Hartfell Homes and Loreburn Housing Association Selkirk Road Masterplan Area, Moffat.

Drainage Strategy



Civil Engineers

Structural Engineers

Project Managers

Document No: AA4777/9/1/DS/01A

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	Name	Signature	Date
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Purpose of Issue	F	Planning	

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Surface Water Drainage

This Masterplan site encompasses two watercourses. The Crosslaw Burn bisects the site from north to south and the Birnock Water in the north western periphery. In accordance with current Scottish Water policy consideration must be given to infiltration of surface water runoff where possible.

Run-off that cannot be discharged to ground will be conveyed by an adoptable sewer network to adoptable SuDS features and discharged a greenfield run-off rates to the watercourses on site. Site development will be phased, with each phase having SuDS provision as indicated on the catchment study drawing in appendix 1. Detailed drainage impact assessments will be required for each phase to accompany future applications in accordance with LDP2 supplementary guidance 'Surface Water Drainage and Sustainable Drainage (Systems SuDS)'. SuDS attenuation should be designed to accommodate 1:30-year AEP flows without surcharging. To prevent an overall increase to unacceptable on or off-site flood risk designs, for SuDS attenuation systems must also cater for exceedance flows for rainfall events between 1:30 and 1:200 AEP. Assessment of overland flood flow routes for design period exceedance events should also be considered and included in the Drainage Impact assessment to ensure that land or property elsewhere is not detrimentally affected.

Overland flows from adjacent farmland will be intercepted at the site boundary and conveyed to the watercourses for disposal.

Foul drainage

A Pre-Development Enquiry (PDE) response from Scottish Water (see appendix 2) confirms capacity in the wastewater treatment works for the Masterplan area. All foul wastewater from the development site will drain by gravity to Scottish Water's sewer network. Scottish Water have undertaken a strategic Stage 1 Network Impact Assessment for the development sites identified in the Local Development Plan to ensure network capacity. The report summarises the available capacity of the existing combined sewer network, predicted impact from the catchment growth within the Local Development Plan, and outlines high level desktop solutions to mitigate the impact on the network. As summarised in the extract from Scottish Water's report below:


Moffat	NIA0449				a.
	water removal of 0.506ha of road (Ballplay Rd) draining	water removal of 0.35ha of road (Well Rd) draining to nearby			
Available ne	twork capacit	(Housing units)	prior to network upgrade	25	- 1
Development Reference & Name	Unit Type	Housing Units / Point of Connection (Co-ordinates & Asset Equivalent description)			
		¥.		~	7
Old Carlisle Road, Mof	f Domestic	34	NT09041702		Ĭ
Dickson's Well, Well R	o Domestic	6	NT08058303		Yes
Selkirk Road, Moffat P	h Domestic	150	NT09052601	Yes	
Greenacres, Moffat	Domestic	15	NT09040601		
	n Domestic	10	NT08053505		
Former Moffat Acader	ii Doillestic				
Former Moffat Acader Fellside, Old Carlisle R		11	NT09042408		
	lc Domestic		NT09042408 NT09041701		

The report states that the existing network has capacity for an additional 25 housing units without the need to upgrade the network or mitigate impacts. Additional housing units beyond the 25-unit trigger will induce flooding from the combined sewer.

A number of options were considered to provide network capacity. Scottish Water's preferred solution is to remove surface water contributing to flows in the network to free up capacity for foulwater from new development. The report recommends removal of surface water, equalling 0.506ha of road, split between Ballplay Road and Selkirk Road with the separated surface water diverted to the Crosslaw Burn. Phase 1 of the proposed development has 75 units exceeding the trigger, meaning the off-site would have to be addressed before any houses are occupied. This solution provides capacity for the entire masterplan area.

The mitigation measures will be undertaken by the developer at their cost. The developer will then recover a contribution toward costs via a Reasonable Cost Contribution from Scottish Water. This will be subject to SEPA and Dumfries and Galloway Council approval, however, should it not be achievable, an alternative option was also identified to upgrade the existing combined sewer network by increasing pipe sizes to the wastewater treatment works to accommodate the additional flow from the development. Similar to the first option, this capacity increase will be required for Phase 1 of the development and will provide network capacity for the entire Masterplan area.

Appendix 1 – AA4777/MP/07 Catchment Study Drawing



<u>Appendix 2 – Scottish Water Pre-Development Enquiry Response</u>



30th May 2019

Attn David Lorimer Asher Associates Ltd 32 George Street Dumfries DG1 1EH

SCOTTISH WATER

Customer Connections
The Bridge
Buchanan Gate Business Park
Cumbernauld Road
Stepps
Glasgow
G33 6FB

Customer Connections
Freephone Number - 0800 3890379
E-Mail - CustomerConnections@scottishwater.co.uk
www.scottishwater.co.uk

Dear Mr David Lorimer

DG10 Moffat Auldton Development at Development Enquiry Application – incomplete application

Your Ref: AA4777 Our Ref: 753310

Thank you for your application regarding the above proposed development. Please note our reference number, which should be quoted on all future correspondence.

Following a capacity review we can now confirm the following:

Assessment of capacity at our treatment works:

There is currently sufficient capacity in the **Moffat** Water Treatment Works to service your development.

There is currently sufficient capacity in the **Moffat** Waste Water Treatment works to service your development.

Assessment of our network:

Further studies are required to be carried out to determine if our existing water network can adequately service the demands of your development.

Water: A Flow and Pressure test (F&PT) is required for this development.

You may appoint your preferred consultant to undertake these works, or alternatively, if you wish Scottish Water to obtain a quote on your behalf we will arrange this via one of our commercial partners who will contact you directly.

Please contact me to confirm how you wish to proceed with these works.

Wastewater: A Drainage Impact Assessment (DIA) is required for a development of this size to determine if our existing network can adequately service the demands of your development or if any mitigation/enhancement work is required.

<u>For Information</u> - A member of our Network Impact Assessment Team will contact you in 5 working days to discuss.

If you have any questions in relation to the network assessment, contact us at WIA/DIAMailbox@scottishwater.co.uk

Scottish Water is committed to assisting development in Scotland and has funding under our current investment period to upgrade our water and waste water treatment works however our regulations from the Scottish Executive for our current investment programme (2015-2021) state that should your development require Scottish Water networks to be upgraded this cost will have to be met by the developer; Scottish Water may contribute towards the cost of these works, including the required study, via Reasonable Cost Contribution regulations.

Please Note:

Waste Water

The above waste water assessment is based on a foul only connection. All surface water to discharge to watercourse as per application. This will require permission from local authority and SEPA. Foul and surface water to be separated within the site.

General Notes:

Please be advised that Scottish Water will only accept surface water into the combined network under exceptional circumstances. In the consideration of any development, if due diligence has been carried out in fully investigating the available options for surface water drainage and if any of these options is subsequently deemed unreasonable to pursue, the remaining alternative options can then be considered for approval to allow the development to proceed.

Scottish Water's current minimum level of service for water pressure is 1.0 bar or 10m head in the public main. Any property which cannot be adequately serviced using this pressure may require private pumping arrangements installed, subject to compliance with the current water byelaws.

Scottish Water is unable to reserve capacity and connections to the water & wastewater networks can only be granted on a first come first served basis. For this reason we may have to review our ability to serve the development on receipt of an application to connect.

If you have any general questions or require a site visit, please contact our Central Support Mailbox at DevelopmentOperations@scottishwater.co.uk where our team will be happy to assist you.

Yours sincerely

Laura Bunton
Development Operations Technical Analyst
Laura.Bunton2@scottishwater.co.uk

Scottish Water Disclaimer:

"It is important to note that the information on any such plan provided on Scottish Water's infrastructure, is for indicative purposes only and its accuracy cannot be relied upon. When the exact location and the nature of the infrastructure on the plan is a material requirement then you should undertake an appropriate site investigation to confirm its actual position in the ground and to determine if it is suitable for its intended purpose. By using the plan you agree that Scottish Water will not be liable for any loss, damage or costs caused by relying upon it or from carrying out any such site investigation."

Appendix 3 – Flow and Pressure Report





Asher Associates Ltd

Selkirk Road, Moffat Development

Flow & Pressure Testing

Approved Report

20th May 2019





Document Control Sheet

Client	Asher Associates Ltd	
Project Title	Selkirk Road, Moffat Development	
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Revision	Status	Author(s)	Review	Approval	Issue Date
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	5				



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1. Introduction

A flow & pressure test was carried out within the Moffat Burgh DMA to investigate the impact at a proposed residential development at Selkirk Road, Moffat. The site will contain 222 residential units with a peak demand of approximately 4 l/s.

The aim of the study is to assess the impact of the development upon existing customers and the local distribution network by undertaking a flow test at a location close to the proposed development. The impact of the flow test on pressures will be monitored by installing pressure loggers on hydrants close to critical points in the network.

2. Methodology

2.1 Flow & Pressure Testing

The impact of the proposed development upon existing customers and the local distribution network was investigated by undertaking a flow test as close to the estimated connection point as possible. The impact of the flow test on pressures was monitored by installing eight pressure loggers on hydrants close to the critical points within the Moffat Burgh DMA.

The flow test commenced on the 1st of April 08:23. A maximum flow of 4l/s was extracted in order to better understand the sensitivity of the network. The flow test was carried out in the following stages;

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08:23am - 08:27am = 1 l/s

08:28am - 08:32am = 2 l/s

08:33am - 08:37am = 3 l/s

08:37am - 08:42am = 4 l/s

08:43am = Hydrant closed slowly
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2.2 Assessment of Impact upon Network

Flows were tested on the network at the nearest upstream hydrant to the proposed connection for the development. Pressures were monitored at a hydrant upstream of the connection during the testing, to ensure no properties suffered a temporary loss of supply. The impact of the additional demands on the network was analysed, and the ability of the network to supply the required flow was assessed.

A "before and after" assessment was undertaken on the local distribution mains network for a range of flows. The analysis was undertaken assuming the network was operating under normal conditions during the field test period. This includes the following assumptions:

- All DMA boundary valves are closed.
- The development would be connected to the existing 4"CI main on Selkirk Road.



3. Results

The field test consisted of the following eight logged hydrants. The locations are shown in Figure 1 below.

- Log 1 ERICSTANE, MOFFAT, DG10 9LS (200mm DI)
- Log 2 BEECHGROVE, MOFFAT, DG10 9RU (200mm DI)
- Log 3 -23 BEECHGROVE, MOFFAT, DG10 9RS (200mm DI)
- Log 4 OLD EDINBURGH ROAD, MOFFAT, DG10 9RU (6"SI)
- Log 5 HIGH STREET, MOFFAT, DG10 9DW (6"CI)
- Log 6 2 BIRNOCK WATER, HOLM STREET, MOFFAT, DG10 9DY (6" ST)
- Log 7 BIRNOCK WATER, HOLM STREET, MOFFAT, DG10 9DY (6" ST)
- Log 8 INGLEWOOD, HAYWOOD ROAD, MOFFAT, DG10 9BY (3"CI)

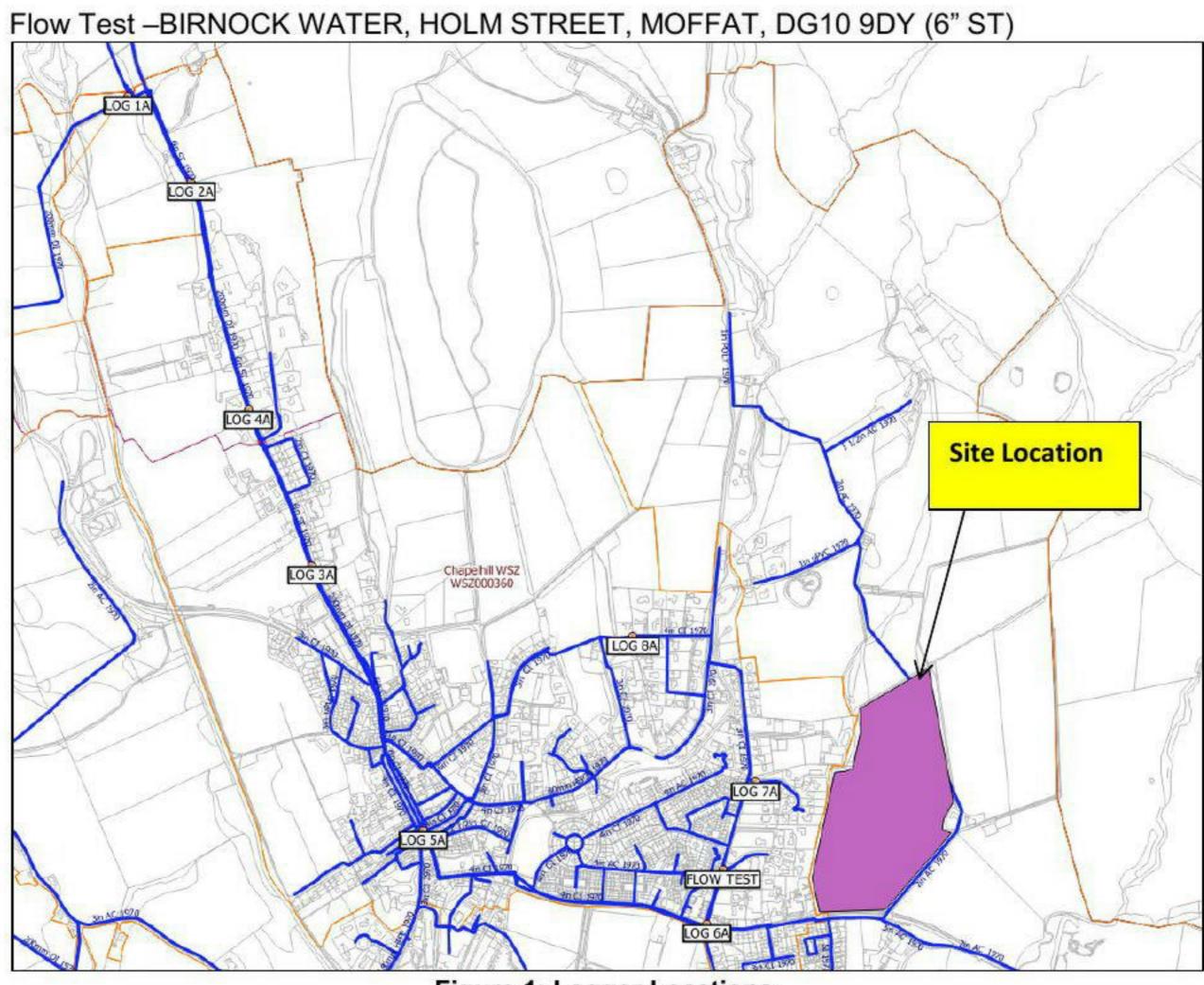


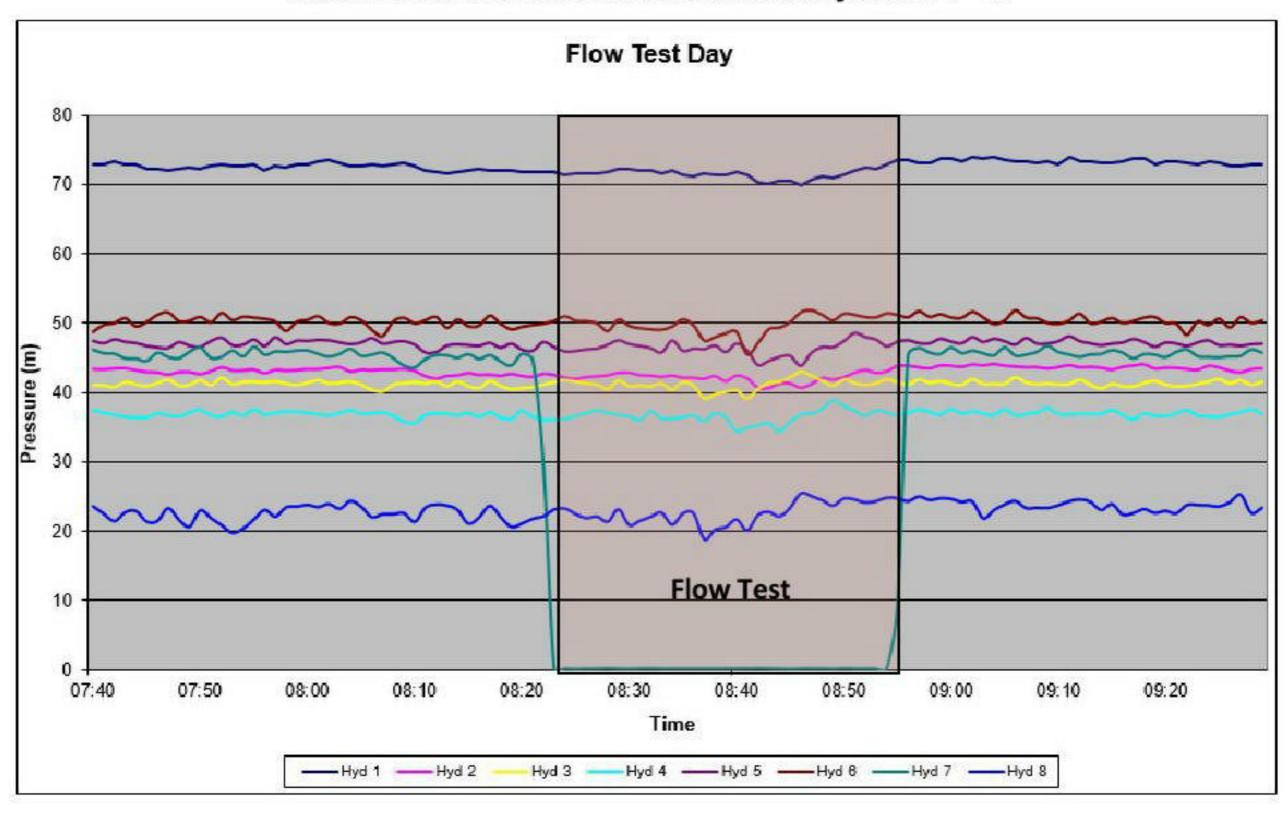
Figure 1: Logger Locations



The results of the flow and pressure tests are shown in Table 1 and Graph 1 below.

Additional Flow (I/s)	Pressure (m) at Log 1	Pressure (m) at Log 2	Pressure (m) at Log 3	Pressure (m) at Log 4	Pressure (m) at Log 5	Pressure (m) at Log 6	Pressure (m) at Log 7	Pressure (m) at Log 8
Normal Peak	71.30	41.86	35.20	30.85	41.37	42.72	39.70	17.23
0 (Prior to flow test)	71.73	42.24	40.43	36.08	46.07	49.08	44.5	20.55
1I/s	71.39	41.94	41.09	36.08	45.94	49.94		21.87
2l/s	71.88	42.43	40.44	36.08	46.44	48.82	Flow Test	20.81
3l/s	71.09	41.97	39.05	35.91	45.78	47.47		18.70
4l/s	70.23	40.75	39.07	34.52	43.93	45.48		20.04

Table 1: Flow and Resultant Pressure at Hydrants 1 – 8



Graph 1: Pressures during Flow Test



Graph 1 shows that the flow test had a slight impact upon the network with pressures reductions of up to 3.6m when 4 l/s was extracted at Hyd 7.

Pressures at the point of connection are currently expected to remain above 40m during normal network operations.

During the flow test period all pressures remained above 18m.

The hydraulic graident of the system during peak demand and the flow test can be viewed in appendix A and pressure data for the full field test period is contained in appendix B.

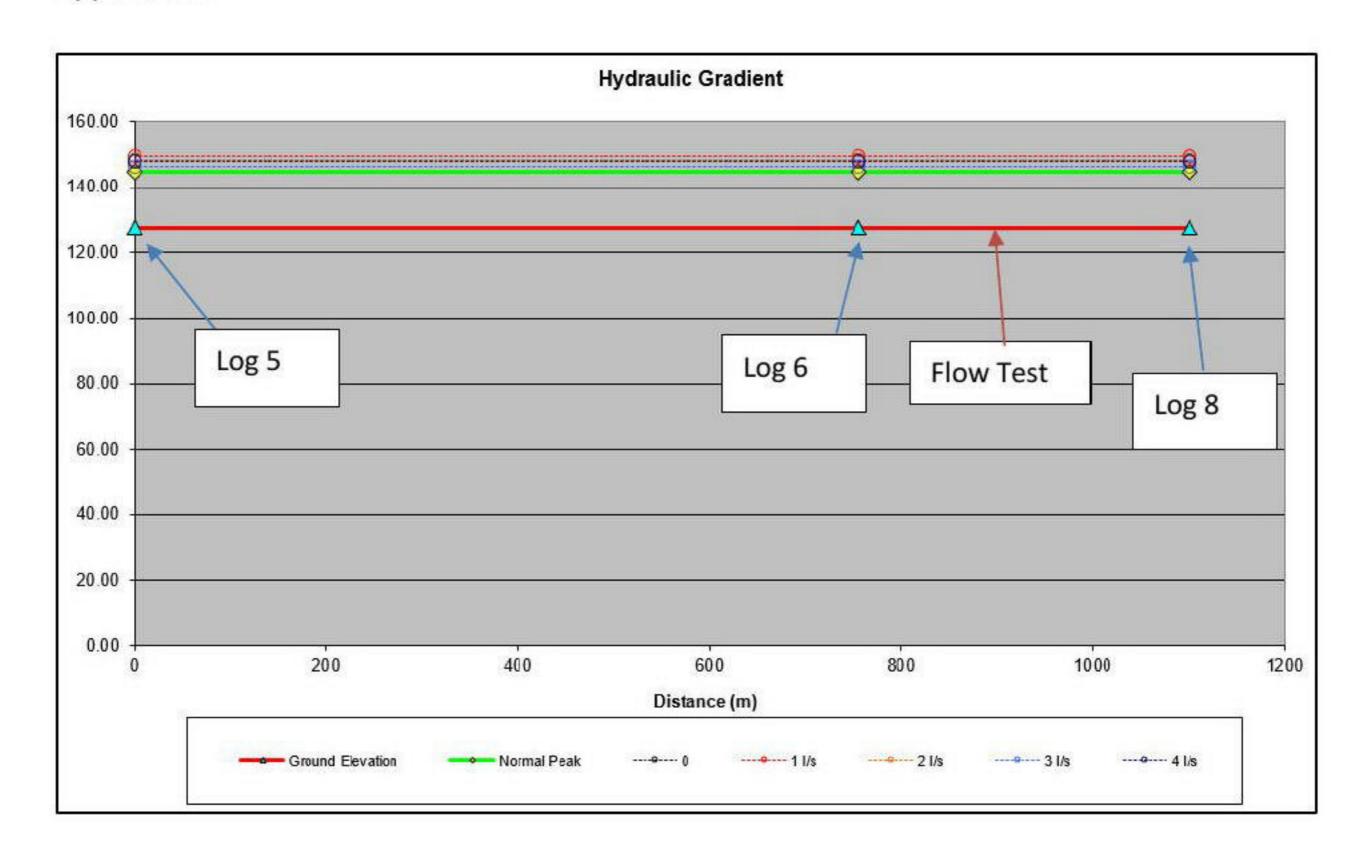
4. Conclusions & Recommendations

- The development at Selkirk Road cannot be supplied from the proposed point of connection Moffat Burgh DMA.
- Further discussions with SW the point of connection is preferred to be off the 110mmm MDPE main, as this has higher pressure and is more suited for the development (this will require a PRV).
- It should be noted that Scottish Water has no obligation to ensure that the current pressure and flow rate levels remain available in the future, and would not be liable for any third party issue should pressures be reduced from current levels.

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Appendix A





Appendix B

