

September 14, 2016

VIA HAND DELIVERY & ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

**RE: Docket 4634 - 2016 Distribution Adjustment Charge
Responses to Division Data Requests – Set 2**

Dear Ms. Massaro:

Enclosed please find 10 copies of National Grid's¹ responses to the second set of data requests issued by the Rhode Island Division of Public Utilities and Carriers (Division) in the above-referenced docket.

In accordance with PUC Rule 1.2(g) and by R.I. Gen. Laws § 38-2-2(4)(B), the Company is seeking protective treatment of the response to Division 2-2 and Attachment DIV 2-2, as well as the response to Division 2-3, as permitted by PUC Rule 1.2(g).

This filing also contains a Motion for Protective Treatment in accordance with PUC Rule 1.2(g) and R.I. Gen. Laws § 38-2-2(4)(B). In compliance with Rule 1.2(g), National Grid is providing one complete, unredacted copy of the confidential documents referenced above in a sealed envelope marked, **“Contains Privileged and Confidential Materials – Do Not Release.”**

Thank you for your attention to this filing. If you have any questions, please contact Jennifer Brooks Hutchinson at 401-784-7288 or Robert Humm at 401-784-7415.

Very truly yours,



Jennifer Brooks Hutchinson



Robert J. Humm

Enclosures

cc: Docket 4634 Service List
Leo Wold, Esq.
Steve Scialabba, Division
Bruce Oliver, Division

¹ The Narragansett Electric Company d/b/a National Grid (National Grid or the Company).

Certificate of Service

I hereby certify that a copy of the cover letter and any materials accompanying this certificate was electronically transmitted to the individuals listed below.

The paper copies of this filing are being hand delivered to the Rhode Island Public Utilities Commission and to the Rhode Island Division of Public Utilities and Carriers.



Joanne M. Scanlon

September 14, 2016
Date

**Docket No. 4634 – National Grid –2016 Annual Distribution Adjustment
Charge Filing (DAC) - Service List as of 8/22/16**

Name/Address	E-mail	Phone
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File an original & nine (9) copies w/: Luly E. Massaro, Commission Clerk	Luly.massaro@puc.ri.gov ;	401-780-2107
	Patricia.lucarelli@puc.ri.gov ;	

Public Utilities Commission 89 Jefferson Blvd. Warwick, RI 02888	Todd.bianco@puc.ri.gov ;	
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STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
RHODE ISLAND PUBLIC UTILITIES COMMISSION

National Grid Distribution Adjustment Charge (DAC) 2016)))))	Docket No. 4634
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THE NARRAGANSETT ELECTRIC COMPANY
d/b/a NATIONAL GRID’S MOTION FOR PROTECTIVE
TREATMENT OF CONFIDENTIAL INFORMATION

National Grid¹ hereby requests that the Rhode Island Public Utilities Commission (PUC) grant protection from public disclosure of certain confidential and proprietary information submitted in this proceeding, as permitted by Rule 1.2(g) of the PUC’s Rules and Regulations and R.I. Gen. Laws § 38-2-2(4)(B). National Grid also hereby requests that, pending entry of that finding, the PUC preliminarily grant National Grid’s request for confidential treatment pursuant to Rule 1.2(g)(2).

I. BACKGROUND

On September 14, 2016, National Grid filed with the PUC its responses to the Division of Public Utilities and Carriers’ (Division) second set of data requests in this docket. Division 2-2 and Division 2-3 request the names of customers being considered by National Grid for inclusion in the AGT program for the 2016-2017 and the 2017-2018 periods, respectively, and specific data concerning the AGT projects specific to each customer. National Grid is seeking protective treatment for the customer identifying

¹ The Narragansett Electric Company d/b/a National Grid (National Grid or the Company).

information contained in the responses to Division 2-2 and Division 2-3, and in Attachment DIV 2-2-d. For the reasons stated below, National Grid requests that this information be protected from public disclosure.

II. LEGAL STANDARD

Rule 1.2(g) of the PUC's Rules of Practice and Procedure provides that access to public records shall be granted in accordance with the Access to Public Records Act (APRA), R.I. Gen. Laws § 38-2-1, *et seq.* Under APRA, all documents and materials submitted in connection with the transaction of official business by an agency is deemed to be a "public record," unless the information contained in such documents and materials falls within one of the exceptions specifically identified in R.I. Gen. Laws § 38-2-2(4). To the extent that information provided to the PUC falls within one of the designated exceptions to the public records law, the PUC has the authority under the terms of APRA to deem such information confidential and to protect that information from public disclosure.

In that regard, R.I. Gen. Laws § 38-2-2(4)(B) provides that the following types of records shall not be deemed public:

Trade secrets and commercial or financial information obtained from a person, firm, or corporation which is of a privileged or confidential nature.

The Rhode Island Supreme Court has held that the determination as to whether this exemption applies requires the application of a two-pronged test set forth in *Providence Journal Company v. Convention Center Authority*, 774 A.2d 40 (R.I. 2001). The first prong of the test assesses whether the information was provided voluntarily to the governmental agency. *Providence Journal*, 774 A.2d at 47. If the answer to the first question is affirmative, then the question becomes whether the information is "of a kind

that would customarily not be released to the public by the person from whom it was obtained.” *Id.*

III. BASIS FOR CONFIDENTIALITY

The responses to Division 2-2 and Division 2-3, and Attachment DIV 2-2-d contain customer names and other sensitive information regarding rebates and other information specific to that customer’s AGT facility. Customer names and other identifying information is proprietary to those customers and the type of information that the Company has historically maintained as confidential when provided in PUC filings. Disclosure of this information would impact the competitive position of these customers in the context of the AGT program. Such disclosure would also impede on the privacy interests of those customers. Accordingly, National Grid seeks protection for the customer names included in the responses to Division 2-2 and Division 2-3, and Attachment DIV 2-2-d.

IV. CONCLUSION

For foregoing reasons, National Grid respectfully requests that the PUC grant its Motion for Protective Treatment.

Respectfully submitted,

**THE NARRAGANSETT ELECTRIC COMPANY
d/b/a NATIONAL GRID**

By its attorney,



Robert J. Humm, Esq. (#7920)
Jennifer Brooks Hutchinson (#6176)
National Grid
280 Melrose Street
Providence, RI 02907
(401) 784-7288
Dated: September 14, 2016

Division 2-1

Request:

Re: witness Nutile's Direct Testimony at page 6 of 22, please provide a list of each described AGT project during the 2015-2016 period and for each project indicate:

- a. The name of the customer (may be provided subject to confidentiality restrictions);
- b. The projected annual gas use volumes for the proposed facility;
- c. Description of the advanced technology utilized;
- d. The estimated amount of the rebate the Company would offer for the project and the basis for computing the estimated rebate;
- e. The estimated in-service date for the proposed facility;
- f. The anticipated schedule for payment of rebates;
- g. The estimated rebate amount per vehicle for the Natural Gas Vehicle project.

Response:

Other than Toray Plastics (America), Inc., described on page 6 of the Direct Testimony of Suhila Nouri Nutile, there were no other projects during the 2015-2016 period.

Redacted
Division 2-2

Request:

Re: witness Nutile's Direct Testimony at page 6 of 22, please provide a list of each proposed AGT project the Company has identified for the 2016-2017 period, and for each project indicate:

- a. The name of the customer (may be provided subject to confidentiality restrictions);
- b. The projected annual gas use volumes for the proposed facility;
- c. Description of the advanced technology to be utilized;
- d. The estimated amount of the rebate the Company would offer for the project and the basis for computing the estimated rebate;
- e. The estimated in-service date for the proposed facility;
- f. The anticipated schedule for payment of rebates.

Response:

- a. The names of the customers presently being considered by the Company for inclusion in the AGT program for the 2016-2017 period are shown in the table below. These are preliminary project considerations only.
- b. The projected annual gas use volumes (in therms) for the proposed facilities are listed below.

		1,178,168
		234,000

- c. The advanced technology to be utilized in both potential projects is a Combined Heat and Power System.

Redacted

Division 2-2, page 2

- d. The estimated amount of the rebate the Company would offer [REDACTED] is \$300,000, and the calculation for the rebate is provided in Attachment DIV 2-2-d. The rebate offered to [REDACTED] is not yet finalized, but is estimated to be in the range of \$25,000 to \$50,000. The rebate amounts are computed based on 75% of the net present value of the customer's estimate margin using the AGT screening tool.
- e. The estimated in-service date for both proposed facilities is December 2016.
- f. The anticipated schedule for payment of rebates for both proposed projects is July 2017.

MONTH	EXISTING LOAD (base case)	Generator Load	Thermal Offset	Increase in gas use	Proposed (both meters)	House Meter after CHP
January	59,834.80	89,370.40	46,045.90	40,291.80	100,126.50	10,756.10
February	54,235.30	80,833.50	41,647.00	36,443.40	90,678.80	9,845.30
March	59,893.90	89,449.50	46,080.70	40,333.00	100,226.90	10,777.40
April	58,385.60	85,784.60	44,228.80	38,646.90	97,032.50	11,247.90
May	59,922.30	88,437.20	45,616.20	39,823.50	99,745.90	11,308.70
June	58,033.50	86,702.20	44,663.80	39,095.80	97,129.30	10,427.10
July	60,245.90	89,581.50	46,147.80	40,393.40	100,639.30	11,057.80
August	59,922.30	89,536.90	46,128.40	40,369.90	100,292.20	10,755.30
September	58,033.50	84,558.70	43,673.00	38,023.70	96,057.30	11,498.60
October	60,245.90	88,340.40	45,511.00	39,831.40	100,077.30	11,736.90
November	57,833.00	85,428.60	44,012.60	38,516.80	96,349.80	10,921.20
December	60,174.40	88,111.50	45,490.70	39,637.30	99,811.70	11,700.20
TOTALS	706,760.40	1,046,135.00	539,245.90	471,406.90	1,178,167.50	132,032.50

*Note: All numbers are provided in therms.

Total Customer Bill		Firm Sales Service				
Rates Eff. May 1, 2015		Customer Charge (Monthly)	Demand Rate (MADO therms)	Distribution Charges		GCR
				Head Block (Th)	Tail Block (Th)	Demand (MADO therms)
						Variable (Th)
1	SMALL LOW LOAD FACTOR	\$ 22.00	\$ -	\$ 0.3721	\$ 0.2600	\$ -
2	SMALL HIGH LOAD FACTOR	\$ 22.00	\$ -	\$ 0.3721	\$ 0.2600	\$ -
3	MEDIUM LOW LOAD FACTOR	\$ 70.00	\$ 1.3000	\$ 0.1715	\$ -	\$ -
4	MEDIUM HIGH LOAD FACTOR	\$ 70.00	\$ 1.3000	\$ 0.1715	\$ -	\$ -
5	LARGE LOW LOAD FACTOR	\$ 175.00	\$ 1.3000	\$ 0.1695	\$ -	\$ -
6	LARGE HIGH LOAD FACTOR	\$ 175.00	\$ 1.8000	\$ 0.0964	\$ -	\$ -
7	EXTRA LARGE LOW LOAD FACTOR	\$ 425.00	\$ 1.3000	\$ 0.0348	\$ -	\$ -
8	EXTRA LARGE HIGH LOAD FACTOR	\$ 425.00	\$ 1.8000	\$ 0.0256	\$ -	\$ -

Calculation of Current Bill for Base Case (Before CHP)									
MADQ-Current (Ccf)		1,946	Customer Charge	Demand	Distribution Charges			GCR	TOTAL BILL
Month	Current (Th)		(1 meter)		M, L, XL	Small Low	Small High		
31	Jan	59,835	\$ 425	\$ 3,503	\$ 1,532	-	-	\$ 0	\$ 5,460
28	Feb	54,235	\$ 425	\$ 3,503	\$ 1,388	-	-	\$ 0	\$ 5,317
31	Mar	59,894	\$ 425	\$ 3,503	\$ 1,533	-	-	\$ 0	\$ 5,461
30	Apr	58,386	\$ 425	\$ 3,503	\$ 1,495	-	-	\$ 0	\$ 5,423
31	May	59,922	\$ 425	\$ 3,503	\$ 1,534	-	-	\$ 0	\$ 5,462
30	Jun	58,034	\$ 425	\$ 3,503	\$ 1,486	-	-	\$ 0	\$ 5,414
31	Jul	60,246	\$ 425	\$ 3,503	\$ 1,542	-	-	\$ 0	\$ 5,470
31	Aug	59,922	\$ 425	\$ 3,503	\$ 1,534	-	-	\$ 0	\$ 5,462
30	Sep	58,034	\$ 425	\$ 3,503	\$ 1,486	-	-	\$ 0	\$ 5,414
31	Oct	60,246	\$ 425	\$ 3,503	\$ 1,542	-	-	\$ 0	\$ 5,470
30	Nov	57,833	\$ 425	\$ 3,503	\$ 1,481	-	-	\$ 0	\$ 5,409
31	Dec	60,174	\$ 425	\$ 3,503	\$ 1,540	-	-	\$ 0	\$ 5,469
TOTAL		706,760	\$ 5,100	\$ 42,038	\$ 18,092	\$ 0	\$ 0	\$ 0	\$ 65,229

average charge / therm \$ 0.092

Off Peak=May-Oct 356,403
Off Peak / Total 50%

Calculation of Proposed Bill for House Meter after CHP (Base Case minus heat recovered)									
MADQ-Proposed (Ccf)		581	Customer Charge	Demand	Distribution Charges			GCR	TOTAL BILL
Month	Proposed (Th)				M, L, XL	Small Low	Small High		
31	Jan	17,012	\$ 425	\$ 1,045	\$ 436	-	-	\$ 0	\$ 1,906
28	Feb	15,504	\$ 425	\$ 1,045	\$ 397	-	-	\$ 0	\$ 1,867
31	Mar	17,039	\$ 425	\$ 1,045	\$ 436	-	-	\$ 0	\$ 1,906
30	Apr	17,253	\$ 425	\$ 1,045	\$ 442	-	-	\$ 0	\$ 1,912
31	May	17,499	\$ 425	\$ 1,045	\$ 448	-	-	\$ 0	\$ 1,918
30	Jun	16,496	\$ 425	\$ 1,045	\$ 422	-	-	\$ 0	\$ 1,892
31	Jul	17,328	\$ 425	\$ 1,045	\$ 444	-	-	\$ 0	\$ 1,914
31	Aug	17,023	\$ 425	\$ 1,045	\$ 436	-	-	\$ 0	\$ 1,906
30	Sep	17,418	\$ 425	\$ 1,045	\$ 446	-	-	\$ 0	\$ 1,916
31	Oct	17,921	\$ 425	\$ 1,045	\$ 459	-	-	\$ 0	\$ 1,929
30	Nov	16,901	\$ 425	\$ 1,045	\$ 433	-	-	\$ 0	\$ 1,903
31	Dec	17,868	\$ 425	\$ 1,045	\$ 457	-	-	\$ 0	\$ 1,927
TOTAL		205,262	\$ 5,100.00	\$ 12,540.68	\$ 5,254.70	0	0	0	22,895

average charge / therm \$ 0.112

Off Peak=May-Oct 103,685 Rate Classification 8 EXTRA LARGE HIGH LOAD FACTOR
 Off Peak / Total 51% Load Factor 1

Calculation of Proposed Bill for CHP Meter after Project is complete (CHP Only)									
MADQ-Proposed (Ccf)		2,688	Customer Charge	Demand	Distribution Charges			GCR	TOTAL BILL
Month	Proposed (Th)				M, L, XL	Small Low	Small High		
31	Jan	83,114	\$ 425	\$ 4,838	\$ 2,128	-	-	\$ 0	\$ 7,391
28	Feb	75,175	\$ 425	\$ 4,838	\$ 1,924	-	-	\$ 0	\$ 7,187
31	Mar	83,188	\$ 425	\$ 4,838	\$ 2,130	-	-	\$ 0	\$ 7,393
30	Apr	79,780	\$ 425	\$ 4,838	\$ 2,042	-	-	\$ 0	\$ 7,305
31	May	82,247	\$ 425	\$ 4,838	\$ 2,106	-	-	\$ 0	\$ 7,368
30	Jun	80,633	\$ 425	\$ 4,838	\$ 2,064	-	-	\$ 0	\$ 7,327
31	Jul	83,311	\$ 425	\$ 4,838	\$ 2,133	-	-	\$ 0	\$ 7,396
31	Aug	83,269	\$ 425	\$ 4,838	\$ 2,132	-	-	\$ 0	\$ 7,395
30	Sep	78,640	\$ 425	\$ 4,838	\$ 2,013	-	-	\$ 0	\$ 7,276
31	Oct	82,157	\$ 425	\$ 4,838	\$ 2,103	-	-	\$ 0	\$ 7,366
30	Nov	79,449	\$ 425	\$ 4,838	\$ 2,034	-	-	\$ 0	\$ 7,297
31	Dec	81,944	\$ 425	\$ 4,838	\$ 2,098	-	-	\$ 0	\$ 7,361
TOTAL		972,906	\$ 5,100.00	\$ 58,055.79	\$ 24,906.38	0	0	0	\$ 88,062

average charge / therm \$ 0.091

Off Peak=May-Oct 490,256 Rate Classification 8 EXTRA LARGE HIGH LOAD FACTOR
 Off Peak / Total 50% Load Factor 1

MARGIN GAIN FROM PROJECT \$ 45,728.18

		YEAR	
Cost of Capital 7.54%		1	\$ 20,000
		2	\$ 45,728
		3	\$ 45,728
		4	\$ 45,728
		5	\$ 45,728
		6	\$ 45,728
NPV 20 year life \$440,836.51		7	\$ 45,728
		8	\$ 45,728
75% of above		9	\$ 45,728
Less: Construction \$		10	\$ 45,728
Rebate from Margin Cal		11	\$ 45,728
		12	\$ 45,728
		13	\$ 45,728
		14	\$ 45,728
		15	\$ 45,728
		16	\$ 45,728
		17	\$ 45,728
		18	\$ 45,728
		19	\$ 45,728
		20	\$ 45,728

\$330,627.38
 \$ 18,274

\$312,353.38

Redacted
Division 2-3

Request:

Re: witness Nutile's Direct Testimony at pages 6 and 7 of 22, please provide a list of each project presently being considered by the Company for inclusion in the AGT program and provide:

- a. The name of the customer (may be provided subject to confidentiality restrictions);
- b. The projected annual gas use volumes for the proposed facility;
- c. The dollar amount of anticipated AGT funding for the project by year;
- d. Description of the advanced technology that would be utilized;
- e. Any workpapers, studies and analyses relied upon to support the Company's assessment of the proposed project.

Response:

- a. The names of the customers presently being considered by the Company for inclusion in the AGT program for the 2017-2018 period are [REDACTED], [REDACTED], [REDACTED], and [REDACTED].
- b. All customers are in the preliminary stages of consideration, so projected annual gas use volumes are not available at this time.
- c. All customers are in the preliminary stages of consideration, so dollar amounts of anticipated AGT funding are not available at this time.
- d. The advanced technology to be utilized in all of the potential projects is Combined Heat and Power System.
- e. No workpapers are available at this time, as all projects are in a preliminary screening phase. One eligibility requirement of the AGT program is that a customer's usage in the summer months of May through October be more than 31% of the annual usage. The Company is currently screening all of the customers' usage to determine if this criterion is met.

Division 2-4

Request:

Re: witness Nutile's Direct Testimony at pages 6 and 7 of 22, please provide a list of each project during the last three years that have applied for but been denied rebates under the AGT program including:

- a. The name of the customer (may be provided subject to confidentiality restrictions);
- a. The projected annual gas use volumes for the proposed facility;
- b. Description of the advanced technology that would be utilized;
- c. Reason for project denial;
- d. Requested Rebate amount.

Response:

During the last three years, there have been no projects which applied for but were denied rebates under the AGT program.

Division 2-5

Request:

Re: footnote 2 on page 9 of 22, please provide:

- a. The annually funded amounts for the LIHEAP program collected through surcharges for each of the last three years;
- b. The annually funded amounts estimated for 2016-2017 period for the LIHEAP program collected through surcharges.

Response:

- a. Attachment DIV 2-5-a provides the annually funded amounts for each of the last three years for both the LIHEAP enhancement program, which is funded through the per-customer monthly surcharge, and the Low Income Assistance Program (LIAP), which is funded through base rates. The amounts reflected for the LIHEAP enhancement program pertain only to funding provided by the Company's gas customers.
- b. Attachment DIV 2-5-b provides the annual estimate for funding during the 2016-2017 period for the LIHEAP enhancement program and the LIAP. The estimated funding for the LIHEAP enhancement program pertains only to funding provided by the Company's gas customers.

Actuals

Line No.

LIHEAP Enhancement Revenue

	October	November	December	January	February	March	April	May	June	July	August	September	Total
1 2013-2014	\$210,396	\$212,467	\$214,092	\$192,263	\$189,462	\$190,926	\$190,176	\$190,306	\$187,973	\$187,361	\$186,785	\$186,395	\$2,338,602
2 2014-2015	\$186,918	\$187,276	\$189,328	\$191,205	\$192,753	\$192,340	\$192,610	\$192,722	\$191,210	\$189,789	\$190,331	\$189,672	\$2,286,154
3 2015-2016	\$189,316	\$189,973	\$209,640	\$193,042	\$193,355	\$196,137	\$192,592	\$189,132	\$197,396				\$1,750,583

*Filed for the annual period of October through September.

LIAP - Base Rates Revenue

	April	May	June	July	August	September	October	November	December	January	February	March	Total
4 LIHEAP Factor	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444
Throughput (dth)													
5 2013-2014	4,486,226	2,151,794	1,354,405	1,331,548	1,273,742	1,325,817	1,431,941	2,423,071	4,898,381	6,641,379	6,839,764	6,238,261	40,396,327
6 2014-2015	4,747,568	2,399,405	1,431,004	1,066,704	1,149,307	1,077,241	1,648,721	2,250,721	4,855,391	6,111,192	8,279,403	6,710,893	41,727,549
7 2015-2016	4,940,618	2,297,118	1,530,785	1,283,863	1,245,791	1,242,933	1,399,012	2,429,157	3,960,645	4,878,358	6,194,802	5,211,058	36,614,142
Revenue													
8 2013-2014	\$199,188	\$95,540	\$60,136	\$59,121	\$56,554	\$58,866	\$63,578	\$107,584	\$217,488	\$294,877	\$303,686	\$276,979	\$1,793,597
9 2014-2015	\$210,792	\$106,534	\$63,537	\$47,362	\$51,029	\$47,829	\$73,203	\$99,932	\$215,579	\$271,337	\$367,605	\$297,964	\$1,852,703
10 2015-2016	\$219,363	\$101,992	\$67,967	\$57,004	\$55,313	\$55,186	\$62,116	\$107,855	\$175,853	\$216,599	\$275,049	\$231,371	\$1,625,668

*Based on the annual period ending March 31st.

- 1 LIHEAP Enhancement Plan Reconciliation Filed Oct 14 -Docket No. 4290
- 2 LIHEAP Enhancement Plan Reconciliation Filed Oct 15 -Docket No. 4290
- 3 LIHEAP Enhancement Plan Reconciliation Filed Jul 16 -Docket No. 4290
- 4 LIHEAP base rate factor, not including Low Income Weatherization. Approved \$1,585,000 funding divided by the rate year forecast (Feb 13-Jan 14) of 35,678,072 dth.
- 5 Apr 2013-Oct 2013 based on actual throughput as filed in November 2013 in Docket No. 4346; Nov 2013-March 2014 based on actual throughput filed in Nov 2013 in Docket No. 4436.
- 6 Apr 2014-Oct 2014 based on actual throughput as filed in November 2014 in Docket No. 4436; Nov 2014-March 2015 based on actual throughput filed in Jul 2015 in Docket No. 4520.
- 7 Apr 2015-Oct 2015 based on actual throughput as filed in November 2015 in Docket No. 4520; Nov 2015-Mar 2016 based on actual throughput filed in Jul 2016 in Docket No. 4576.
- 8 Line 4 * Line 5
- 9 Line 4 * Line 6
- 10 Line 4 * Line 7

Forecast

Line No.

LIHEAP Enhancement Revenue

	October	November	December	January	February	March	April	May	June	July	August	September	Total
2016-2017													
1 Customer count	259,401	260,695	262,902	265,155	266,525	267,153	266,684	265,706	264,180	262,625	261,602	261,080	3,163,708
2 Revenue	\$189,363	\$190,307	\$191,918	\$193,563	\$194,563	\$195,022	\$194,679	\$193,965	\$192,851	\$191,716	\$190,969	\$190,588	\$2,309,507

LIAP - Base Rates Revenue

	April	May	June	July	August	September	October	November	December	January	February	March	Total
2016-2017													
3 LIHEAP Factor	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444	\$0.0444
4 Forecast (dth)	4,192,466	2,727,108	1,654,559	1,183,267	1,114,668	1,187,152	1,775,267	3,170,430	4,836,440	6,122,746	6,268,349	5,473,140	39,705,393
5 Revenue	\$186,145	\$121,084	\$73,454	\$52,537	\$49,491	\$52,710	\$78,822	\$140,767	\$214,738	\$271,850	\$278,315	\$243,007	\$1,762,919

- 1 The Company forecast from the 2016-2017 Gas Cost Recovery filing.
- 2 Line 1 * \$0.73 (assumes a LIHEAP Enhancement surcharge of \$0.73 for Oct 16 - Sep 17).
- 3 Page 1, Line 4.
- 4 The Company forecast from the 2016-2017 Gas Cost Recovery filing.
- 5 Line 3 * Line 4.

Division 2-6

Request:

Re: footnote 2 on page 12 of 22, please:

- a. Provide the workpapers, data, calculations and documents relied upon to compute the updated On-System Margin threshold;
- b. Document any instances of similar customer migration from Non-Firm to Firm Transportation during the period April 1st, 2015 to March 31st, 2016. Including any workpapers and documents used to determine the number of customer migrations and the assessment of their impacts on the determination of the On-System Margin threshold.

Response:

- a. Schedule YC-6 from Docket No. 4514 and Schedule SLN-6 from Docket No. 4573 documented the adjustments to the On-System Margin threshold, as noted in footnote 2 on page 12 of 22 and are provided in Attachment DIV 2-6-a, pages 1 and 2 respectively.
- b. Customer migration from Non-Firm to Firm Transportation during the period April 1, 2015 to March 31, 2016 is provided in Attachment DIV 2-6-b. The electronic spreadsheet file of Schedule SLN-6, which fully documents the details of the migration, is provided as Attachment DIV 2-8.

National Grid - RI Gas
On-System Margin Threshold Adjustment
Docket 4514

Customers moving from Non-firm to Firm service per Settlement Agreement of Docket No. 4323

Line No.	(a) Assigned #	(b) Test year usage (therm)	(c) Distribution rate approved in Dkt 4323 (per therm)	(d) Calculated annual margin (b) * (c)
	<u>(i) July 2012 - January 2013</u>			
1	3	249,841	\$0.0912	\$22,786
2	21	800,376	\$0.0733	\$58,668
3	38	742,357	\$0.0912	\$67,703
4	Sub-total			\$149,156
	<u>(ii) February 2013 - March 2013</u>			
5	45	39,646	\$0.1436	\$5,693
6	Sub-total			\$5,693
	<u>(iii) April 2013 - March 2014</u>			
7	25	500,891	\$0.0733	\$36,715
8	33	18,144	\$0.2206	\$4,003
9	Sub-total			\$40,718
10	Total			\$195,567

Calculation of Adjustment to On-System Margin Theshold Approved in Docket No. 4323

	(e) Annual Non-firm Threshold per Dkt 4323	(f) Adjustment to Non-firm Threshold (d), line 10	(g) Adjusted Annual Non-firm Threshold (e) - (f)
11	\$1,800,000	\$195,567	\$1,604,433

National Grid - RI Gas
On-System Margin Threshold Adjustment
Docket 4573

Customers moving from Non-firm to Firm service per Settlement Agreement of Docket No. 4323

<u>Line No.</u>	(a) Assigned #	(b) Test year usage for Nov 2011-Mar 2011 (therm)	(c) Distribution rate approved in Dkt 4323 (per therm)	(d) Calculated annual margin (b) * (c)
	<u>April 2014 - March 2015</u>			
1	5	263,379	\$0.0733	\$19,306
2	15	671,609	\$0.0912	\$61,251
3	Total			\$80,556

Calculation of Adjustment to On-System Margin Threshold Approved in Docket No. 4323

	(e) Annual Non-firm Threshold per Dkt 4514	(f) Adjustment to Non-firm Threshold (d), line 3	(g) Adjusted Annual Non-firm Threshold (e) - (f)
4	\$1,604,433	\$80,556	\$1,523,876

Column (e), Line 4, per Docket No. 4514, YC-6S, page 3, Line 11.

Column (b), Customers 5 and 15 transferred to firm service as of November 2014.

National Grid - RI Gas
On-System Margin Threshold Adjustment

Customers moving from Non-firm to Firm service per Settlement Agreement of Docket No. 4323

<u>Line No.</u>	(a) Assigned #	(b) Test year usage for Apr 2011-Oct 2011 (therm)	(c) Distribution rate approved in Dkt 4323 (per therm)	(d) Calculated annual margin (b) * (c)
	<u>April 2015 - March 2016</u>			
1	5	529,774	\$0.0733	\$38,832
2	15	541,530	\$0.0912	\$49,388
3	Total			\$88,220

Calculation of Adjustment to On-System Margin Threshold Approved in Docket No. 4323

	(e) Annual Non-firm Threshold per Dkt 4573	(f) Adjustment to Non-firm Threshold (d), line 3	(g) Adjusted Annual Non-firm Threshold (e) - (f)
4	\$1,523,876	\$88,220	\$1,435,656

Column (b), Customers 5 and 15 transferred to firm service as of November 2014, their usage for Nov 2011-Mar 2011 was adjusted in Docket 4573, SLN-6, page 3.

Column (e), Line 4, per Docket 4573, SLN-6, page 3, Line 4, Column (g).

Division 2-7

Request:

Re: witness Nutile's Direct Testimony page 22 of 22, lines 8-11, please:

- a. Provide the detail of the forecast from which the referenced 39,347,340 dths of forecasted throughput;
- b. Provide actual throughput by month for the current DAC year and for each of the three immediately preceding DAC years.

Response:

- a. The detail of the forecast of the referenced 39,347,340 dths is provided in Attachment 2-7-a and has also been filed in the 2016-2017 Gas Cost Recovery filing in Docket No. 4647.
- b. The actual throughput by month for the current DAC year and for each of the three immediately preceding DAC years is provided in Attachment 2-7-b.

Forecasted Throughput

Line No.

	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Total Nov-Oct
1 Total THROUGHPUT	61,398	89,290	110,313	112,206	98,591	78,155	53,411	35,271	25,629	24,348	25,656	35,674	749,942
2 Residential Non-Heating	1,468,822	2,422,361	3,163,979	3,252,058	2,798,847	2,097,234	1,245,874	622,889	333,615	289,355	335,174	684,134	18,714,342
3 Residential Heating	174,414	330,132	451,453	466,152	391,675	276,157	136,161	33,921	2,491	2,243	2,511	43,678	2,310,988
4 Small C&I	455,215	701,951	890,573	910,903	793,576	614,469	395,543	234,724	158,138	147,199	159,385	250,580	5,712,259
5 Medium C&I	213,509	356,808	466,290	476,816	407,446	302,671	175,337	81,992	38,056	31,484	38,657	92,056	2,681,122
6 Large LLF	90,041	106,911	119,621	121,603	113,399	101,004	85,940	75,294	69,410	68,640	69,473	76,143	1,097,479
7 Large HLF	101,540	162,218	208,146	212,593	183,292	139,027	85,231	45,726	26,996	24,231	27,220	49,633	1,265,853
8 Extra Large LLF	560,270	598,755	627,612	630,434	611,840	583,749	549,611	524,542	528,931	527,168	529,074	543,369	6,815,355
9 Extra Large HLF	3,125,208	4,768,426	6,037,988	6,182,765	5,398,665	4,192,466	2,727,108	1,654,359	1,183,267	1,114,668	1,187,152	1,775,267	39,347,340
10 Total Throughput													

Source: 2016-2017 Gas Cost Recovery Filing Docket 4647

Actual Throughput

Line No.		Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Total Nov-Oct	
1	Total THROUGHPUT	52,939	103,262	141,802	141,832	138,940	103,094	65,116	37,167	29,077	27,531	27,601	33,761	902,122	
2	Residential Non-Heating	2,401	5,198	6,878	6,529	6,217	4,678	3,213	1,508	1,202	1,113	1,130	1,382	41,448	
3	Residential Non-Heating Low Income	969,814	2,219,000	3,163,797	3,145,750	3,050,687	2,122,865	1,108,093	513,737	372,360	344,157	355,647	438,073	17,803,980	
4	Residential Heating	99,566	219,809	302,587	289,373	283,752	210,481	123,623	57,730	44,605	41,177	41,359	48,984	1,763,045	
5	Residential Heating Low Income	115,595	324,268	517,511	521,961	496,004	313,467	141,840	58,923	44,241	41,469	43,864	56,088	2,675,230	
6	Small C&I	339,084	715,690	978,145	985,947	945,350	673,391	379,559	177,424	163,633	153,996	164,338	186,323	5,862,879	
7	Medium C&I	196,886	428,144	556,305	592,564	504,099	398,954	144,352	31,578	26,751	73,631	42,013	65,634	3,060,911	
8	Large LLF	101,997	101,893	109,799	211,968	120,561	88,497	87,495	78,183	70,014	92,182	76,632	76,920	1,216,140	
9	Large HLF	106,115	238,139	242,187	250,714	181,749	191,500	37,882	1,542	(14,385)	18,428	18,660	26,186	1,298,718	
10	Extra Large LLF	436,198	535,096	614,901	643,699	507,630	575,138	321,206	401,607	367,134	353,663	305,353	636,093	5,697,718	
11	Extra Large HLF	2,475	7,881	7,468	49,428	3,273	65,503	(12,974)	71,604	(37,929)	1,961	646	79,279	238,615	
12	Default	2,423,071	4,898,381	6,641,379	6,839,764	6,238,261	4,747,568	2,399,405	1,431,004	1,066,704	1,149,307	1,077,241	1,648,721	40,560,805	
13	Total Throughput	Source: GCR Deferred Filed November 2014 - Docket No. 4436 (Note Nov 13 Total Throughput should have been 2,423,071 dth as reported in GCR Annual Reconciliation Filing Filed July 14.)													

Line No.		Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Total Nov-Oct	
14	Total THROUGHPUT	56,635	74,913	97,349	123,153	116,760	83,622	45,364	29,503	23,827	21,194	20,827	24,491	717,638	
15	Residential Non-Heating	2,753	2,976	4,006	4,900	4,435	4,329	2,015	1,051	787	728	593	828	29,320	
16	Residential Non-Heating Low Income	954,909	2,132,202	2,877,504	3,747,011	3,449,650	2,298,799	1,005,002	502,341	400,977	346,347	343,276	450,190	18,508,206	
17	Residential Heating	100,792	213,885	282,745	352,717	318,259	247,469	109,620	61,630	49,907	40,759	40,160	50,642	1,868,584	
18	Residential Heating Low Income	115,678	298,227	449,062	615,104	566,582	347,154	129,362	60,737	49,071	45,013	44,359	54,307	2,774,655	
19	Small C&I	357,629	677,643	900,081	1,127,548	1,064,830	714,720	337,898	192,267	165,473	153,944	156,287	194,967	6,043,288	
20	Medium C&I	199,207	424,741	519,005	653,341	564,137	314,850	145,774	77,015	40,575	55,581	39,181	58,450	3,091,857	
21	Large LLF	94,200	88,389	140,338	147,390	155,847	129,368	76,319	84,416	70,262	70,672	65,801	80,908	1,203,909	
22	Large HLF	100,645	232,842	218,020	304,505	180,842	132,536	40,220	57,165	6,765	18,441	21,557	30,034	1,343,572	
23	Extra Large LLF	248,997	703,937	611,829	1,190,838	276,281	660,386	405,351	464,398	475,385	494,475	505,645	454,030	6,491,551	
24	Extra Large HLF	19,277	5,635	11,253	12,896	13,353	7,386	195	261	835	(1,362)	5,248	165	75,141	
25	Default	2,250,721	4,855,391	6,111,192	8,279,403	6,710,893	4,940,618	2,297,118	1,530,785	1,283,863	1,245,791	1,242,933	1,399,012	42,147,720	
26	Total Throughput	Source: GCR Deferred Filed November 2015 - Docket No. 4520													

Line No.		Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Total Nov-Oct	
27	Total THROUGHPUT	37,092	60,224	75,729	89,222	67,317	60,019	39,167	28,743	18,658	18,658	18,658	18,658	476,169	
28	Residential Non-Heating	1,316	2,434	3,160	3,548	2,537	2,941	1,956	1,023	327	327	327	327	19,241	
29	Residential Non-Heating Low Income	894,673	1,774,748	2,309,007	2,862,444	2,537,120	1,778,181	1,062,089	573,872	392,213	392,213	392,213	392,213	14,184,347	
30	Residential Heating	93,503	177,183	227,988	271,102	173,668	152,450	100,566	55,710	40,021	40,021	40,021	40,021	1,292,189	
31	Residential Heating Low Income	106,549	241,297	328,813	440,658	376,259	245,627	129,552	71,339	48,956	48,956	48,956	48,956	1,989,050	
32	Small C&I	348,671	568,689	710,649	902,877	764,825	558,619	369,646	211,771	158,015	158,015	158,015	158,015	4,593,761	
33	Medium C&I	193,388	308,698	375,350	542,278	427,367	277,720	171,746	55,130	17,537	17,537	17,537	17,537	2,369,215	
34	Large LLF	92,168	84,316	107,694	142,175	108,900	93,117	84,774	75,665	69,488	69,488	69,488	69,488	858,298	
35	Large HLF	136,916	161,823	167,814	277,699	190,821	124,061	104,983	19,361	(16,246)	(16,246)	(16,246)	(16,246)	1,167,232	
36	Extra Large LLF	520,078	572,601	567,112	654,211	556,902	457,318	526,550	459,011	519,756	519,756	519,756	519,756	4,833,537	
37	Extra Large HLF	4,805	8,633	5,044	8,588	5,343	4,502	4,208	102	527	527	527	527	41,752	
38	Default	2,429,157	3,960,645	4,878,358	6,194,802	5,211,058	3,754,555	2,595,237	1,551,727	1,249,252	1,249,252	1,249,252	1,249,252	31,824,792	
39	Total Throughput	Source: GCR Deferred Filed August 2016 - Docket No. 4576													

Division 2-8

Request:

Re: witness Nutile's Attachment SLN-6, please provide electronic spreadsheet file which fully documents the derivation of the detail on pages 4 through 7 for the monthly totals shown for:

- a. Firm (dth)
- a. Firm Revenue
- b. Firm Revenue less GET
- c. Total Gas Costs
- d. Energy Efficiency Surcharges
- e. Other charges

Response:

The electronic spreadsheet that supports the details of Schedule SLN-6 is being provided on a CD-ROM as Attachment DIV 2-8.

Consistent with the methodology used in prior DAC filings, the monthly totals for Non-firm Usage (dth), Non-firm Revenue, Non-firm Revenue subject to Margin Sharing, Total Gas Costs, Energy Efficiency Surcharges, and Other charges were derived based on the customers' actual billing information.

- a. Non-firm Usage (dth) – this is the total billed volume in dekatherms from all the active Non-firm customers in a given month.
- b. Non-firm Revenue – this is the total billed revenue from all the active Non-firm customers in a given month.
- c. Non-firm Revenue subject to Margin Sharing – this is the total billed revenue excluding Sales tax, Gross Earnings Tax, Energy Efficiency Surcharge, and other charges indicated below from all the active Non-firm customers in a given month.
- d. Total Gas Costs – this is the total billed gas charges from all the active Non-firm customers in a given month.

Division 2-8, page 2

- e. Energy Efficiency Surcharges – this is the total billed energy efficiency surcharges from all the active Non-firm customers in a given month.
- f. Other charges – this includes the total billed late payment interest charges, LIHEAP Enhancement charge, and deposit installments from all the active Non-firm customers in a given month.

Division 2-9

Request:

Re: witness Nutile's Attachment SLN-6, please:

- a. Document all curtailment and interruptions of service for individual non-firm customers during period April 1, 2015 through March 31, 2016 and for each curtailment:
 - i. Provide the start and stop dates and times for the curtailment or service interruption;
 - ii. Detail the methods and calculations used to computed curtailed therms of gas use;
 - iii. Provide the computation of any and all penalties or excess use charges for unauthorized gas use for each customer during each period of service curtailment or interruption;
 - iv. Provide the reasons for each curtailment or interruption of service;
 - v. Identify the dollar amounts by customer by month of any and all charges for unauthorized or excess gas use that were waived or forgiven by the Company, as well as the reasons for the Company's waiver or forgiveness of the subject charges.
- b. Document all billing adjustments for individual customers in excess of \$10,000 and provide all workpapers, data, and assumptions relied upon to support those adjustments, as well as the Company's reasons and rationales for those adjustments.

Response:

- a.
 - i. During the period April 1, 2015 through March 31, 2016, the start and stop dates and times for the curtailment or service interruption were as follows:

January 4, 2016 10:00 a.m. to January 6, 2016 10:00 a.m.
January 13, 2016 10:00 a.m. to January 14, 2016 10:00 a.m.
January 18, 2016 10:00 a.m. to January 23, 2016 10:00 a.m.
February 11, 2016 10:00 a.m. to February 16, 2016 10:00 a.m.

Division 2-9, page 2

- ii. Non-Firm customers are required to have phone lines that transmit gas usage via telemetered devices. During the winter curtailment season, the devices must call in every day and technicians are dispatched to collect the usage if a device does not call in. The Company's Meter Data Services Department collects gas usage in an hourly format in the Company's MV90 system and provides a query for the daily usage for each curtailment period to the Company's Special Billing Department. Special Billing then multiplies the CCFs by the therm conversion factor and adjusts for the fuel allowance to arrive at the therms to bill the customer. The Energy Efficient Charge is then added.
 - iii. Attachment DIV 2-9-a contains the computation of all penalties or excess use charges that have been billed for unauthorized gas use for each customer during service curtailments or interruptions. As approved in the Tariff Advice Filing in Docket No. 4514, distribution and Energy Efficiency Program charges are included in the calculations of penalty charges. For purposes of confidentiality, the customer names have been replaced with their assigned customer number.
 - iv. All the curtailment or interruptions of service were due to the forecasted cold weather and liquefied natural gas (LNG) use.
 - v. There were no charges waived for unauthorized or excess gas use during this period.
- b. Attachment DIV 2-9-b contains the details on all billing adjustments in excess of \$10,000 for individual Non-Firm customers.

Curtailment Period 2015-2016

Assigned #	Curtailment Date	Curtailment Use (ccf)	Curtailment Use (therm)	Curtailment Use Billed (therm)	Pipeline (e)	Daily Index (per Dth)	Penalty Multiplier (g)	Penalty Rate (per therm)	Distribution Charge (per therm)	Efficiency Charge (per therm)	Energy		Total Curtailment Charge	
											Penalty Charge (k)	Distribution Charge (l)		
		(b)	(a) x 1.031	(c) x 1.0339		(f)	(g)	(h)	(i)	(j)	(k) x (h)	(l) x (i)	(m)	(n)
14	1/4/2016	103	106	110	AGT	\$5.22	5	\$2.61	\$0.0912	\$0.0487	\$286.56	\$10.01	\$5.35	\$301.92
14	1/5/2016	89	92	95	AGT	\$8.00	5	\$4.00	\$0.0912	\$0.0487	\$379.48	\$8.65	\$4.62	\$392.75
14	1/13/2016	90	93	96	AGT	\$5.95	5	\$2.98	\$0.0912	\$0.0487	\$285.89	\$8.75	\$4.67	\$299.31
		282	291	301							\$951.93	\$27.41	\$14.64	\$993.98

Assigned # (a)	Month Charges Apply To (b)	Bill Date moyr (c)	Sales or Trans (d)	Customer Charge (e)	Usage (therms) (f)	Commodity charge (g)	Commodity rate (per therm) (h)	Distribution charge (i)	Distribution rate (j)	Sales tax (k)	G&T (l)	Energy Efficiency Surcharge (m)	Paperless credit (n)	Other charges (o)	Curtailments - Distribution (p)	Curtailments - Commodity Charge (q)	Total Bill (r)	Revenue subject to Margin Sharing (s)	Total Gas Cost (Col E - Col G) (t)	Total Margin (u)	Comment (v)	Adjustment Details (w)
16	Jan-14	Dec-15	Trms	\$0	(656)	N/A	\$19	\$0	\$0.0912	\$0	\$0	\$0	\$0	\$0	\$0.0000	(\$12,748)	(\$12,748)	(\$12,748)	\$0	Return of curtailment for 656 therms	This reflects a canceled curtailment charge originally billed in January 2014.	
14	Jan-16	Jan-16	Sales	(\$625)	(193,380)	(\$100,996)	\$0.5223	(\$17,636)	\$0.0912	\$0	(\$3,980)	(\$9,418)	\$0	(\$1)	\$0.0000	\$0	(\$132,656)	(\$119,258)	(\$100,996)	(\$18,261)	Canceled January 2016 bill	This reflects the canceled gas charges for December 31, 2015 - January 31, 2016

Division 2-10

Request:

Re: witness Nutile's Attachment SLN-7, please provide the workpapers, including electronic spreadsheet files, used in the development of the Company's RDM reconciliations, customer transfer adjustments, and normalizations.

Response:

The electronic spreadsheet that supports the details of Schedule SLN-7 is being provided on a CD-ROM as Attachment DIV 2-10.

Division 2-11

Request:

Re: witness Nutile's Attachment SLN-7, page 27 of 31, please:

- a. Provide the referenced "Normal Heating Degree Day Report" and the source data and calculations from which Actual and Normal Billing Degree Days for the months of Apr-15 to Mar-16 were developed.
- b. Identify the period for which "Normal Billing Degree Days" were computed for the purpose of this exhibit;
- c. Explain the manner in which the referenced Billing Degree Day data was used in the development of the Company's RDM reconciliations.

Response:

- a. The referenced "Normal Heating Degree Day Report" is provided in Attachment DIV 2-11-a. The calculations from which the Actual and Normal Billing Degree Days for the months of April 2015 to March 2016 were developed are provided on a CD-ROM as Attachment DIV 2-11-a.
- b. The "Normal Billing Degree Days" are based off the 10-year average ending December 2011.
- c. The referenced Billing Degree Day data is not used in the development of the Company's RDM reconciliations but rather as one component of the explanation of the RDM reconciliation balance ending March 31, 2016.

Daily Average Degree Days Based on 10 Years Ending December 2011

Day (a)	January (b)	February (c)	March (d)	April (e)	May (f)	June (g)	July (h)	August (i)	September (j)	October (k)	November (l)	December (m)	Total (n)
1	30	35	31	19	18	3	0	0	1	5	13	20	
2	33	32	29	18	16	1	0	0	1	6	19	28	
3	33	32	33	19	18	2	0	0	0	6	19	29	
4	31	33	33	21	13	4	0	0	0	5	19	30	
5	30	34	29	20	11	3	0	0	0	7	17	32	
6	31	35	28	21	6	4	0	0	1	9	16	32	
7	32	34	28	20	0	3	0	0	1	7	18	31	
8	32	35	26	20	0	1	1	0	0	6	16	33	
9	33	34	29	19	12	2	0	0	0	5	17	33	
10	35	34	29	17	9	1	0	0	1	6	17	29	
11	34	35	26	18	12	2	0	0	2	7	19	28	
12	31	36	24	16	17	2	0	0	2	9	19	27	
13	31	35	26	16	7	3	0	0	1	9	17	31	
14	34	34	24	14	7	2	0	0	0	11	15	31	
15	39	34	24	13	8	2	0	0	0	12	12	29	
16	40	35	25	15	11	2	0	0	3	11	16	29	
17	40	32	26	15	3	1	0	0	3	13	20	33	
18	36	32	25	11	2	2	0	0	3	12	23	35	
19	36	35	26	11	10	1	0	0	4	13	23	34	
20	36	33	27	10	11	1	0	0	3	13	21	34	
21	40	30	25	13	6	0	0	0	2	13	23	33	
22	40	31	24	14	11	1	0	0	2	15	21	30	
23	40	32	26	13	6	0	0	0	1	17	24	26	
24	40	34	24	10	3	0	0	0	2	16	24	26	
25	39	33	24	13	2	0	0	0	3	15	24	30	
26	39	33	22	12	0	0	0	0	2	13	23	30	
27	39	32	20	11	0	0	0	0	2	13	23	29	
28	36	32	22	12	5	0	0	0	1	15	21	29	
29	36	32	21	11	3	0	0	1	3	19	20	30	
30	35		19	11	0	0	0	0	6	17	20	30	
31	38		21	0	0	0	0	0	14	14	20	30	
Total	1099	936	796	453	227	44	1	1	52	339	579	931	5458
Total Leap Yea	1099	968	796	453	227	44	1	1	52	339	579	931	5490

Historic Daily Degree Days												
January	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2002-2011 10 Year Average	
Day												
1	38	24	26	21	35	21	31	52	32	23	30	
2	36	32	33	29	28	23	41	42	39	22	33	
3	36	33	22	16	31	26	52	35	45	35	33	
4	38	31	20	23	34	17	43	35	38	35	31	
5	30	36	29	29	29	11	33	32	41	33	30	
6	30	37	36	35	31	6	22	35	37	40	31	
7	28	42	44	32	37	17	18	32	33	36	32	
8	38	35	45	33	33	16	12	31	39	34	32	
9	31	26	56	34	23	27	16	40	42	35	33	
10	22	31	57	28	27	33	23	43	45	36	35	
11	27	38	50	31	21	35	17	39	42	39	34	
12	28	35	36	32	21	21	22	41	38	36	31	
13	29	35	37	19	25	18	26	39	41	40	31	
14	30	43	58	17	13	27	30	39	36	46	34	
15	30	42	61	36	36	25	32	51	30	45	39	
16	31	42	61	38	45	31	35	54	29	38	40	
17	30	42	40	43	33	46	37	53	31	47	40	
18	32	54	34	54	18	35	24	41	29	36	36	
19	39	48	43	49	27	26	32	36	31	28	36	
20	36	40	48	41	18	39	39	38	28	35	36	
21	36	48	44	54	17	44	45	44	30	39	40	
22	31	51	40	52	29	40	37	41	33	47	40	
23	28	54	48	48	30	36	32	38	33	52	40	
24	22	46	52	51	31	33	39	38	34	58	40	
25	29	42	55	44	26	42	41	52	17	43	39	
26	23	35	50	42	32	56	37	48	24	42	39	
27	23	46	45	53	33	47	36	41	29	37	39	
28	21	54	41	31	21	30	31	32	37	41	36	
29	13	40	43	46	23	41	30	35	49	35	36	
30	22	38	46	33	22	42	25	36	51	38	35	
31	31	31	45	41	29	37	34	43	43	44	38	
Total	918	1231	1345	1157	856	948	972	1256	1106	1195	1099	

Historic Daily Degree Days											
February											
Day	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2002-2011 10 Year Average
1	26	31	42	42	27	35	26	33	38	45	35
2	34	28	37	40	27	31	24	27	39	37	32
3	38	23	33	35	18	36	26	34	35	45	32
4	32	23	28	31	22	44	31	44	36	42	33
5	40	35	34	24	18	50	20	51	36	34	34
6	35	40	33	28	27	45	22	48	41	27	35
7	32	39	28	25	31	46	30	35	41	32	34
8	25	45	42	31	36	43	33	20	38	37	35
9	32	38	31	21	36	42	35	32	33	44	34
10	29	36	23	29	39	41	33	32	33	45	34
11	30	42	32	33	37	40	46	18	29	47	35
12	35	42	42	37	42	35	44	19	33	40	36
13	32	53	29	31	41	44	25	29	36	34	35
14	40	52	28	34	32	36	30	31	32	20	34
15	29	53	42	22	24	46	27	31	29	36	34
16	20	55	43	22	23	42	38	35	32	37	35
17	28	44	40	31	22	36	32	34	32	24	32
18	30	41	35	40	41	36	13	35	26	18	32
19	30	37	30	44	45	47	28	26	26	33	35
20	25	28	32	39	40	29	37	39	25	38	33
21	14	27	26	36	33	25	39	32	30	41	30
22	23	28	26	35	32	31	37	30	26	39	31
23	28	30	27	34	29	37	35	36	29	34	32
24	29	35	33	41	33	38	34	37	24	36	34
25	28	43	31	40	39	31	31	36	22	24	33
26	17	51	28	41	44	32	29	28	29	32	33
27	23	44	27	37	47	31	32	18	30	35	32
28	35	37	22	38	43	26	42	23	30	27	32
29			22				45				
30											
31											
Total	819	1080	921	936	928	1055	924	893	890	963	968

Historic Daily Degree Days March		2002-2011										2002-2011 10 Year Average
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
Day	1	33	36	17	35	37	31	30	37	23	31	31
	2	30	26	15	35	39	25	30	43	22	29	29
	3	17	41	19	41	41	23	28	44	29	43	33
	4	30	44	21	40	37	28	13	45	29	38	33
	5	39	27	24	35	29	34	15	38	26	20	29
	6	27	36	16	31	33	50	27	26	20	11	28
	7	22	46	22	25	31	49	25	17	20	24	28
	8	21	31	32	35	29	44	12	12	15	29	26
	9	11	29	33	47	25	46	27	27	19	30	29
	10	21	44	31	31	11	29	32	27	23	24	29
	11	33	39	24	40	14	21	29	21	23	20	26
	12	28	23	25	31	19	23	25	30	20	20	24
	13	27	33	29	31	17	18	29	35	23	21	26
	14	12	40	34	31	15	11	22	30	18	30	24
	15	22	30	18	28	26	17	26	22	24	30	24
	16	21	18	30	27	27	33	24	26	19	24	25
	17	30	14	36	28	31	32	26	25	19	21	26
	18	32	18	35	28	33	34	29	22	10	8	25
	19	29	30	35	26	34	31	23	22	11	23	26
	20	30	28	35	27	34	26	19	30	9	28	27
	21	23	14	23	29	30	34	28	30	11	29	25
	22	38	8	36	24	27	20	26	23	17	24	24
	23	32	17	36	27	21	17	27	36	19	28	26
	24	22	19	25	29	24	22	28	30	16	29	24
	25	27	25	18	24	26	23	29	30	13	29	24
	26	21	13	15	27	21	25	17	27	23	33	22
	27	17	14	12	28	17	7	24	14	32	30	20
	28	21	17	25	22	24	14	26	18	28	27	22
	29	21	9	24	18	20	21	29	21	16	28	21
	30	12	20	27	15	13	16	30	21	14	23	19
	31	13	29	24	21	12	21	25	19	18	24	21
Total		762	818	796	928	797	825	782	840	609	808	796

Historic Daily Degree Days		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2002-2011 10 Year Average			
Day	April	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22		
1	14	30	21	20	8	22	8	22	8	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	
2	18	21	24	17	8	23	8	23	19	23	19	23	19	23	19	23	19	23	19	23	19	23	19	23	19
3	14	25	24	17	19	23	19	23	24	26	24	26	24	26	24	26	24	26	24	26	24	26	24	26	24
4	24	31	21	17	23	26	23	26	23	26	23	26	23	26	23	26	23	26	23	26	23	26	23	26	23
5	27	31	27	15	29	25	23	25	23	25	23	25	23	25	23	25	23	25	23	25	23	25	23	25	23
6	25	27	24	16	23	30	23	30	23	30	23	30	23	30	23	30	23	30	23	30	23	30	23	30	23
7	29	32	19	9	19	30	19	30	19	30	19	30	19	30	19	30	19	30	19	30	19	30	19	30	19
8	18	33	20	15	19	29	19	29	19	29	19	29	19	29	19	29	19	29	19	29	19	29	19	29	19
9	7	30	16	15	21	23	21	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
10	9	24	17	15	18	24	18	24	18	24	18	24	18	24	18	24	18	24	18	24	18	24	18	24	18
11	16	26	22	19	16	25	16	25	17	25	17	25	17	25	17	25	17	25	17	25	17	25	17	25	17
12	17	13	17	22	12	22	12	22	12	22	12	22	12	22	12	22	12	22	12	22	12	22	12	22	12
13	1	16	16	22	7	21	7	21	18	21	18	21	18	21	18	21	18	21	18	21	18	21	18	21	18
14	2	20	9	19	11	21	11	21	20	21	20	21	20	21	20	21	20	21	20	21	20	21	20	21	20
15	3	4	17	20	6	20	6	20	17	20	17	20	17	20	17	20	17	20	17	20	17	20	17	20	17
16	3	0	19	19	9	17	9	17	20	17	20	17	20	17	20	17	20	17	20	17	20	17	20	17	20
17	0	29	12	16	13	24	13	24	16	24	16	24	16	24	16	24	16	24	16	24	16	24	16	24	16
18	0	24	8	6	7	8	7	8	8	7	8	7	8	7	8	7	8	7	8	7	8	7	8	7	8
19	2	18	2	12	4	17	4	17	4	17	4	17	4	17	4	17	4	17	4	17	4	17	4	17	4
20	2	15	7	0	5	16	5	16	7	16	5	16	5	16	5	16	5	16	5	16	5	16	5	16	5
21	12	15	16	18	15	6	15	6	8	15	8	6	8	15	8	6	8	15	8	6	8	15	8	6	8
22	22	19	4	18	20	7	20	7	9	20	7	9	20	7	9	20	7	9	20	7	9	20	7	9	20
23	23	17	14	10	16	4	16	4	2	16	4	2	16	4	2	16	4	2	16	4	2	16	4	2	16
24	18	20	11	14	17	2	17	2	0	17	2	0	17	2	0	17	2	0	17	2	0	17	2	0	17
25	20	19	20	18	9	11	9	11	8	9	11	8	9	11	8	9	11	8	9	11	8	9	11	8	9
26	20	15	17	12	17	15	17	15	12	17	15	12	17	15	12	17	15	12	17	15	12	17	15	12	17
27	18	9	6	12	13	14	13	14	17	13	14	17	13	14	17	13	14	17	13	14	17	13	14	17	13
28	18	6	16	12	15	10	15	10	13	15	10	13	15	10	13	15	10	13	15	10	13	15	10	13	15
29	22	1	11	13	16	8	16	8	14	16	8	14	16	8	14	16	8	14	16	8	14	16	8	14	16
30	20	10	0	13	12	4	12	4	18	12	4	18	12	4	18	12	4	18	12	4	18	12	4	18	12
31	20	10	0	13	12	4	12	4	18	12	4	18	12	4	18	12	4	18	12	4	18	12	4	18	12
Total	424	580	457	448	427	541	404	457	448	427	541	404	457	448	427	541	404	457	448	427	541	404	457	448	

Historic Daily Degree Days June		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2002-2011 10 Year Average
Day												
1		0	7	12	5	0	0	0	8	0	0	0
2		0	4	0	8	0	0	0	0	0	0	1
3		4	4	1	1	7	1	0	0	0	4	2
4		6	9	5	0	6	4	2	3	0	4	4
5		0	7	5	0	1	0	5	7	0	0	3
6		12	0	11	0	0	3	8	3	0	0	4
7		8	6	6	0	8	5	0	0	0	0	3
8		0	1	0	0	8	0	0	0	2	0	1
9		0	5	0	0	3	3	0	7	5	0	2
10		0	0	0	0	5	0	0	5	3	0	1
11		8	0	2	0	0	0	0	4	4	5	2
12		8	0	4	0	0	0	0	0	2	8	2
13		8	5	3	0	0	7	0	0	0	4	3
14		6	0	1	0	0	6	0	3	0	6	2
15		10	0	0	10	0	2	2	4	0	0	3
16		5	7	0	6	0	1	1	4	0	0	2
17		0	7	0	0	0	0	0	5	0	0	1
18		0	6	0	3	0	0	1	5	0	0	2
19		0	0	0	5	0	0	0	0	0	0	1
20		0	0	1	4	0	0	0	0	0	0	1
21		0	2	0	0	0	0	0	0	0	0	0
22		0	7	0	0	0	0	0	3	0	0	1
23		0	0	0	0	0	1	0	0	0	0	0
24		0	0	0	0	0	0	0	2	0	1	0
25		0	0	0	0	0	0	0	0	0	0	0
26		0	0	0	0	0	0	0	0	0	0	0
27		0	0	0	0	0	0	0	0	0	0	0
28		0	0	0	0	0	0	0	0	0	0	0
29		0	0	0	0	0	0	0	0	0	0	0
30		0	0	0	0	0	0	0	0	0	0	0
31		0	0	0	0	0	0	0	0	0	0	0
Total		75	77	51	42	38	33	19	63	16	39	44

Historic Daily Degree Days		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2002-2011 10 Year Average	
July	Day																						
	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
	11	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	2	6	6	0	0	0	0	0	6	0	0	0	0	0	0	1	

Historic Daily Degree Days		2002-2011	
August		10 Year	Average
Day	Year	2002	2011
1	2002	0	0
2	2002	0	0
3	2002	0	0
4	2002	0	0
5	2002	0	0
6	2002	0	0
7	2002	0	0
8	2002	0	0
9	2002	0	0
10	2002	0	0
11	2002	0	0
12	2002	0	0
13	2002	0	0
14	2002	0	0
15	2002	0	0
16	2002	0	0
17	2002	0	0
18	2002	0	0
19	2002	0	0
20	2002	0	0
21	2002	0	0
22	2002	0	0
23	2002	0	0
24	2002	0	0
25	2002	0	0
26	2002	0	0
27	2002	0	0
28	2002	0	0
29	2002	0	0
30	2002	0	0
31	2002	2	0
Total		2	1
2003		0	0
2004		0	0
2005		0	0
2006		0	0
2007		0	0
2008		0	0
2009		0	0
2010		0	0
2011		0	0
2002-2011		0	0
Total		2	1

Historic Daily Degree Days September		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2002-2011 10 Year Average
Day												
1		3	2	0	0	1	0	0	1	0	0	1
2		0	4	0	0	0	0	0	1	0	0	1
3		0	0	0	0	0	0	0	1	0	0	0
4		0	0	0	0	0	0	0	0	0	0	0
5		0	0	3	0	0	0	0	0	0	0	0
6		0	0	4	0	0	0	0	3	0	0	1
7		0	0	0	0	0	0	0	4	0	3	1
8		0	0	0	0	0	0	0	0	0	2	0
9		0	6	0	0	0	0	0	0	0	0	1
10		0	5	0	0	4	0	1	4	0	0	1
11		0	0	0	2	6	0	4	5	1	3	2
12		3	1	2	0	6	0	4	0	6	0	2
13		0	0	0	0	7	2	0	0	3	0	1
14		0	0	3	0	0	1	0	0	0	0	0
15		0	0	4	0	0	4	0	0	3	0	1
16		0	0	0	0	0	7	2	4	6	9	3
17		0	0	0	0	0	7	2	8	0	9	3
18		0	0	0	0	0	7	4	4	3	5	3
19		0	0	10	0	0	6	10	7	1	6	4
20		0	0	6	0	0	0	8	7	1	5	3
21		0	0	2	0	6	0	2	4	5	0	2
22		0	0	0	0	7	0	9	1	0	0	2
23		0	0	0	0	1	0	7	0	0	0	1
24		2	1	1	6	0	0	8	0	0	0	2
25		0	0	2	8	4	0	8	8	0	0	3
26		3	0	0	0	4	0	2	12	0	0	2
27		0	0	1	2	7	0	0	3	2	0	2
28		0	0	1	6	4	0	0	0	0	0	1
29		7	4	9	3	8	0	0	3	0	0	3
30		5	8	7	12	12	4	1	11	0	0	6
31												
Total		23	31	57	39	77	38	72	91	31	42	52

Historic Daily Degree Days October		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2002-2011 10 Year Average
Day												
1		0	11	3	9	6	8	0	15	0	0	5
2		0	12	4	3	5	5	9	14	5	3	6
3		0	17	9	3	4	0	9	3	11	5	6
4		3	13	9	0	0	0	12	1	7	4	5
5		0	15	16	0	5	0	17	6	6	8	7
6		8	17	16	0	11	0	12	8	9	12	9
7		3	16	8	0	9	2	11	1	7	14	7
8		11	7	6	0	12	1	11	9	4	0	6
9		14	2	2	3	4	5	0	9	9	0	5
10		9	6	5	10	2	7	4	10	11	0	6
11		8	5	9	7	9	4	7	14	4	2	7
12		6	8	8	10	1	12	8	18	7	8	9
13		6	5	8	7	17	15	5	16	11	3	9
14		15	11	13	4	17	12	7	20	12	0	11
15		19	7	6	6	17	13	5	25	12	6	12
16		8	12	9	8	16	9	4	24	12	6	11
17		11	16	16	11	16	10	12	22	10	6	13
18		16	17	15	10	2	0	17	22	12	7	12
19		15	25	17	9	7	0	19	20	13	9	13
20		14	23	14	14	10	2	17	16	12	3	13
21		17	8	17	18	16	2	17	9	14	10	13
22		21	18	16	22	19	0	21	4	21	12	15
23		24	26	18	18	15	0	24	11	17	17	17
24		22	26	16	21	17	2	19	7	16	16	16
25		21	23	17	19	16	15	12	10	5	13	15
26		16	8	17	20	18	13	10	12	0	17	13
27		13	4	13	22	21	2	12	19	0	23	13
28		19	12	20	22	9	15	20	13	0	24	15
29		25	6	18	24	16	22	25	17	14	26	19
30		25	14	12	11	14	15	26	16	16	25	17
31		23	13	1	10	11	12	19	5	16	25	14
Total		392	403	358	321	342	203	391	396	293	304	339

Historic Daily Degree Days November		Historic Daily Degree Days										2002-2011 10 Year Average			
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011				
Day															
1	21	1	14	10	8	7	13	13	23	21	13				
2	29	2	18	14	19	17	27	17	24	18	19				
3	29	0	17	17	23	18	24	15	25	18	19				
4	25	16	23	10	24	16	16	20	19	21	19				
5	22	16	16	6	27	19	8	21	11	25	17				
6	19	8	17	6	21	18	8	23	17	23	16				
7	28	14	14	14	18	22	7	25	22	15	18				
8	21	26	19	14	8	28	7	10	23	7	16				
9	10	32	29	16	3	24	14	13	13	13	17				
10	5	29	33	16	11	27	20	6	18	8	17				
11	1	26	21	27	14	28	23	14	19	17	19				
12	11	13	26	25	8	28	25	17	14	21	19				
13	18	15	30	18	10	17	20	14	12	16	17				
14	20	27	30	10	7	19	9	8	18	5	15				
15	13	27	19	18	6	11	2	6	14	2	12				
16	23	29	25	6	3	24	11	11	13	10	16				
17	23	23	25	23	8	27	24	21	8	19	20				
18	24	21	16	29	18	26	31	23	17	28	23				
19	28	13	11	30	20	27	36	18	27	24	23				
20	21	12	23	21	25	30	36	7	24	8	21				
21	23	17	21	19	27	21	36	16	28	20	23				
22	18	17	19	22	25	11	40	18	16	27	21				
23	25	20	24	35	19	30	37	18	10	23	24				
24	25	24	17	29	16	36	32	17	22	25	24				
25	24	24	15	37	23	26	21	16	30	19	24				
26	22	28	30	35	21	15	28	15	23	13	23				
27	34	21	27	24	13	16	26	20	29	19	23				
28	41	11	16	16	19	25	26	17	29	7	21				
29	34	15	21	9	18	21	27	20	27	9	20				
30	22	22	23	11	5	28	31	15	27	14	20				
Total	659	549	639	567	467	662	665	474	602	495	579				

Historic Daily Degree Days		2002-2011										
December		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	10 Year Average
Day												
1		33	22	15	21	1	35	14	26	14	23	20
2		34	37	26	26	16	41	22	22	26	25	28
3		40	42	28	31	27	32	29	6	28	25	29
4		42	34	31	36	30	37	22	18	29	24	30
5		41	39	23	38	37	37	30	26	34	17	32
6		36	36	36	34	30	38	36	32	36	10	32
7		40	36	26	39	19	36	37	32	34	13	31
8		30	35	17	38	39	28	46	29	38	25	33
9		43	38	27	34	34	33	29	26	43	25	33
10		37	29	22	36	21	34	12	27	45	25	29
11		34	18	18	33	23	31	25	38	29	32	28
12		28	30	25	33	24	23	17	38	24	30	27
13		29	37	24	45	16	37	38	30	21	28	31
14		21	36	37	47	18	31	31	24	39	27	31
15		24	29	40	44	17	37	12	21	45	18	29
16		32	31	36	24	20	34	22	32	39	18	29
17		39	23	29	32	21	37	32	45	39	28	33
18		36	28	37	36	17	42	30	43	36	42	35
19		31	32	30	36	26	36	40	40	36	35	34
20		14	32	43	37	30	31	47	42	36	29	34
21		25	35	45	39	21	36	38	38	31	20	33
22		23	20	30	37	30	32	44	39	28	14	30
23		26	15	19	25	14	20	44	45	30	25	26
24		28	17	24	23	23	19	25	36	32	37	26
25		30	21	37	25	27	30	22	33	38	35	30
26		32	29	38	19	18	33	34	25	39	29	30
27		34	23	45	29	27	27	21	22	39	25	29
28		34	25	46	30	28	24	12	30	39	22	29
29		31	23	29	18	33	22	28	43	35	37	30
30		34	20	32	25	31	30	30	43	33	24	30
31		23	21	28	34	30	30	45	37	28	27	30
Total		984	893	943	1004	748	993	914	988	1043	794	931