGN.
<b>LTS</b>	Local Transmission System	High Pressure system feeding from National Offtakes to P(T)RS Inlets
<b>MDPE</b>	Medium Density Polyethylene	Material standard for plastic pipe – Medium density allows for greater internal diameter for extra capacity required at lower tiers, but thinner pipe wall thickness is not considered safe for operation at >2bar. Cheap material and jointing due to electro fusion welding.
<b>MOP</b>	Maximum Operation Pressure	Highest design pressure for a mains system, however regulator may be set lower than this but not higher.
<b>NTS</b>	National Transmission System	High Pressure system feeding National Offtakes from Terminals
<b>PMAC</b>	Pressure Management and Control	Third Party monitoring system which communicates live data via BT Comms link, facilitates remote control of pressure settings and profiles on SGN Plant, used at all Plant levels.
<b>P(T)RS</b>	Pressure (Transmission) Regulator Station	Pressure regulator primarily used for reducing pressures from HP (LTS/NTS) tier to IP / MP or LP.
<b>UIP</b>	Universal Infrastructure Provider	Provides and connects infrastructure to gas network but does not supply gas. UIP infrastructure is generally adopted by SGN.
<b>RIIO-GD1</b>	Revenue=Incentives + Innovation + Outputs – Gas Distribution 1	8-Year price control period (2013-2021)
<b>RIIO-GD2</b>	Revenue=Incentives + Innovation + Outputs – Gas Distribution 2	Proposed 5-Year price control period (2021-2026)
<b>SHP</b>	SHP File Format	SHP is a file extension for a Shapefile shape format used in geographical information systems (GIS) software.

<b>ST</b>	STEEL	Steel pipe material is used where PE cannot i.e. protection from heavy traffic or bridge crossings, Regulator outlets where excessive gas cooling may be experienced at pressure reduction. Steel pipe laying can be expensive due to welded joints.
<b>1:20</b>	1:20 Demand Conditions	Designing a network to operate whilst experiencing demand conditions historically only seen every 20 years, during severe weather events.