



# **MAUI PIPELINE CAPACITY DISCLOSURE**

**Year Ending 31 December 2010**



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## 1. INTRODUCTION

This report comprises the Pipeline Capacity Disclosure of Maui Development Ltd ("MDL") pursuant to the Gas (Information Disclosure) Regulations 1997 (the "Regulations"), Schedule 1, Part 5, for the year ending 31 December 2010.

Vector Gas Limited (Vector) compiled this report, as Technical Operator for the Maui onshore gas pipeline, pursuant to its contract with MDL.

As far as practicable main section headings mirror those of Schedule 1, Part 5 of the Regulations. For additional clarity, the relevant clause number of Schedule 1 Part 5 is given alongside each main section heading, and some sub-section headings.

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## DISCLAIMER

Information contained in this report is presented in good faith for the purposes of the Regulations and to give an overview of the capacity of the Maui onshore gas transmission pipeline. No party should base business decisions on the information contained in this report without consulting MDL.

MDL will accept no responsibility for the consequences of any misunderstanding, misinterpretation or misuse of information contained in this report.

While reasonable care has been taken in the preparation of this report, MDL takes no responsibility for the consequences of any errors, which may be contained herein.

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## 2. PIPELINE DETAILS

(Ref. Schedule 1 Part 5, Clause 1)

The attached map and pipeline schematic ("Pipeline Schematic – Maui System") depict MDL's onshore high-pressure gas transmission pipeline. The latter shows all Intake Points, all Offtake Points and other pipeline stations. These include the Mokau compressor station, scraper stations and main line (ie line-break isolation) valves. Pipeline nominal diameters are also shown.

In the last financial year, the system had seven Intake Points (Receipt Welded Points). They were Oaonui, Tikorangi, Tikorangi #2, Ngatimaru Rd (receipt), Turangi Mixing Station, Kowhai and Frankley Rd. Frankley Rd delivery point is a Bi-directional Welded Point. All the seven Intake Points are shown on the map and schematic.

Distances between any two stations can be calculated from the respective station numbers shown on the schematic page 7, as follows:

The last 4 digits of each station number give the distance in km (ie wxy.z km) of that station from the origin of the main trunk pipeline or lateral, respectively.

*Example 1:* Pokuru Offtake Station has the station number 4002308. This means that this station is on the 400 (ie the main trunk) pipeline, and is 230.8 km downstream of Oaonui.

*Example 2:* The distance between the Huntly Offtake and Mokau Compressor stations is found by subtracting the upstream station number from the downstream, ie:

Huntly Offtake Station	=	4002906
Mokau Compressor Station	=	4001143
Distance between these points	=	176.3 km

For convenience, a certain amount of information has been extracted from the pipeline schematic and presented in the following table. The pipeline maximum allowable operating pressures ("MAOP") are also given.

**Table 2.1 Pipeline Details**

Pipeline Segment	Nominal Bore (mm)	Length (km)	Design MAOP (barg)
Oaonui- Frankley Rd	850	43.9	72.4
Frankley Rd - Huntly Offtake	750	246.7	72.4
NP Power Station lateral	500	9.1	49.6
Huntly Power Station lateral	400	8.7	49.6

**Table 2.2 Location Of Intake And Offtake Points**

Ref. Schedule 1 Part 5, Clause 1 (1)


INTAKE POINT	OFFTAKE POINT	STATION NUMBER	LOCATION		NZMS 260 GRID REF.
Oaonui Frankley Rd Tikorangi Tikorangi #2 Kowhai Ngatimaru Rd (receipt) Turangi Mixing Station		4000000	S.H.45	Oaonui	P20 873199
		4000439	Frankley Rd	New Plymouth	P19 012304
		4000688	Ngatimaru Rd	Tikorangi	Q19 209393
		4000688	Ngatimaru Rd	Tikorangi	Q19 209393
		4000688	Ngatimaru Rd	Tikorangi	Q19 209393
		4000670	Ngatimaru Rd	Tikorangi	Q19 210393
		4000710	Tikorangi Rd East	Tikorangi	Q19 246411
		4000001	S.H.45	Oaonui	P20 804002
		4000132	Parihaka Rd	Pungarehu	P20 848122
		4000231	Oxford Rd	Okato	P19 877212
		4000351	Wairau Rd	Oakura	P19 934300
		4000439	Frankley Rd	New Plymouth	P19 012304
		4000653	Bertrand Rd	Tikorangi	Q19 194390
		4000670	Ngatimaru Rd	Tikorangi	Q19 210393
		4001941	Mangatea Rd	Te Kuiti	S16 953161
		4001975	Oparure Rd	Te Kuiti	S16 963192
		4002135	Waitomo Valley Rd	Otorohanga	S16 021338
		4002308	Candy Rd	Te Awamutu	S15 040487
		4002374	Pirongia Rd	Pirongia	S15 047551
		4002753	Hakarimata Rd	Ngaruawahia	S14 991911
		4002906	Rotowaro Rd	Rotowaro	S13 928028
		4030086	Rotowaro Rd	Huntly	S13 002041
		4030087	Rotowaro Rd	Huntly	S13 002041
		4040091	Centennial Drive	New Plymouth	P19 988381

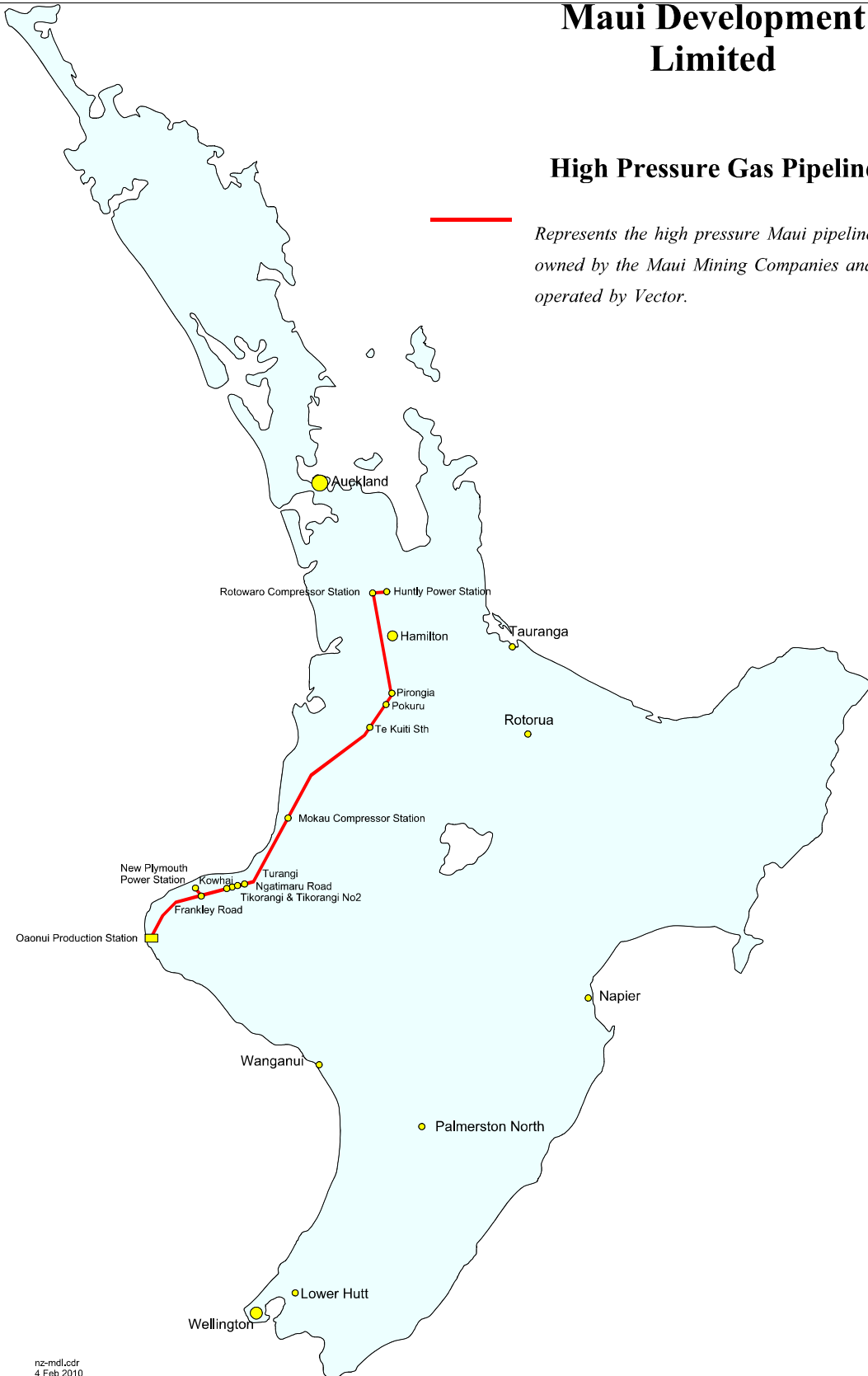
Note: In this table "Offtake Points" comprise physical offtakes from the MDL-owned pipeline only.



# Maui Development Limited

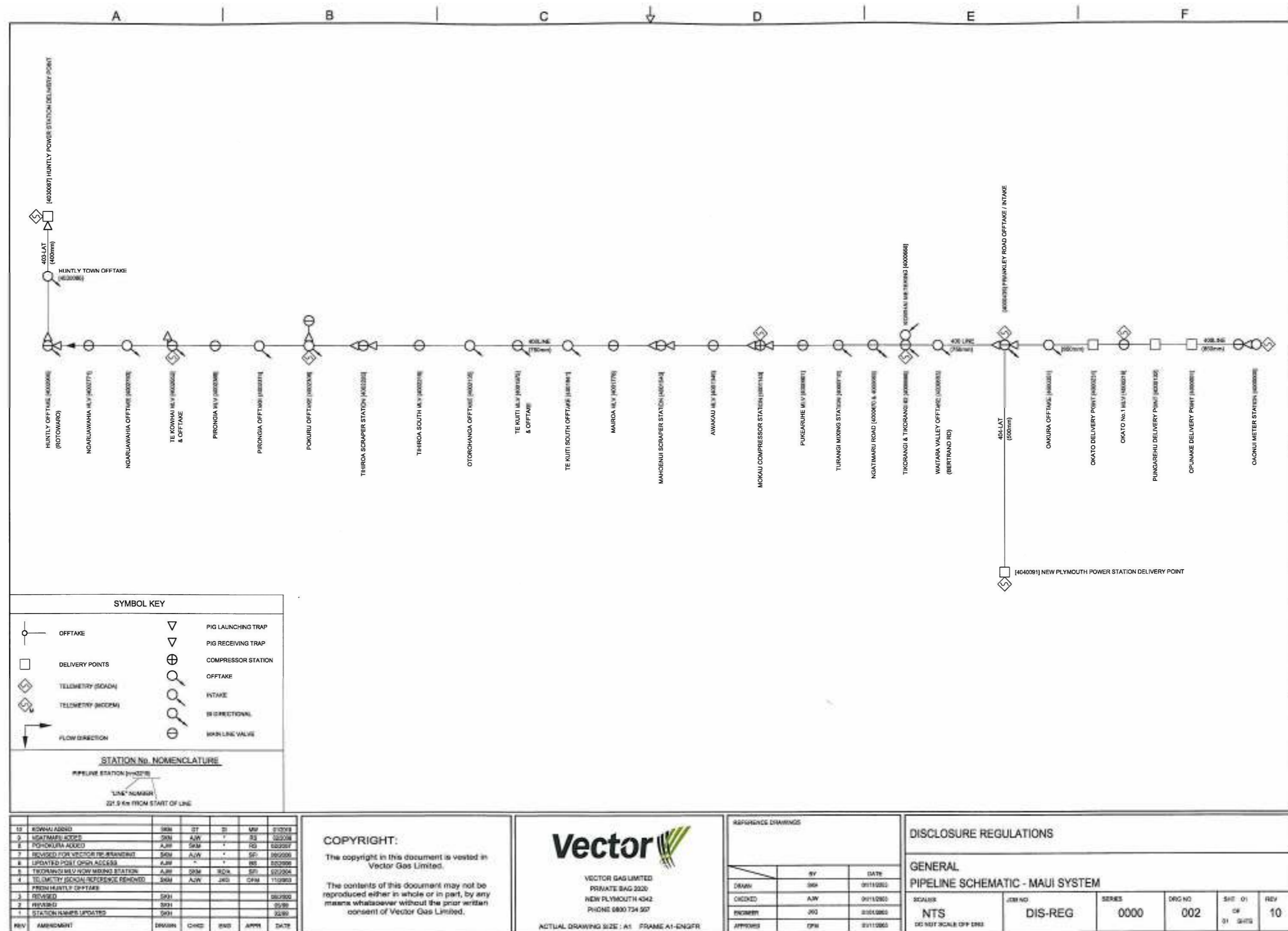
## High Pressure Gas Pipeline

 Represents the high pressure Maui pipeline owned by the Maui Mining Companies and operated by Vector.



nz-mdl.cdr  
4 Feb 2010

figure 2. Pipeline Schematic – Maui System



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### **3. INTAKE POINTS**

(Ref. Schedule 1 Part 5, Clause3)

In the year ending 31 December 2010, the Maui system had seven Intake Points (Receipt Welded Points). They were Oaonui, Tikorangi, Tikorangi #2, Ngatimaru Rd (receipt), Turangi Mixing Station, Kowhai and Frankley Rd. Frankley Rd is a Bi-directional Welded Point. Kowhai and Frankley Rd Intake Points were injecting little gas into the system in the system peak week, therefore the system was regarded as having five Intake Points for this disclosure purpose.

In calculating the numerical factor for throughput increase, flows for four of the five intake points were kept unchanged to their system peak flow rates, only one of five intake points was set free to supply the system need. It was applied to each intake point in turn in modelling (refer to Table 4.1.1 to Table 4.1.5).



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#### 4. OFFTAKE POINTS

(Ref. Schedule 1 Part 5, Clause 4)

Table 4.1.1 – Table 4.1.5 give the following information for the Maui pipeline:

- Date of the system peak week.
- The throughput of each Offtake Point in the system peak week.

For those Offtake Points with a peak weekly offtake greater than 2,000 GJ, the dates of the peak week for each such Offtake Points as well as the date of the peak week for the system as a whole.

The peak weekly throughput for all those Offtake Points with a peak weekly throughput greater than 2,000 GJ.

The throughput in the system peak week of each Offtake Point with a peak weekly throughput greater than 2,000 GJ.

The numerical factor (ie multiplier) by which the throughput of each Offtake Point with a peak weekly throughput greater than 2,000 GJ could have been increased in the system peak week assuming:

- the same load profile at each Offtake Point; and
- no capital expenditure on pipelines (ie no pipeline system expansion but excludes offtake upgrade costs for increased throughput); and
- no change in throughput at other Offtake Points.
- only one intake point increasing its supply into the system

The *increase* in weekly throughput after applying the above factor (NB: If the factor is "x" the *increase* is  $(x-1) \times$  weekly throughput).



**Table 4.1.1 Maui Pipeline Offtakes: Existing and Potential Throughput**

Ref. Schedule 1 Part 5, Clause 4 (4) (a) (b) and (c)

INTAKE POINTS	OFFTAKE POINTS	SYSTEM PEAK WEEK		INCREASE WITH NO CAPEX ON PIPELINE <sup>2</sup>		OFFTAKE PEAK WEEK	
		Week Ending	Throughput	(Factor)	(GJ)	Week Ending	Throughput
			(GJ)				(GJ)
Oaonui <sup>1</sup>	<i>offtakes &gt; 2,000 GJ in system peak week</i>	1-Aug-10	1,269,216	n/a	n/a	1-Aug-10	1,269,216
	Rotowaro	1-Aug-10	1,239,904	1.058	71,914	1-Aug-10	1,239,904
	Huntly Power Station	1-Aug-10	869,715	1.08	72,186	16-May-10	883,359
	Ngatimaru Rd	1-Aug-10	460,517	6.95	2,740,076	30-May-10	468,086
	Frankley Rd	1-Aug-10	232,328	13.50	2,904,100	14-Nov-10	886,108
	Bertrand Rd	1-Aug-10	110,288	20.70	2,172,674	7-Nov-10	329,047
	Pokuru	1-Aug-10	67,664	2.00	67,664	27-Jun-10	182,040
	Pirongia	1-Aug-10	5,840	13.20	71,253	5-Sep-10	15,278
	Te Kuiti South	1-Aug-10	722	26.10	18,117	21-Nov-10	4,633
		Total		2,986,978			

<i>offtakes &lt; 2,000 GJ in system peak week</i>		
Huntly Town	1-Aug-10	1,076
Te Kuiti North	1-Aug-10	628
Otorohanga	1-Aug-10	397
Opunake	1-Aug-10	210
Oakura	1-Aug-10	191
Ngaruawahia	1-Aug-10	148
Okato	1-Aug-10	62
Pungarehu	1-Aug-10	21
New Plymouth Power Station	1-Aug-10	0
	Total	2,733

Avg (GJ) = 304

TOTAL SYSTEM THROUGHPUT 2,989,711

Note: 1. Refer to Methodology section, Intake Points.

2. Refer to Methodology section "Throughput Increase in System Peak Week" about compressor configuration used in modelling. Theoretical compressor was used in modellings to minimize variables. Actual Mokau compressor capacity is less than the theoretical compressor.

**Table 4.1.2 Maui Pipeline Offtakes: Existing and Potential Throughput**

Ref. Schedule 1 Part 5, Clause 4 (4) (a) (b) and (c)

INTAKE POINTS	OFFTAKE POINTS	SYSTEM PEAK WEEK		INCREASE WITH NO CAPEX ON PIPELINE <sup>2</sup>		OFFTAKE PEAK WEEK	
		Week Ending	Throughput	(Factor)	(GJ)	Week Ending	Throughput
			(GJ)				(GJ)
Tikorangi <sup>1</sup>	<i>offtakes &gt; 2,000 GJ in system peak week</i>	1-Aug-10	121,283	n/a	n/a	31-Jan-10	232,057
	Rotowaro	1-Aug-10	1,239,904	1.058	71,914	1-Aug-10	1,239,904
	Huntly Power Station	1-Aug-10	869,715	1.08	69,577	16-May-10	883,359
	Ngatimaru Rd	1-Aug-10	460,517	194 <sup>3</sup>	88,879,781	30-May-10	468,086
	Frankley Rd	1-Aug-10	232,328	23.90	5,320,311	14-Nov-10	886,108
	Bertrand Rd	1-Aug-10	110,288	90 <sup>3</sup>	9,815,632	7-Nov-10	329,047
	Pokuru	1-Aug-10	67,664	2.00	67,664	27-Jun-10	182,040
	Pirongia	1-Aug-10	5,840	13.20	71,253	5-Sep-10	15,278
	Te Kuiti South	1-Aug-10	722	26.10	18,117	21-Nov-10	4,633
		Total		2,986,978			

<i>offtakes &lt; 2,000 GJ in system peak week</i>		
Huntly Town	1-Aug-10	1,076
Te Kuiti North	1-Aug-10	628
Otorohanga	1-Aug-10	397
Opunake	1-Aug-10	210
Oakura	1-Aug-10	191
Ngaruawahia	1-Aug-10	148
Okato	1-Aug-10	62
Pungarehu	1-Aug-10	21
New Plymouth Power Station	1-Aug-10	0
	Total	2,733

Avg (GJ) = 304

TOTAL SYSTEM THROUGHPUT 2,989,711

Note: 1. Refer to Methodology section, Intake Points.

2. Refer to Methodology section "Throughput Increase in System Peak Week" about compressor configuration used in modelling. Theoretical compressor was used in modellings to minimize variables. Actual Mokau compressor capacity is less than the theoretical compressor.

3. This high value is a consequence of the offtake point's close proximity to the intake point and the modelling methodology used (fixed pressure source). In practice this factor will not be achieved.

**Table 4.1.3 Maui Pipeline Offtakes: Existing and Potential Throughput**

Ref. Schedule 1 Part 5, Clause 4 (4) (a) (b) and (c)

INTAKE POINTS	OFFTAKE POINTS	SYSTEM PEAK WEEK		INCREASE WITH NO CAPEX ON PIPELINE <sup>2</sup>		OFFTAKE PEAK WEEK	
		Week Ending	Throughput	(Factor)	(GJ)	Week Ending	Throughput
			(GJ)				(GJ)
Tikorangi#2 <sup>1</sup>	<i>offtakes &gt; 2,000 GJ in system peak week</i>	1-Aug-10	329,768	n/a	n/a	28-Nov-10	423,240
	Rotowaro	1-Aug-10	1,239,904	1.058	71,914	1-Aug-10	1,239,904
	Huntly Power Station	1-Aug-10	869,715	1.08	69,577	16-May-10	883,359
	Ngatimaru Rd	1-Aug-10	460,517	203 <sup>3</sup>	93,024,434	30-May-10	468,086
	Frankley Rd	1-Aug-10	232,328	23.90	5,320,311	14-Nov-10	886,108
	Bertrand Rd	1-Aug-10	110,288	89.70 <sup>3</sup>	9,782,546	7-Nov-10	329,047
	Pokuru	1-Aug-10	67,664	2.00	67,664	27-Jun-10	182,040
	Pirongia	1-Aug-10	5,840	13.20	71,253	5-Sep-10	15,278
	Te Kuiti South	1-Aug-10	722	26.10	18,117	21-Nov-10	4,633
		<b>Total</b>		<b>2,986,978</b>			

<i>offtakes &lt; 2,000 GJ in system peak week</i>		
Huntly Town	1-Aug-10	1,076
Te Kuiti North	1-Aug-10	628
Otorohanga	1-Aug-10	397
Opunake	1-Aug-10	210
Oakura	1-Aug-10	191
Ngaruawahia	1-Aug-10	148
Okato	1-Aug-10	62
Pungarehu	1-Aug-10	21
New Plymouth Power Station	1-Aug-10	0
	<b>Total</b>	<b>2,733</b>

Avg (GJ) = 304

TOTAL SYSTEM THROUGHPUT 2,989,711

Note: 1. Refer to Methodology section, Intake Points.

2. Refer to Methodology section "Throughput Increase in System Peak Week" about compressor configuration used in modelling. Theoretical compressor was used in modellings to minimize variables. Actual Mokau compressor capacity is less than the theoretical compressor.

3. This high value is a consequence of the offtake point's close proximity to the intake point and the modelling methodology used (fixed pressure source). In practice this factor will not be achieved.

**Table 4.1.4 Maui Pipeline Offtakes: Existing and Potential Throughput**

Ref. Schedule 1 Part 5, Clause 4 (4) (a) (b) and (c)

INTAKE POINTS	OFFTAKE POINTS	SYSTEM PEAK WEEK		INCREASE WITH NO CAPEX ON PIPELINE <sup>2</sup>		OFFTAKE PEAK WEEK	
		Week Ending	Throughput	(Factor)	(GJ)	Week Ending	Throughput
			(GJ)				(GJ)
Ngatimaru Rd <sup>1</sup>	<i>offtakes &gt; 2,000 GJ in system peak week</i>	1-Aug-10	1,149,621	n/a	n/a	18-Apr-10	1,185,421
	Rotowaro	1-Aug-10	1,239,904	1.058	71,914	1-Aug-10	1,239,904
	Huntly Power Station	1-Aug-10	869,715	1.08	69,577	16-May-10	883,359
	Ngatimaru Rd	1-Aug-10	460,517	n/a	n/a	30-May-10	468,086
	Frankley Rd	1-Aug-10	232,328	23.90	5,320,311	14-Nov-10	886,108
	Bertrand Rd	1-Aug-10	110,288	89 <sup>3</sup>	9,705,344	7-Nov-10	329,047
	Pokuru	1-Aug-10	67,664	2.00	67,664	27-Jun-10	182,040
	Pirongia	1-Aug-10	5,840	13.20	71,253	5-Sep-10	15,278
	Te Kuiti South	1-Aug-10	722	26.10	18,117	21-Nov-10	4,633
		Total		2,986,978			

<i>offtakes &lt; 2,000 GJ in system peak week</i>		
Huntly Town	1-Aug-10	1,076
Te Kuiti North	1-Aug-10	628
Otorohanga	1-Aug-10	397
Opunake	1-Aug-10	210
Oakura	1-Aug-10	191
Ngaruawahia	1-Aug-10	148
Okato	1-Aug-10	62
Pungarehu	1-Aug-10	21
New Plymouth Power Station	1-Aug-10	0
	Total	2,733

Avg (GJ) = 304

TOTAL SYSTEM THROUGHPUT 2,989,711

Note: 1. Refer to Methodology section, Intake Points.

2. Refer to Methodology section "Throughput Increase in System Peak Week" about compressor configuration used in modelling. Theoretical compressor was used in modellings to minimize variables. Actual Mokau compressor capacity is less than the theoretical compressor.

3. This high value is a consequence of the offtake point's close proximity to the intake point and the modelling methodology used (fixed pressure source). In practice this factor will not be achieved.

**Table 4.1.5 Maui Pipeline Offtakes: Existing and Potential Throughput**

Ref. Schedule 1 Part 5, Clause 4 (4) (a) (b) and (c)

INTAKE POINTS	OFFTAKE POINTS	SYSTEM PEAK WEEK		INCREASE WITH NO CAPEX ON PIPELINE <sup>2</sup>		OFFTAKE PEAK WEEK	
		Week Ending	Throughput	(Factor)	(GJ)	Week Ending	Throughput
			(GJ)				(GJ)
Turangi <sup>1</sup>	<i>offtakes &gt; 2,000 GJ in system peak week</i>	1-Aug-10	127,541	n/a	n/a	29-Aug-10	192,560
	Rotowaro	1-Aug-10	1,239,904	1.058	71,914	1-Aug-10	1,239,904
	Huntly Power Station	1-Aug-10	869,715	1.08	69,577	16-May-10	883,359
	Ngatimaru Rd	1-Aug-10	460,517	343 <sup>3</sup>	157,496,814	30-May-10	468,086
	Frankley Rd	1-Aug-10	232,328	23.90	5,320,311	14-Nov-10	886,108
	Bertrand Rd	1-Aug-10	110,288	88.6 <sup>3</sup>	9,661,229	7-Nov-10	329,047
	Pokuru	1-Aug-10	67,664	2.00	67,664	27-Jun-10	182,040
	Pirongia	1-Aug-10	5,840	13.20	71,253	5-Sep-10	15,278
	Te Kuiti South	1-Aug-10	722	26.10	18,117	21-Nov-10	4,633
		Total		2,986,978			

<i>offtakes &lt; 2,000 GJ in system peak week</i>		
Huntly Town	1-Aug-10	1,076
Te Kuiti North	1-Aug-10	628
Otorohanga	1-Aug-10	397
Opunake	1-Aug-10	210
Oakura	1-Aug-10	191
Ngaruawahia	1-Aug-10	148
Okato	1-Aug-10	62
Pungarehu	1-Aug-10	21
New Plymouth Power Station	1-Aug-10	0
	Total	2,733

Avg (GJ) = 304

TOTAL SYSTEM THROUGHPUT 2,989,711

- Note: 1. Refer to Methodology section, Intake Points.  
 2. Refer to Methodology section "Throughput Increase in System Peak Week" about compressor configuration used in modelling. Theoretical compressor was used in modellings to minimize variables. Actual Mokau compressor capacity is less than the theoretical compressor.  
 3. This high value is a consequence of the offtake point's close proximity to the intake point and the modelling methodology used (fixed pressure source). In practice this factor will not be achieved.

## **5. FURTHER DISCLOSURE: OFFTAKE POINTS WITH THROUGHPUT LESS THAN 2,000 GJ/WEEK**

(Ref. Schedule 1 Part 5, Clause 5)

Table 4.1.1 – Table 4.1.5 also show the following information for Offtake Points with a throughput in the system peak week less than 2,000 GJ:

- Individual Offtake Point throughput in the system peak week.
- Total throughput in the system peak week.
- Average throughput in the system peak week.

## **6. CRITICAL POINTS OF TRANSMISSION SYSTEMS**

(Ref. Schedule 1 Part 5, Clause 6)

Table 6.1 shows the following information in relation to each Offtake Point with a throughput in the system peak week greater than 2,000 GJ:

- The factor by which the throughput of the Offtake Point (keeping all others the same) could have been increased in the system peak week assuming no capital expenditure to increase the system's capacity.
- The critical point or section of the pipeline, which provides the (first) constraint on increased throughput at the Offtake Point in the system peak week.
- A brief description of possible means to remove the (first) constraint.
- A reasonable estimate of the increase in throughput at the Offtake Point (keeping all others the same) with the (first) constraint removed.
- An estimate of the capital cost to remove the (first) constraint.





**Table 6.1 Maui Pipeline: Critical Points Limiting Throughput**

Ref. Schedule 1 Part 5, Clause 6 (2) (a) (b) and (c)

**SYSTEM PEAK WEEK: Week Ending 1 August 2010**

OFFTAKE POINTS	INCREASE WITH NO CAPEX		CRITICAL POINTS LIMITING THROUGHPUT	MEANS TO REMOVE LIMITATION	INDICATIVE CAPITAL COST	INCREASE (Limit removed)	
	(Factor)	(GJ)				(Factor) <sub>3</sub>	(GJ)
Rotowaro	1.058	71,914	Mokau compressor station	Upgrade Mokau compressor station <sup>1</sup>	15,000	1.61	756,341
Frankley Rd	13.5	2,904,100	Oaonui to Okato pipeline	Loop Oaonui to Okato MLV <sup>2</sup>	40,090	18.5	4,065,740
Bertrand Rd	20.7	2,172,674	Oaonui to Okato pipeline	Loop Oaonui to Okato MLV <sup>2</sup>	40,090	23.42	2,472,657
Pokuru	2.00	67,664	Mokau compressor station	Upgrade Mokau compressor station <sup>1</sup>	15,000	8.80	527,779
Huntly Power Station	1.08	72,186	Mokau compressor station	Upgrade Mokau compressor station <sup>1</sup>	15,000	1.49	426,160
Pirongia	13.2	71,253	Mokau compressor station	Upgrade Mokau compressor station <sup>1</sup>	15,000	64.0	367,946
Ngatimaru Rd (delivery)	6.95	2,740,076	Oaonui to Okato pipeline	Loop Oaonui to Okato MLV <sup>2</sup>	40,090	8.40	3,407,826

Notes: 1. Upgrade of Mokau compressor station is based on the addition of a 3MW compressor unit.

2. Analysis of looping capital cost was based on duplication of the existing laterals.

3. These increase factors are with respect to the Oaonui intake point as it is the most distant supply.

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## 7. METHODOLOGIES

(Ref. Schedule 1 Part 5, Clause 7)

### Intake Points

The actual flow rates in the system peak week for all five intake points were used in the modelling. When determining the numerical factor of throughput increasing with Oaonui intake point, Oaonui supply pressure was fixed at 46barg, and flows for Tikorangi, Tikorangi #2, Ngatimaru Rd (receipt), and Turangi Mixing Station were fixed to their system peak week actual flow. When determining the numerical factor of throughput increasing with every other intake points in turn, similar approach was taken.

### Offtake Points

Information disclosed herein as required by Clause 4 (4) of the Regulations was determined as set out below.

#### **Peak Week Dates(Ref. Clause 4 (4) (a))**

##### For the System

Hourly throughputs at all Offtake Points for the year were assembled into a spreadsheet. The week (ie from 00:00 hours on Monday to 24:00 on Sunday) in which the maximum total throughput of *all Offtake Points* on the system occurred (the "system peak week") was found to be the week ending 1 August 2010.

Notes: MDL does not have its own meters at every Offtake Point. In assembling the daily throughputs referred to above, data from meters owned by other parties was used. These parties' meters are not all located at the precise *physical* offtake point on the Maui pipeline.

For example, at the 3 major Offtake Points supplying Vector (Frankley Rd, Pokuru and Rotowaro) Vector has "check meters" to measure the gas entering its own pipelines at those points.

Likewise, MDL has no meter at the Bertrand Rd Offtake Point. Daily throughputs were calculated by aggregating the throughputs of the two meter stations owned by Methanex downstream of Bertrand Rd.

##### For Offtake Points

###### *SCADA Sites*

Vector, as MDL's Operator for the Maui pipeline, uses its SCADA (supervisory, control and data acquisition) system to monitor some of the major Offtake Points on the system.

For these sites, hourly data was retrieved from the SCADA system and used to determine the date of each Offtake Point's individual peak week.

###### *Non-SCADA Sites*

These are all Vector-owned Delivery Points. For these sites hourly throughput data was obtained from Vector's energy calculation system. The dates of the individual peak weeks for these Offtake Points were determined as described above.

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## Peak Week Throughput

(Ref. Clause 4 (4) (b))

### For the System

The throughput in the system peak week was determined from the spreadsheet of hourly throughputs used to determine the system peak week referred to above.

### For Offtake Points

For Offtake Points the individual peak week throughputs were obtained from the spreadsheet of hourly throughputs used to determine the system peak week referred to above.

## Throughput Increase in System Peak Week

(Ref. Clause 4 (4) (c))

The factor by which the throughput at each Offtake Point could have been increased in the system peak week was determined using Vector's Unsteady State Flow Model (as defined below (the "Model")). In accordance with the requirements of the Regulations this was done (i) assuming no capital investment to increase throughput and (ii) no change to throughput at each other Offtake Point on the system.

- Using data from SCADA or Vector's energy calculation system as applicable, flow rates (in standard m<sup>3</sup>/s) were calculated for each hour of the system peak week for each Offtake Point. The data was assembled into "flow profiles" of the form required by the Model and loaded into the Model.
- Modelling was based on a constant pressure of 46 barg at the Oaonui Production Station for fixed flow rate of other intake points scenario, the same approach was taken every other intake points pressure scenarios. The ability of the Maui gas field or every intake point to supply any increased throughput were beyond the scope of this report and were not considered. All intake points were in effect treated as a gas source of unlimited capacity.
- The Model was first run with actual loads in the system peak week to generate appropriate starting conditions for subsequent simulations.
- An Offtake Point was selected and a factor applied to its flow profile. This factor affected only the flow rates for the chosen Offtake Point.
- Only one compressor at the Mokau compressor station was running during simulations. This reflects current operating practice, where one unit runs and another is used as backup. The compressor used in the modelling was a theoretical compressor, which has 3000kW power, 56barg maximum discharge pressure and 95scms maximum flow throughput capacity (please note this was 73scms last year).
- Each simulation continued until it became evident either that the increased load was unsustainable or conversely a larger factor could be accommodated. A new factor was selected and the simulation repeated. This process was continued until the minimum acceptable pressure at the critical point or points on the system (see below) was determined. To ensure system stability, two runs at maximum scaling factor were simulated with the first week providing the initial conditions for the second week. This procedure provides a more realistic scenario and avoids overstating the maximum scaling factor.
- The above process was applied in turn to all Offtake Points on the system with a

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throughput greater than 2,000 GJ in the Offtake Points' peak week.

- The Model is set up to simulate only the pipeline (including laterals) and the Mokau compressor station. Offtake Points are not modelled. Simulating flow through the filter-separator, valves, pipework and meter tubes of complex Offtake Points would result in an unwarranted increase in complexity and simulation running time. Consequently, no account was taken of the ability of existing Offtake Points to handle increased throughput. Generally speaking, upgrading an Offtake Point to handle increased flow would be much less difficult and costly than upgrading the pipeline to deliver the increased flow.
- Under the Maui Pipeline Operating Code ("MPOC"), MDL is required to maintain minimum pressure of 32 bar g. The criterion applied to assess the sustainability of increased throughput was whether the pipeline pressure at each Offtake Point remained above 32 bar g.
- No account was taken of the *rate* of pressure decay to the minimum acceptable value or the amplitude of pressure variations at any point. No explicit operational headroom margins were included in any simulation.

### **Further Disclosure Relating to Pipeline System**

(Ref. Clause 5)

Throughputs for Offtake Points with a throughput less than 2,000 GJ in the system peak week were determined in the same way as those for Offtake Points with throughputs greater than 2,000 GJ (see above).

### **Critical Points of Pipeline System**

(Ref. Clause 6 (2))

During modelling of the pipeline pursuant to Clause 4 (4) (c) of the Regulations the point at which the minimum acceptable pipeline pressure was first reached, thereby limiting any further increase in throughput, was noted for each Offtake Point.

Potential system reinforcement options capable of removing the first constraint on increased throughput at each Offtake Point were identified. Further simulations were carried out to find the increased throughput possible in each case. The results are set out in Table 6.1.

Note that with the exception of those at the Huntly power station, all Offtake Points with a throughput greater than 2,000 GJ per week supply pipelines owned by parties other than MDL. The ability of those parties' pipelines to accept the increased throughput was beyond the scope of this report and was not considered.

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Table 6.1 also contains an estimate of the cost of each method of removing the constraint affecting each Offtake Point. These estimates were developed using average construction rates, historical cost data, independent reports and applicable cost indexes for pipelines, compressors and related facilities. They are based on conceptual desk top study only and should be considered indicative only.

### **Unsteady State Flow (Capacity Simulation) Model**

(Ref. Clause 7 (2))

Modelling (simulation) was carried out using Stoner SynerGee Gas, version 4.4.2, written by Advantica of the USA. The software is licensed to Vector.

A hard copy of the input data (flow profiles for each Offtake Point) is provided in Appendix 1 of this disclosure. This data is available on request, via email or on a CD ROM, in Microsoft Excel spreadsheet format.

## **8. GAS HELD OR RESERVED IN TRANSMISSION SYSTEMS**

(Ref. Schedule 1 Part 5, Clause 8)

Pursuant to regulation 29 clause 5, MDL is not required to disclose any information with respect to clause 8 of Part 5 of Schedule 1.

## APPENDIX 1

### FLOW PROFILES

Note: The peak weekly flow profile (in standard m<sup>3</sup>/s) for each Offtake Point is shown in the following tables. These weekly loads were calculated by multiplying hourly flow rates by a typical CV.

The resulting values may therefore differ somewhat from those shown in Tables 4.1.1 – Table 4.1.5, which were determined using daily average CV's.

Rounding of flow rates to two decimal places may also have contributed slight differences.

Bertrand Rd DP

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		4.28	5.53	5.49	4.16	3.45	4.13
1	4.09	5.58	5.66	4.81	4.07	3.94	4.23
2	4.14	5.66	5.59	4.24	4.04	4.00	4.28
3	4.18	5.67	5.56	4.33	4.04	4.04	4.27
4	4.27	5.62	5.57	4.20	4.07	4.07	4.27
5	4.35	5.63	5.59	4.19	4.09	4.07	4.26
6	4.22	5.63	5.61	4.17	4.09	4.06	4.12
7	4.19	5.64	5.61	4.16	4.08	4.08	4.16
8	4.20	5.62	5.61	4.17	4.05	4.08	4.14
9	4.15	5.70	5.56	4.11	4.03	4.05	4.11
10	4.11	5.62	5.61	4.11	5.30	4.11	4.09
11	4.15	5.64	5.68	4.08	9.23	4.05	4.09
12	4.11	5.64	5.71	3.86	9.21	4.05	4.06
13	4.06	5.66	5.54	3.88	9.24	3.97	4.04
14	4.06	5.70	5.29	3.89	9.14	4.06	4.07
15	4.10	5.63	5.33	3.94	3.53	4.07	4.14
16	4.01	5.63	5.57	3.77	2.76	4.11	4.14
17	3.94	5.67	5.57	4.00	2.80	4.10	4.16
18	3.92	5.65	5.70	4.26	3.02	4.09	4.16
19	3.89	5.61	6.02	4.17	2.78	4.08	4.14
20	3.91	5.54	5.75	4.18	3.01	4.07	4.13
21	3.92	5.52	5.56	4.17	3.39	4.08	4.12
22	3.88	5.53	5.49	4.18	3.44	4.05	4.09
23	3.90	5.52	5.44	4.21	3.51	4.07	4.10



Frankley Road DP

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		8.74	10.23	5.57	7.73	13.42	4.65
1	5.42	8.85	11.42	4.60	7.45	10.37	3.83
2	5.05	8.27	12.90	7.82	8.19	10.04	2.87
3	4.57	6.64	13.15	9.43	8.97	9.60	3.06
4	5.90	5.55	13.41	8.79	9.53	9.40	4.73
5	8.18	5.18	13.51	8.75	10.63	9.71	5.14
6	7.62	7.41	13.61	8.77	11.08	9.37	5.21
7	7.83	8.65	13.93	8.78	11.88	10.18	5.58
8	8.19	9.21	14.14	10.31	15.38	13.68	6.96
9	8.13	9.06	14.05	9.52	15.88	14.45	9.14
10	7.41	8.41	13.49	9.68	15.34	11.74	10.86
11	5.58	7.24	13.41	8.88	14.62	9.09	10.81
12	8.72	7.38	13.25	8.58	14.77	9.19	10.55
13	10.59	7.53	13.02	8.53	13.86	7.88	10.05
14	9.59	7.91	9.78	8.01	12.79	8.28	10.13
15	4.57	9.10	9.78	8.22	13.54	6.56	11.96
16	4.52	8.51	15.75	6.48	13.80	6.50	12.31
17	10.53	8.23	15.49	4.77	13.12	6.91	12.42
18	11.01	7.01	14.12	11.12	12.37	8.85	12.16
19	11.52	6.92	13.99	11.20	13.40	9.15	11.25
20	11.88	6.23	14.33	11.00	12.99	8.81	10.66
21	12.42	6.10	13.92	10.65	12.94	8.76	10.59
22	12.64	7.10	13.01	7.64	12.88	8.61	9.85
23	10.88	9.01	9.09	5.78	12.91	6.77	9.40

Huntly Power Station

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		33.74	29.32	35.88	27.65	33.17	30.56
1	30.99	27.12	29.09	34.80	29.41	34.19	32.61
2	25.65	25.17	27.36	30.51	27.73	32.60	27.06
3	22.94	25.15	26.30	29.63	26.90	29.68	23.78
4	23.99	24.40	25.62	30.38	25.97	29.20	23.01
5	26.77	25.41	27.93	31.35	26.49	28.76	23.01
6	28.40	28.06	29.36	36.08	30.17	28.44	25.38
7	34.16	40.58	28.90	45.47	28.47	32.33	29.95
8	43.50	41.76	38.46	43.22	32.59	38.54	38.02
9	42.90	43.95	38.70	31.00	36.49	42.37	40.09
10	40.64	39.11	37.54	29.86	38.73	41.64	42.76
11	42.94	37.95	37.64	35.75	41.89	40.87	40.41
12	43.45	37.78	37.60	34.63	42.02	39.40	40.53
13	37.66	37.84	36.61	35.59	41.36	39.74	39.39
14	38.31	42.50	36.24	37.80	40.04	38.82	38.04
15	36.00	41.63	37.88	38.37	39.87	38.76	37.14
16	36.59	34.00	38.24	40.31	39.90	36.26	33.58
17	37.53	34.93	40.13	41.34	42.11	35.53	30.51
18	39.89	36.26	42.46	37.84	41.10	45.74	35.67
19	42.88	41.60	43.73	38.33	36.88	50.36	37.32
20	44.18	39.70	41.66	36.74	34.27	49.70	35.27
21	45.74	39.36	42.14	35.13	34.70	44.55	33.44
22	38.73	35.76	42.39	31.09	35.56	36.66	33.04
23	33.96	33.12	38.99	31.57	38.12	32.63	29.40





Huntly Town DP

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		0.01	0.01	0.02	0.02	0.05	0.08
1	0.08	0.03	0.03	0.02	0.03	0.05	0.09
2	0.08	0.02	0.02	0.02	0.02	0.05	0.08
3	0.09	0.03	0.03	0.03	0.03	0.06	0.09
4	0.09	0.03	0.03	0.03	0.03	0.07	0.09
5	0.09	0.03	0.03	0.03	0.03	0.06	0.08
6	0.08	0.03	0.03	0.03	0.03	0.07	0.07
7	0.09	0.03	0.03	0.03	0.04	0.08	0.08
8	0.09	0.05	0.04	0.04	0.04	0.09	0.08
9	0.09	0.05	0.05	0.05	0.05	0.10	0.07
10	0.10	0.05	0.04	0.05	0.03	0.09	0.08
11	0.10	0.04	0.04	0.04	0.02	0.10	0.08
12	0.09	0.04	0.02	0.03	0.02	0.09	0.07
13	0.09	0.03	0.02	0.03	0.02	0.09	0.05
14	0.08	0.02	0.01	0.01	0.02	0.08	0.05
15	0.06	0.01	0.01	0.01	0.02	0.09	0.06
16	0.07	0.01	0.01	0.01	0.03	0.06	0.05
17	0.07	0.01	0.01	0.02	0.04	0.07	0.02
18	0.06	0.01	0.02	0.01	0.04	0.07	0.02
19	0.07	0.02	0.02	0.02	0.04	0.08	0.03
20	0.04	0.02	0.02	0.02	0.04	0.08	0.02
21	0.01	0.02	0.01	0.02	0.04	0.07	0.02
22	0.01	0.01	0.01	0.01	0.04	0.08	0.02
23	0.01	0.01	0.01	0.01	0.04	0.07	0.02

Ngaruawahia DP

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		0.00	0.00	0.00	0.00	0.00	0.01
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.01	0.01	0.01	0.01	0.01	0.01	0.00
8	0.01	0.01	0.01	0.01	0.01	0.01	0.00
9	0.01	0.01	0.01	0.01	0.01	0.01	0.01
10	0.01	0.01	0.01	0.01	0.01	0.01	0.01
11	0.01	0.01	0.00	0.00	0.01	0.01	0.01
12	0.01	0.00	0.01	0.00	0.00	0.01	0.01
13	0.00	0.00	0.00	0.01	0.00	0.00	0.01
14	0.00	0.00	0.00	0.00	0.00	0.00	0.01
15	0.00	0.00	0.00	0.01	0.00	0.01	0.01
16	0.00	0.01	0.00	0.00	0.00	0.01	0.01
17	0.01	0.01	0.00	0.01	0.01	0.01	0.01
18	0.01	0.01	0.01	0.01	0.01	0.01	0.01
19	0.01	0.02	0.01	0.01	0.01	0.01	0.01
20	0.01	0.01	0.01	0.01	0.01	0.01	0.01
21	0.01	0.01	0.01	0.01	0.02	0.01	0.01
22	0.01	0.01	0.01	0.01	0.01	0.01	0.00
23	0.00	0.00	0.00	0.00	0.01	0.01	0.00



Ngatimaru Rd  
(delivery)

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		18.34	18.34	18.32	18.33	18.32	18.38
1	18.33	18.34	18.36	18.37	18.34	18.30	18.39
2	18.34	18.35	18.35	18.38	18.34	18.34	18.41
3	18.33	18.36	18.34	18.36	18.34	18.32	18.41
4	18.35	18.34	18.35	18.35	18.33	18.33	18.40
5	18.36	18.35	18.35	18.36	18.34	18.33	18.39
6	18.30	18.36	18.36	18.34	18.34	18.32	18.39
7	18.32	18.34	18.34	18.36	18.33	18.33	18.41
8	18.30	18.37	18.34	18.34	18.32	18.33	18.40
9	18.31	18.37	18.33	18.33	18.32	18.31	18.39
10	18.31	18.36	18.33	18.32	18.30	18.33	18.39
11	18.34	18.39	18.35	18.34	18.30	18.36	18.43
12	18.35	18.36	18.40	18.40	18.32	18.40	18.35
13	18.39	18.38	18.37	18.36	18.35	18.39	18.36
14	18.36	18.45	18.30	18.37	18.34	18.39	18.33
15	18.33	18.34	18.39	18.38	18.37	18.39	18.37
16	18.36	18.39	18.47	18.31	18.37	18.39	18.34
17	18.35	18.38	18.39	18.35	18.36	18.40	18.38
18	18.34	18.36	18.36	18.38	18.38	18.40	18.36
19	18.33	18.36	18.34	18.36	18.36	18.38	18.41
20	18.33	18.33	18.33	18.37	18.34	18.37	18.38
21	18.35	18.34	18.34	18.36	18.34	18.38	18.37
22	18.33	18.36	18.33	18.35	18.32	18.39	18.36
23	18.33	18.35	18.30	18.35	18.33	18.37	18.38

Oakura DP

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		0.00	0.00	0.00	0.00	0.01	0.01
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.01	0.00	0.00	0.01	0.00	0.00
6	0.01	0.01	0.00	0.01	0.01	0.01	0.00
7	0.01	0.01	0.01	0.01	0.01	0.01	0.01
8	0.02	0.02	0.02	0.02	0.02	0.01	0.01
9	0.02	0.01	0.01	0.01	0.01	0.01	0.01
10	0.01	0.01	0.01	0.01	0.01	0.01	0.01
11	0.01	0.01	0.00	0.01	0.00	0.01	0.01
12	0.00	0.01	0.00	0.00	0.00	0.01	0.01
13	0.01	0.00	0.00	0.00	0.00	0.01	0.02
14	0.00	0.01	0.00	0.00	0.00	0.00	0.01
15	0.00	0.00	0.00	0.00	0.00	0.01	0.01
16	0.00	0.01	0.00	0.00	0.00	0.00	0.01
17	0.01	0.01	0.01	0.00	0.00	0.01	0.01
18	0.01	0.02	0.01	0.01	0.01	0.01	0.01
19	0.02	0.02	0.02	0.02	0.01	0.01	0.02
20	0.02	0.02	0.02	0.01	0.01	0.01	0.01
21	0.02	0.02	0.02	0.01	0.01	0.01	0.01
22	0.01	0.01	0.01	0.01	0.01	0.01	0.01
23	0.01	0.01	0.01	0.01	0.01	0.01	0.01



Okato DP

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.01	0.01	0.01	0.01	0.01	0.00	0.00
9	0.01	0.01	0.01	0.01	0.01	0.01	0.00
10	0.01	0.01	0.01	0.01	0.01	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.01
18	0.01	0.01	0.00	0.00	0.00	0.00	0.00
19	0.01	0.00	0.01	0.00	0.00	0.00	0.00
20	0.00	0.01	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.01	0.01	0.00	0.01	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Opunake DP

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		0.00	0.01	0.01	0.01	0.01	0.01
1	0.00	0.01	0.00	0.00	0.00	0.00	0.01
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.01
4	0.01	0.00	0.01	0.00	0.00	0.00	0.00
5	0.01	0.00	0.00	0.01	0.00	0.00	0.00
6	0.01	0.01	0.00	0.00	0.01	0.00	0.00
7	0.01	0.01	0.01	0.01	0.01	0.01	0.00
8	0.03	0.02	0.02	0.02	0.02	0.01	0.01
9	0.03	0.02	0.02	0.02	0.02	0.01	0.01
10	0.02	0.01	0.02	0.01	0.01	0.01	0.01
11	0.01	0.01	0.01	0.01	0.01	0.01	0.01
12	0.01	0.01	0.01	0.01	0.01	0.01	0.01
13	0.01	0.01	0.01	0.01	0.00	0.01	0.01
14	0.01	0.01	0.01	0.00	0.00	0.01	0.01
15	0.01	0.01	0.01	0.01	0.00	0.00	0.01
16	0.01	0.01	0.01	0.00	0.00	0.01	0.01
17	0.01	0.01	0.01	0.01	0.01	0.01	0.01
18	0.02	0.02	0.01	0.01	0.01	0.01	0.01
19	0.02	0.02	0.01	0.01	0.01	0.01	0.02
20	0.01	0.02	0.01	0.01	0.01	0.01	0.01
21	0.01	0.01	0.01	0.01	0.01	0.01	0.01
22	0.01	0.01	0.01	0.01	0.01	0.01	0.01
23	0.01	0.01	0.01	0.00	0.00	0.01	0.00

Otorohanga DP

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		0.01	0.01	0.01	0.01	0.01	0.01
1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
2	0.01	0.01	0.01	0.01	0.01	0.01	0.01
3	0.01	0.01	0.01	0.01	0.01	0.01	0.01
4	0.01	0.01	0.01	0.01	0.01	0.01	0.01
5	0.01	0.01	0.01	0.01	0.01	0.01	0.00
6	0.01	0.01	0.01	0.01	0.01	0.01	0.00
7	0.02	0.02	0.03	0.02	0.03	0.01	0.01
8	0.04	0.04	0.04	0.04	0.04	0.01	0.01
9	0.04	0.03	0.04	0.03	0.04	0.02	0.01
10	0.04	0.03	0.03	0.03	0.03	0.02	0.01
11	0.03	0.02	0.02	0.02	0.02	0.02	0.01
12	0.03	0.02	0.01	0.02	0.02	0.01	0.01
13	0.02	0.02	0.01	0.02	0.01	0.01	0.02
14	0.01	0.01	0.01	0.02	0.02	0.01	0.02
15	0.01	0.01	0.01	0.02	0.01	0.01	0.02
16	0.01	0.02	0.01	0.02	0.02	0.01	0.02
17	0.02	0.02	0.02	0.02	0.02	0.01	0.02
18	0.02	0.02	0.02	0.02	0.02	0.02	0.02
19	0.02	0.02	0.02	0.03	0.02	0.02	0.02
20	0.02	0.02	0.02	0.03	0.02	0.02	0.02
21	0.02	0.02	0.02	0.02	0.02	0.02	0.02
22	0.01	0.02	0.02	0.02	0.02	0.01	0.01
23	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Pirongia

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.01	0.04	0.00	0.00
6	0.05	0.07	0.06	0.04	0.30	0.16	0.14
7	0.28	0.30	0.25	0.03	0.28	0.31	0.26
8	0.33	0.38	0.27	0.07	0.32	0.28	0.25
9	0.49	0.37	0.26	0.22	0.33	0.37	0.25
10	0.41	0.41	0.34	0.33	0.26	0.37	0.26
11	0.47	0.61	0.41	0.37	0.25	0.39	0.31
12	0.54	0.55	0.41	0.35	0.32	0.43	0.30
13	0.40	0.61	0.44	0.31	0.42	0.49	0.26
14	0.39	0.63	0.51	0.31	0.45	0.50	0.28
15	0.40	0.63	0.51	0.33	0.47	0.49	0.29
16	0.39	0.54	0.50	0.33	0.49	0.51	0.27
17	0.37	0.47	0.39	0.25	0.40	0.53	0.26
18	0.31	0.37	0.37	0.28	0.40	0.57	0.27
19	0.32	0.06	0.25	0.25	0.30	0.54	0.29
20	0.34	0.08	0.24	0.19	0.26	0.54	0.29
21	0.33	0.05	0.24	0.07	0.33	0.45	0.28
22	0.32	0.01	0.12	0.01	0.32	0.25	0.26
23	0.16	0.00	0.00	0.00	0.29	0.00	0.24

Pokuru DP

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		4.92	2.58	3.85	1.79	3.01	2.67
1	2.20	3.70	2.14	6.53	2.34	2.96	2.24
2	1.17	1.93	1.82	6.39	2.05	2.74	1.93
3	0.40	1.80	1.22	4.38	1.81	2.80	2.56
4	0.35	1.65	1.30	3.94	1.64	2.31	2.42
5	0.20	1.54	1.62	2.63	1.56	2.08	1.89
6	0.31	1.61	1.78	2.10	1.67	1.84	1.55
7	0.71	1.92	1.74	2.01	1.99	1.76	1.59
8	1.49	2.60	2.23	2.54	3.13	1.85	1.66
9	2.33	3.01	2.71	2.99	3.79	2.39	1.76
10	3.18	2.91	3.49	3.14	3.45	1.82	1.98
11	6.05	3.08	4.19	3.70	2.84	1.43	1.78
12	5.95	2.87	5.03	3.27	2.77	1.32	1.96
13	5.73	2.34	4.56	3.24	2.48	1.15	2.18
14	6.21	2.65	4.86	2.24	2.20	1.18	2.28
15	6.21	2.42	4.35	1.63	1.89	1.95	2.49
16	6.01	2.36	3.93	0.76	1.57	2.72	2.57
17	6.14	2.59	3.91	1.18	0.98	2.75	2.46
18	6.28	2.90	3.96	1.77	1.00	2.98	2.39
19	6.15	3.06	4.07	2.20	1.38	3.09	2.56
20	6.53	3.35	4.10	2.65	1.57	3.26	2.84
21	6.38	3.28	4.32	2.57	0.71	3.36	2.87
22	5.95	3.11	4.23	2.41	0.49	3.21	2.75
23	5.44	2.92	4.10	2.22	1.03	3.00	2.52

Rotowaro DP

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		53.31	56.12	56.17	57.28	53.18	43.56
1	45.61	45.63	52.83	53.56	51.23	49.89	37.79
2	43.41	41.12	46.64	47.09	46.46	45.67	35.37
3	42.62	38.50	47.35	43.09	43.11	43.20	34.09
4	41.37	37.20	43.50	41.48	41.97	42.42	33.26
5	40.46	36.74	43.67	41.30	41.66	41.95	32.25
6	41.03	38.09	42.69	41.82	43.10	41.78	32.42
7	44.70	44.02	38.91	45.29	47.11	43.73	33.28
8	49.98	50.63	54.70	47.52	53.31	47.49	36.23
9	55.66	56.72	56.61	50.01	56.50	52.28	41.43
10	57.34	58.65	56.32	55.54	56.42	53.44	45.49
11	58.27	58.44	55.61	59.75	56.00	52.56	46.10
12	59.24	57.68	54.58	58.37	55.37	51.79	46.52
13	57.98	57.31	54.46	57.45	54.84	50.84	46.42
14	56.40	56.45	53.96	56.94	64.06	49.19	46.67
15	55.28	55.91	53.38	56.58	60.05	46.38	47.64
16	54.65	56.56	52.27	56.16	57.69	45.19	48.92
17	54.75	56.37	51.99	57.44	55.43	45.30	48.70
18	55.61	56.16	56.81	58.74	51.27	47.03	49.12
19	57.18	56.16	60.80	58.40	51.72	50.14	50.32
20	56.87	56.44	59.37	58.27	53.06	50.70	51.71
21	56.37	56.51	57.86	58.44	56.02	51.03	51.56
22	56.38	56.52	57.48	58.65	63.21	51.13	51.20
23	56.26	56.46	56.61	58.48	60.65	50.63	46.90



Te Kuiti North

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		0.03	0.01	0.03	0.01	0.03	0.01
1	0.01	0.03	0.01	0.04	0.01	0.03	0.01
2	0.01	0.02	0.01	0.04	0.01	0.02	0.01
3	0.01	0.02	0.01	0.04	0.01	0.01	0.01
4	0.01	0.02	0.01	0.04	0.01	0.03	0.01
5	0.01	0.03	0.01	0.04	0.01	0.03	0.01
6	0.01	0.03	0.01	0.05	0.01	0.03	0.01
7	0.02	0.04	0.02	0.05	0.02	0.03	0.01
8	0.04	0.05	0.04	0.05	0.04	0.03	0.02
9	0.04	0.05	0.04	0.04	0.04	0.02	0.02
10	0.03	0.04	0.02	0.06	0.03	0.02	0.02
11	0.02	0.04	0.02	0.05	0.02	0.02	0.02
12	0.03	0.04	0.03	0.05	0.02	0.02	0.02
13	0.03	0.03	0.05	0.04	0.02	0.01	0.02
14	0.01	0.02	0.05	0.04	0.02	0.02	0.02
15	0.02	0.02	0.05	0.04	0.02	0.01	0.02
16	0.03	0.02	0.04	0.02	0.02	0.02	0.02
17	0.03	0.02	0.05	0.02	0.02	0.02	0.02
18	0.03	0.02	0.05	0.02	0.02	0.02	0.02
19	0.04	0.02	0.06	0.02	0.04	0.02	0.02
20	0.04	0.02	0.05	0.02	0.04	0.02	0.02
21	0.04	0.02	0.04	0.02	0.04	0.02	0.02
22	0.03	0.02	0.04	0.02	0.04	0.02	0.01
23	0.03	0.02	0.05	0.02	0.04	0.02	0.01

Te Kuiti South DP

Hour	26/07/2010	27/07/2010	28/07/2010	29/07/2010	30/07/2010	31/07/2010	1/08/2010
0		0.03	0.05	0.07	0.07	0.03	0.03
1	0.02	0.03	0.05	0.06	0.08	0.03	0.03
2	0.01	0.01	0.05	0.06	0.04	0.01	0.02
3	0.00	0.01	0.03	0.02	0.03	0.01	0.01
4	0.01	0.02	0.05	0.01	0.04	0.02	0.02
5	0.01	0.01	0.05	0.03	0.03	0.02	0.02
6	0.01	0.02	0.03	0.02	0.02	0.01	0.01
7	0.01	0.04	0.03	0.03	0.01	0.01	0.01
8	0.01	0.04	0.04	0.04	0.01	0.02	0.02
9	0.01	0.03	0.03	0.04	0.01	0.01	0.01
10	0.00	0.03	0.02	0.03	0.01	0.01	0.01
11	0.00	0.03	0.03	0.03	0.00	0.01	0.01
12	0.00	0.02	0.03	0.03	0.00	0.01	0.01
13	0.00	0.02	0.06	0.02	0.01	0.01	0.01
14	0.02	0.06	0.05	0.04	0.02	0.02	0.02
15	0.02	0.05	0.04	0.04	0.03	0.02	0.02
16	0.03	0.05	0.04	0.04	0.03	0.03	0.03
17	0.04	0.05	0.06	0.05	0.03	0.03	0.03
18	0.03	0.05	0.06	0.06	0.03	0.03	0.03
19	0.03	0.05	0.05	0.05	0.03	0.03	0.03
20	0.03	0.05	0.06	0.05	0.03	0.03	0.03
21	0.03	0.05	0.06	0.06	0.04	0.03	0.03
22	0.03	0.04	0.05	0.05	0.04	0.03	0.03
23	0.03	0.05	0.06	0.06	0.04	0.03	0.03