Appendix R
Siting of Meteorological Instruments

NRC Regulatory Guide 3.63 provides guidance acceptable to the NRC regarding the siting of meteorological instruments. The siting of the Marsland Expansion Area meteorological tower followed guidance in NRC Regulatory Guide 3.63, which states:

> "The location of the meteorological instruments should represent as closely as possible the long-term meteorological characteristics of the area for which the measurements are being made. Whenever possible, the base of the instrument tower or mast should be sited at approximately the same elevation as the facility operation. Ideally, the instruments should be located in an area where localized singular natural or man-made obstructions (e.g., trees, buildings) will have little or no influence on meteorological measurements. Measurements of wind speed, wind direction and sigma theta...should be made at least 10 obstruction heights away from the nearest obstruction. To the extent practicable, these instruments should not be located in the prevailing downwind direction of an obstruction." In addition to criteria related to wind measurement, the guide also addresses solar radiation. "If instrumentation is used to measure incoming solar radiation, it should be located in an area as free as possible from terrestrial shadows."

Accordingly, the following siting issues were considered:

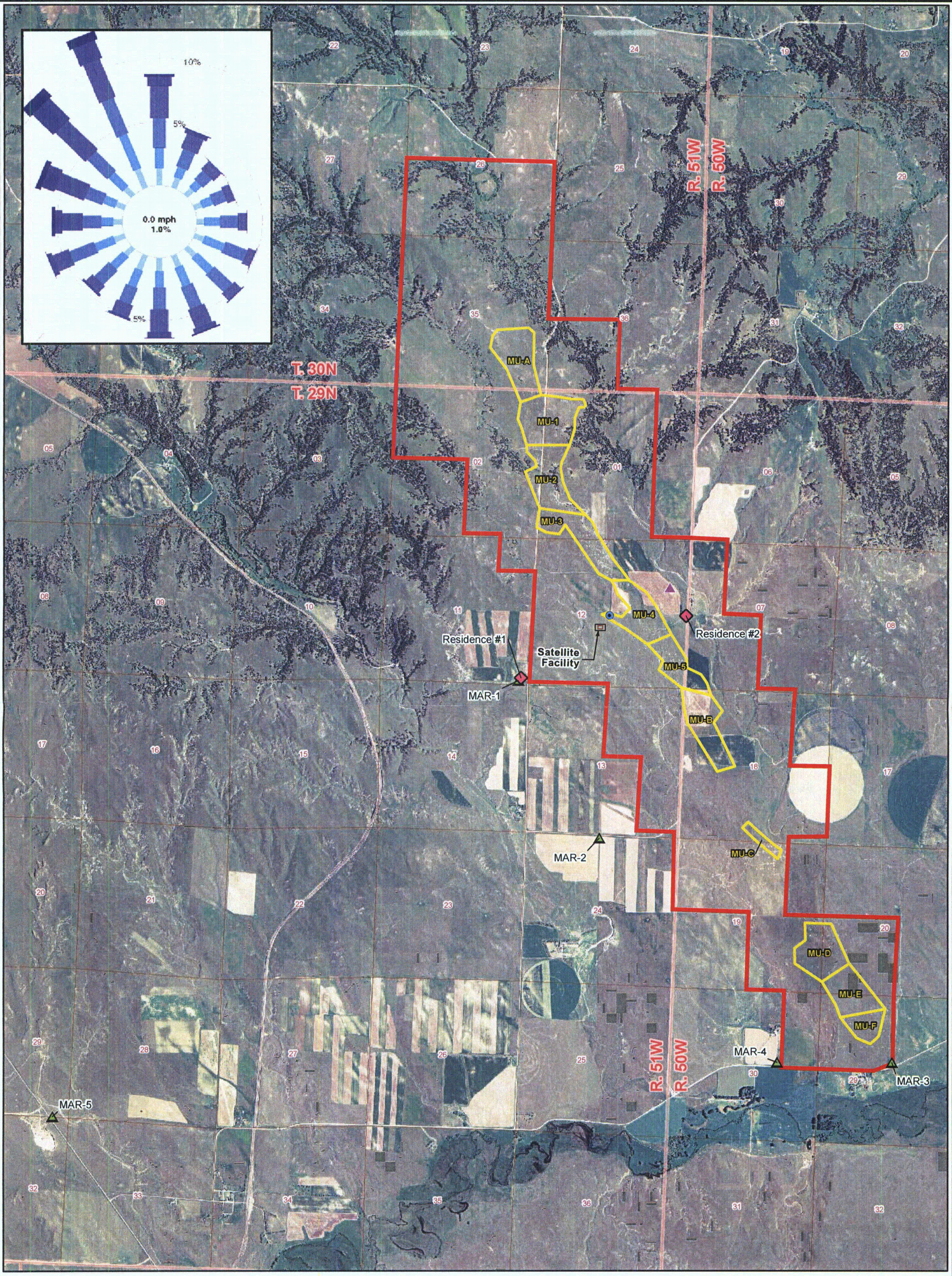
1. **Elevation** – The meteorological monitoring tower, at 4,240 ft. above sea level, is near the elevation of the proposed satellite plant (4,245 ft.). The meteorological site elevation is also representative of the entire Marsland Expansion Area, in which surface elevations range generally between 4,100 and 4,300 ft. above sea level.

2. **Proximity** – The meteorological monitoring tower is located 0.4 miles east-northeast of the proposed plant site. **Figure R-1** shows the location of the tower relative to the plant site.

3. **Topography** – Both the meteorological monitoring tower and the proposed plant site are surrounded by relatively flat topography. A small drainage runs through the area, but the monitoring tower is situated on a flat area above the stream channel.

4. **Obstructions** – **Figure R-2** depicts the area surrounding the Marsland meteorological tower and proposed plant site. The area is relatively flat with no trees, structures or other obstructions in the vicinity of the meteorological tower.

5. **Shadows** – There are no trees, large rocks or other obstructions in the immediate vicinity that would compromise solar radiation exposure at the meteorological station.



LEGEND

- Proposed Deep Disposal Well
- Air Sample Station
- Met Station
- Residence
- Mine Unit
- Proposed Marsland Expansion Area

N

0 3,000 6,000

Feet

PROJECTION: NAD1927,
STATE PLANE NEBRASKA NORTH, FIPS 2601
SOURCES: USDA NAIP IMAGERY 2010

CROW BUTTE RESOURCES, INC.

FIGURE R-1
MARSLAND METEOROLOGICAL STATION AND PLANT LOCATION

Path: K:\CBR_Projects\CO001636_Marsland\2_GIS\ArcMaps\0006_APPENDIX\R-2 MET station closeup.mxd Date: 4/29/2013 Last Saved By: jchen

LEGEND

- Met Station
- Centroid of Proposed Satellite Facility
- Proposed Satellite Plant Footprint
- Proposed Fence

N

0 250 500

Feet

PROJECTION: NAD1983,
STATE PLANE NEBRASKA NORTH, FIPS 2601
SOURCES: USDA NAIP IMAGERY 2010

CROW BUTTE RESOURCES, INC.

FIGURE R-2
LOCATION OF
MARSLAND METEOROLOGICAL STATION
(CLOSEUP)

Appendix S
Justification for Use of 15 Years of Scottsbluff's Meteorological Data

The regression analyses for wind parameters at the Scottsbluff meteorological station are repeated below with p-values as requested in NRC Comment #4 a). As seen in **Figure S-1**, the wind direction correlation produced a very high coefficient of determination, or R^2. In the wind direction regression analysis below, the p-value of 0.000 indicates virtually no chance that this R^2 value is accidental. In other words, the 1-year distribution of wind directions is strongly correlated with the 15-year distribution, to a high degree of confidence.

Scottsbluff Regression Analysis: 15-Year Directions versus 1-Year Directions

The regression equation is:

15-Year Directions = 0.006077 + 0.9028 1-Year Directions

S = 0.00689141 R-Sq = 97.5% R-Sq(adj) = 97.4%

<u>Analysis of Variance</u>

Source	DF	SS	MS	F	P
Regression	1	0.0262411	0.0262411	552.54	0.000
Error	14	0.0006649	0.0000475		
Total	15	0.0269060			

In similar fashion, the wind speed correlation produced a very high coefficient of determination (**Figure S-2**). The p-value of 0.001 shown in the regression analysis below indicates a 99.9% confidence that this R^2 value is not accidental. In other words, the 1-year distribution of wind speeds is strongly correlated with the 15-year distribution, to a high degree of confidence.

Scottsbluff Regression Analysis: 15-Year Speeds versus 1-Year Speeds

The regression equation is:

15-Year Speeds = 0.00959 + 0.9425 1-Year Speeds

S = 0.0321279 R-Sq = 94.8% R-Sq(adj) = 93.5%

<u>Analysis of Variance</u>

Source	DF	SS	MS	F	P
Regression	1	0.0748612	0.0748612	72.53	0.001
Error	4	0.0041288	0.0010322		
Total	5	0.0789900			

In response to NRC Comment #4 b), hourly wind data were retrieved from the Chadron airport meteorological station. **Figures S-3** and **S-4** illustrate strong similarities between the baseline year and the 12-year period from 2001 through 2012.

The similarities in **Figures S-5** and **S-6** are further illustrated by comparing the bar graphs of wind direction and wind speed distributions between the baseline year and the 12-year period (**Figures S-5** and **S-6**).

The regression analyses for wind parameters at the Chadron meteorological station are presented below with p-values as requested in NRC Comment #4 a). **Figure S-7** shows the wind direction correlation produced a very high coefficient of determination, or R^2. As seen in the regression analysis below, the p-value of 0.000 indicates virtually no chance that this R^2 value is accidental. In other words, the 1-year distribution of wind directions is strongly correlated with the 12-year distribution, to a high degree of confidence.

Chadron Regression Analysis: 12-Year Directions versus 1-Year Directions

The regression equation is:

12-Year Directions = 0.002237 + 0.9618 1-Year Directions

S = 0.00685647 R-Sq = 95.8% R-Sq(adj) = 95.5%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	0.0160024	0.0160024	340.39	0.000
Error	15	0.0007052	0.0000470		
Total	16	0.0167075			

In similar fashion, the wind speed correlation for Chadron produced a very high coefficient of determination (**Figure S-8**). The p-value of 0.000 shown in the regression analysis below indicates virtual certainty that this R^2 value is not accidental. In other words, the 1-year distribution of wind speeds is strongly correlated with the 12-year distribution, to a high degree of confidence.

Chadron Regression Analysis: 12-Year Speeds versus 1-Year Speeds

The regression equation is:

12-Year Speeds = - 0.00580 + 1.04 1-Year Speeds

S = 0.0146045 R-Sq = 98.2% R-Sq(adj) = 97.9%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	0.0590527	0.0590527	276.86	0.000
Error	5	0.0010665	0.0002133		
Total	6	0.0601191			

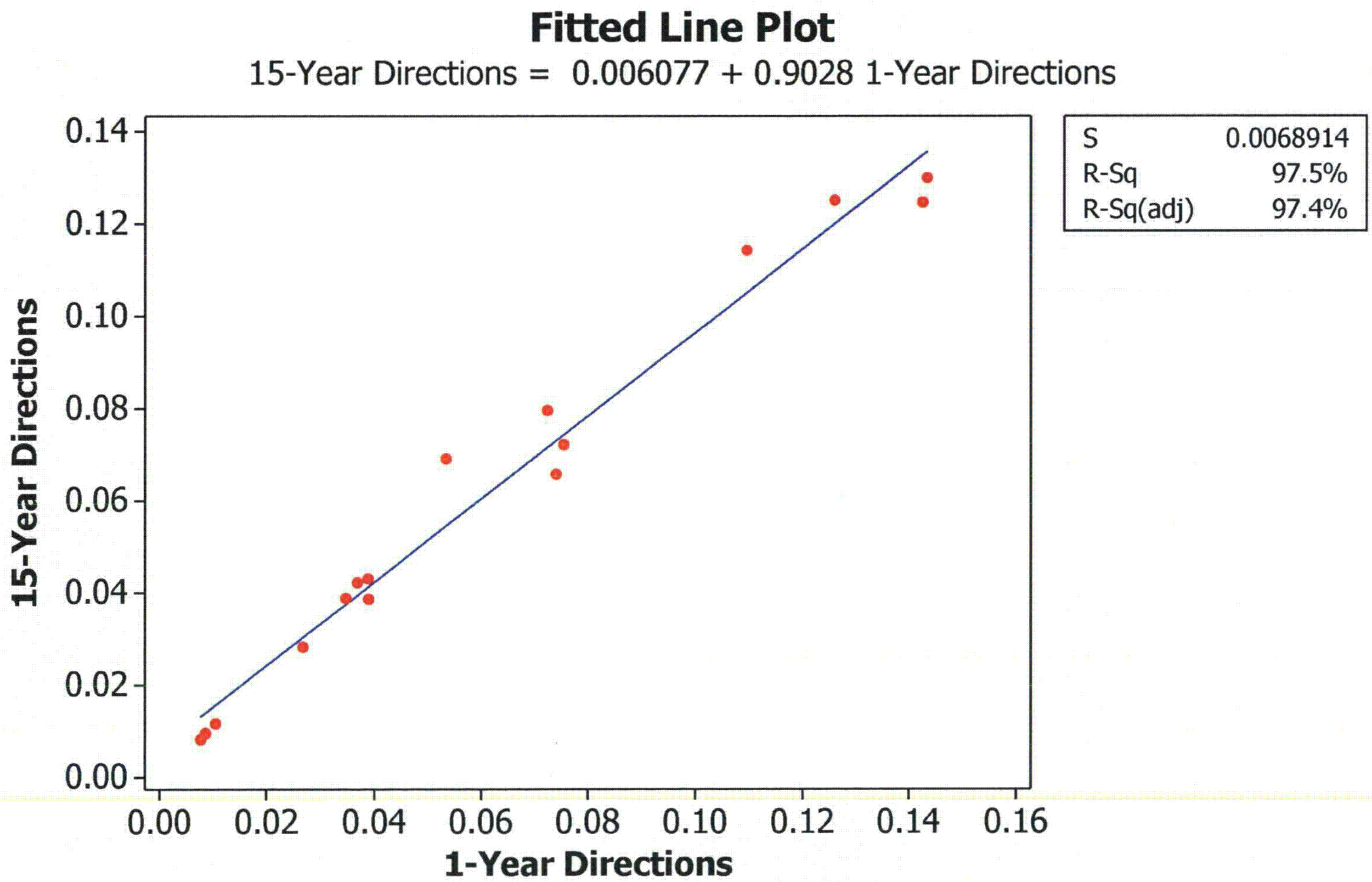


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FIGURE S-1
WIND DIRECTION CORRELATION FOR SCOTTSBLUFF AIRPORT

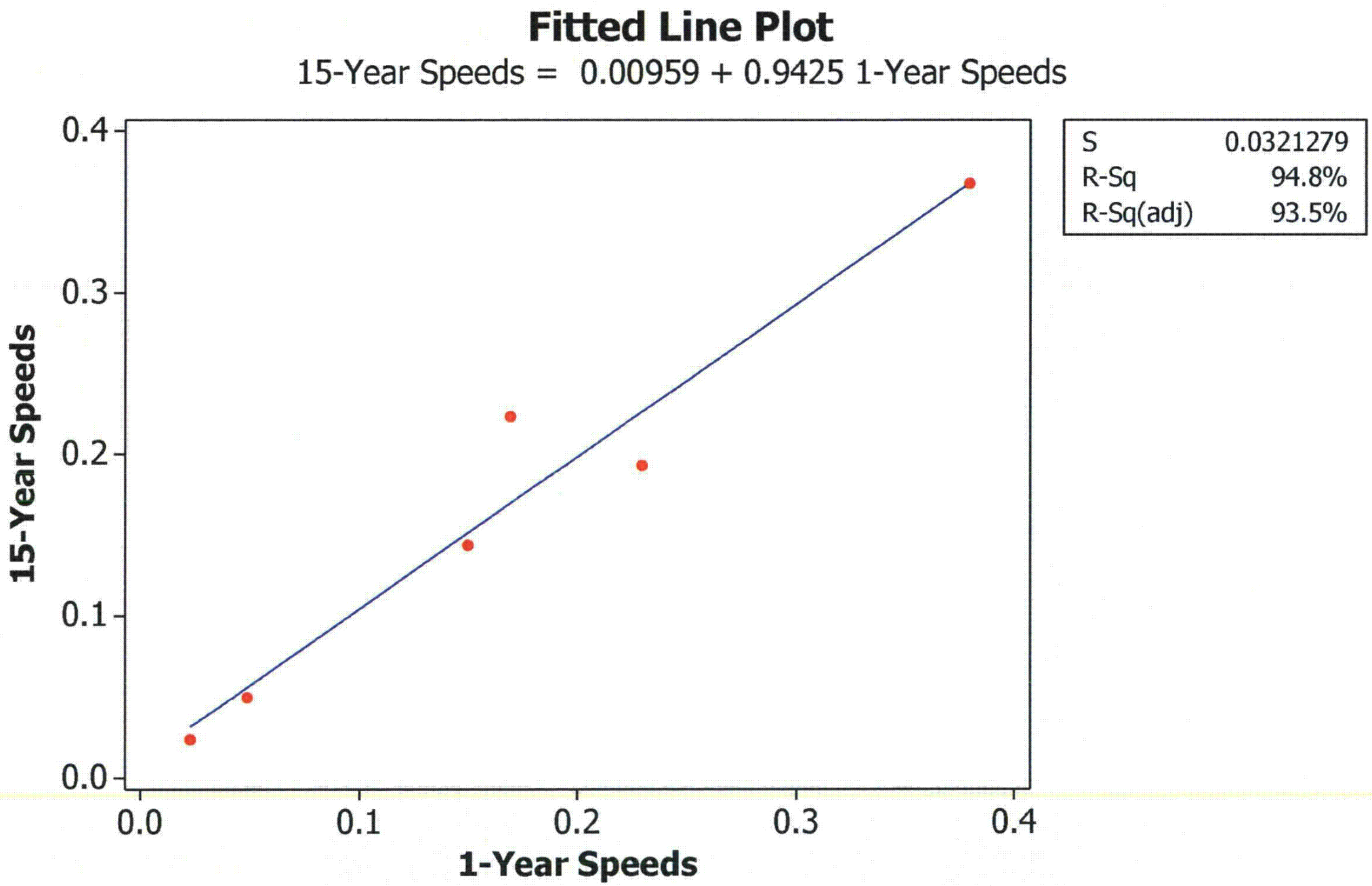

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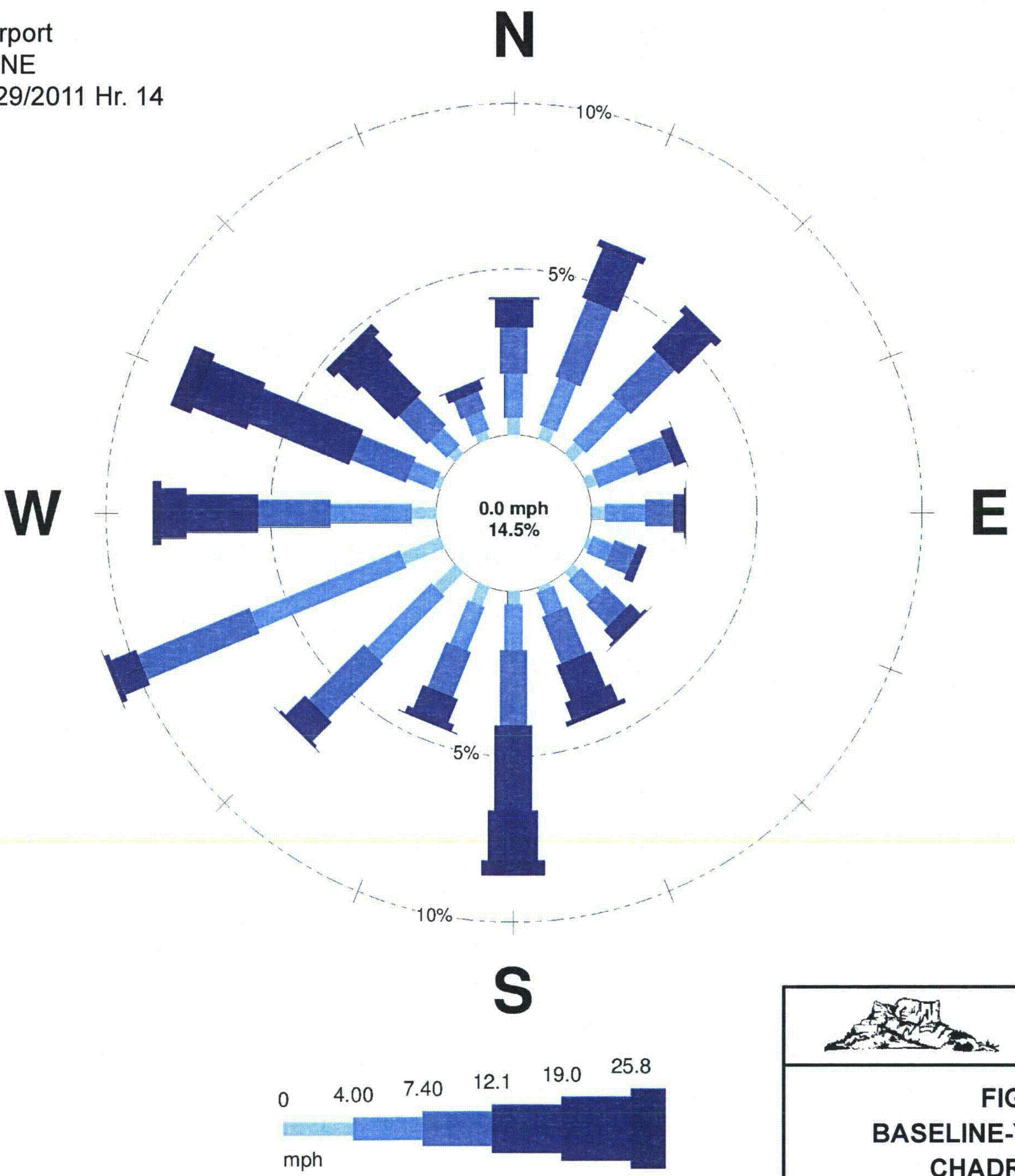
FIGURE S-2
WIND SPEED CORRELATION
FOR SCOTTSBLUFF AIRPORT

Chadron Airport
Chadron, NE
8/24/2010 Hr. 2 to 8/29/2011 Hr. 14



CROW BUTTE
RESOURCES, INC.

FIGURE S-3
BASELINE-YEAR WIND ROSE
CHADRON AIRPORT

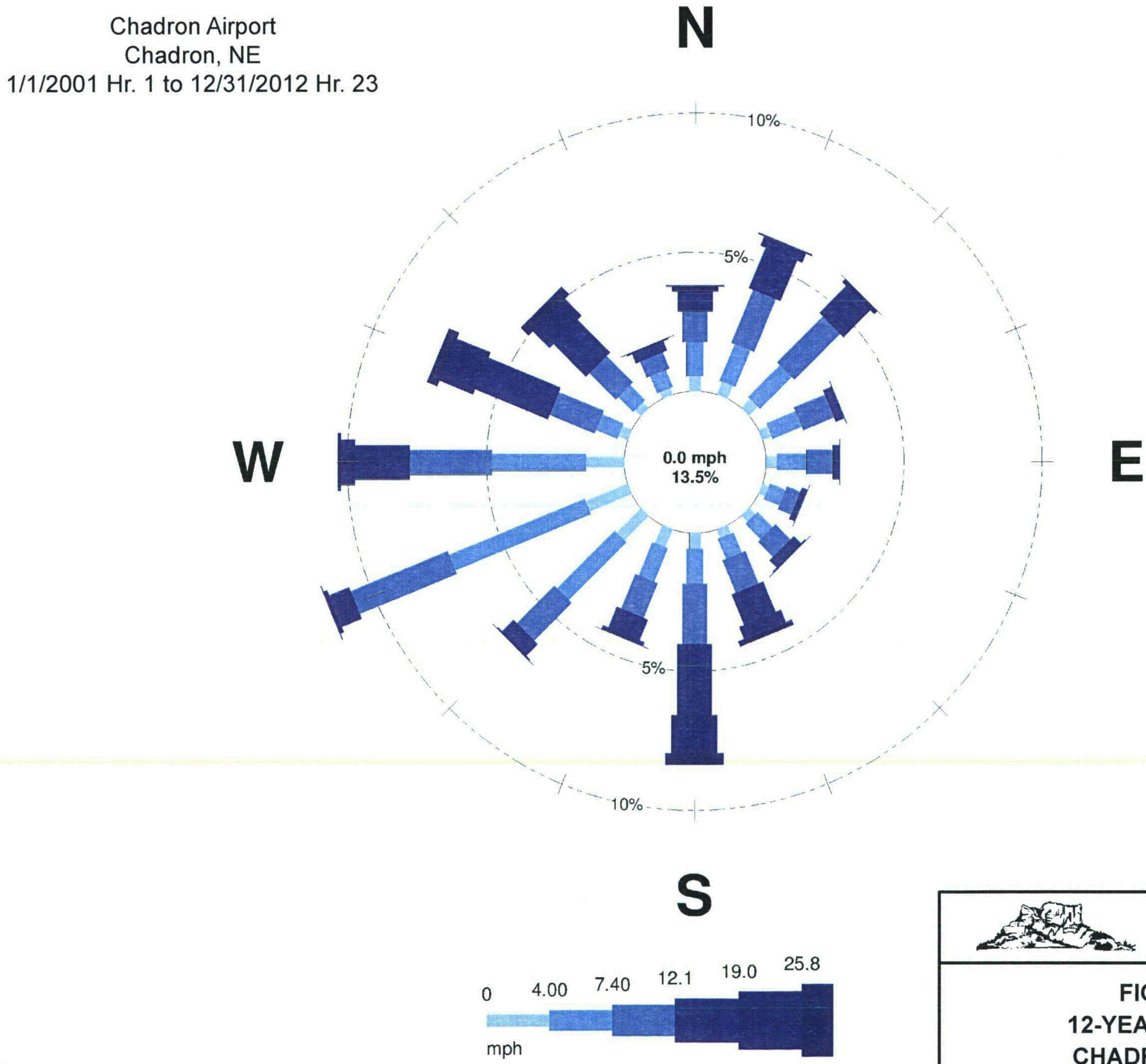


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FIGURE S-4
12-YEAR WIND ROSE
CHADRON AIRPORT

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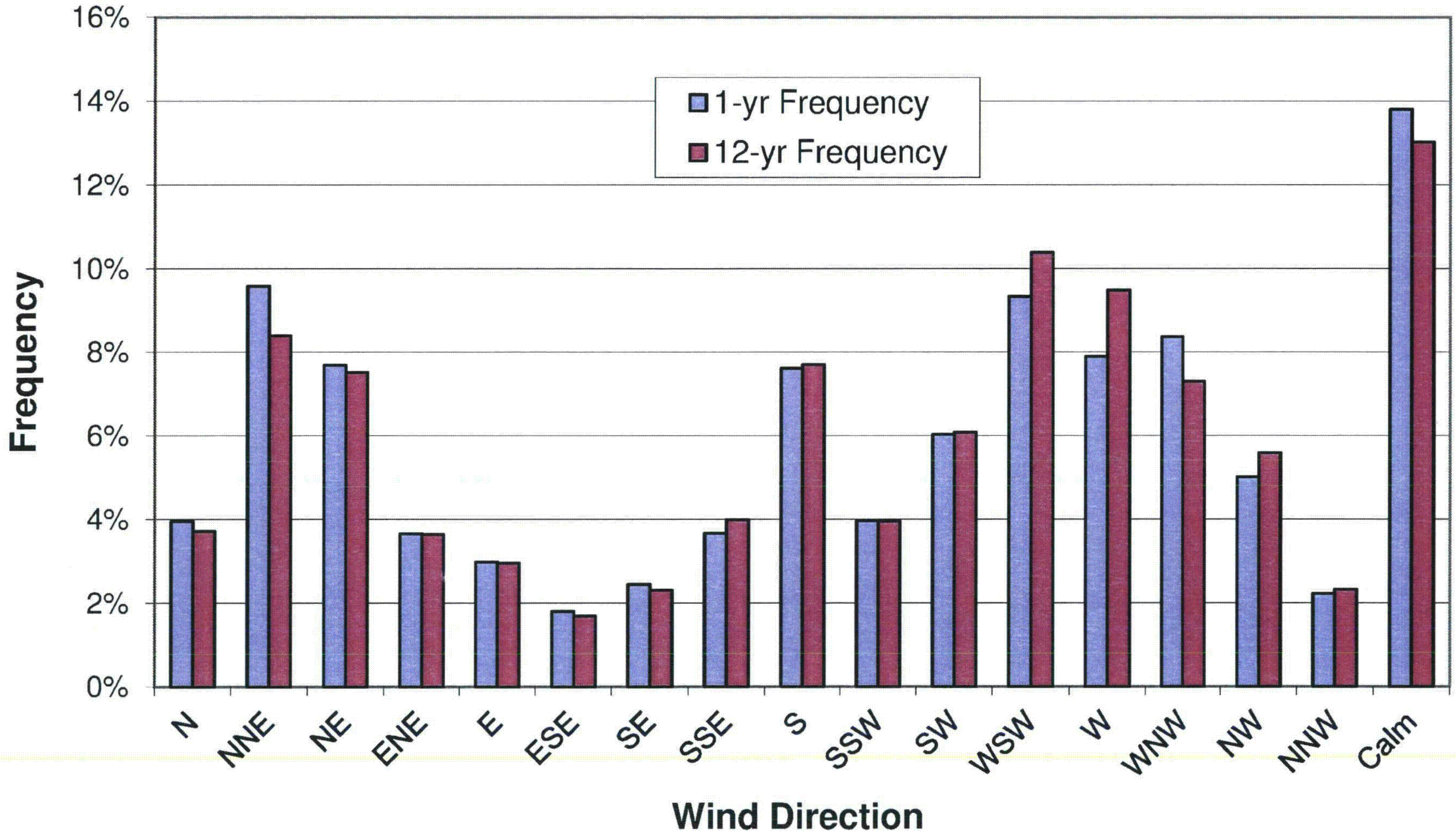
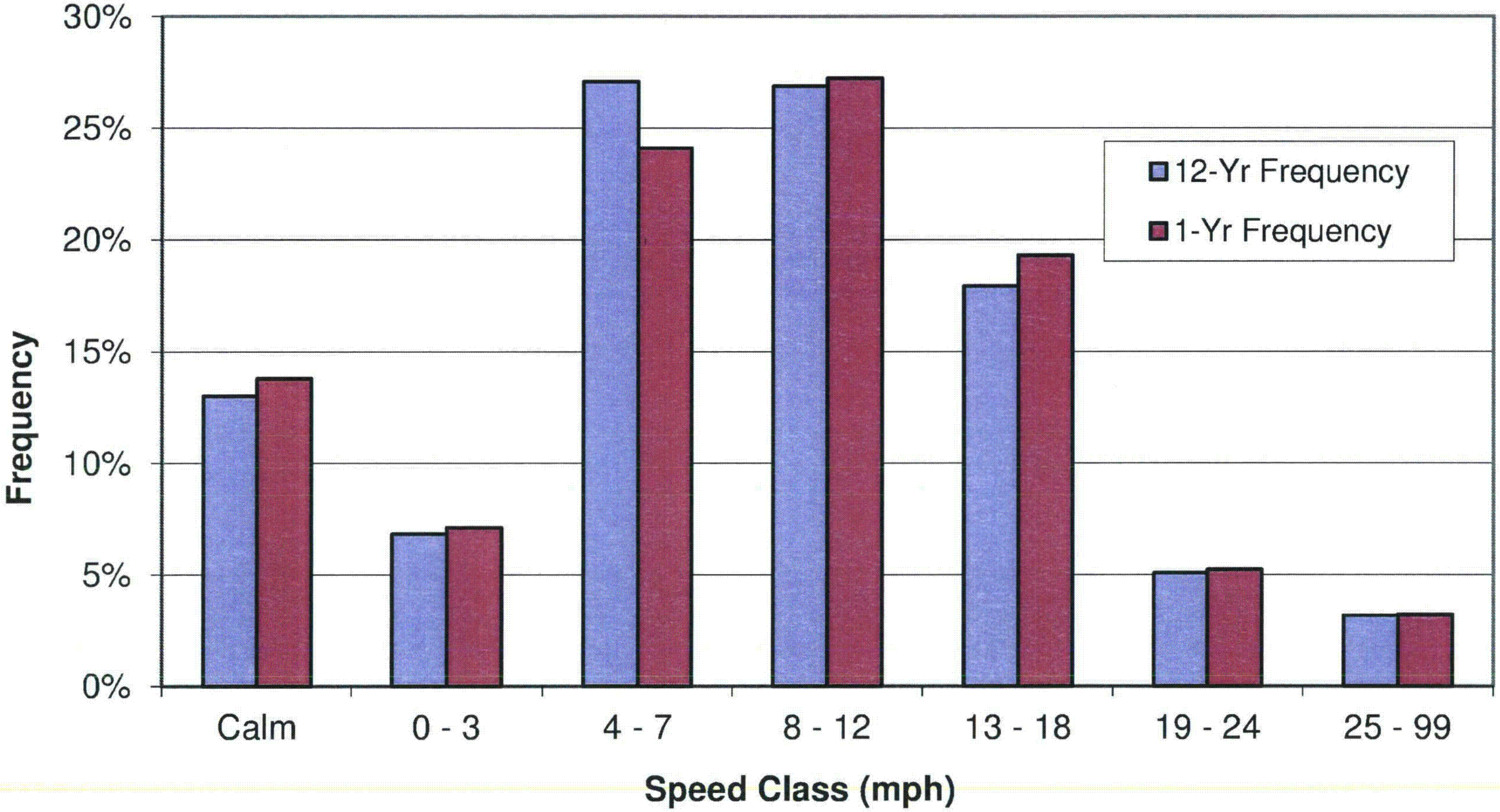


CROW BUTTE RESOURCES, INC.

FIGURE S-5
CHADRON AIRPORT
WIND DIRECTION DISTRIBUTION



K:\CBR_Projects\CO001636_Marsland\3_IMAGES\Illustrator\Appendix S-6.ai @ 03/27/2013

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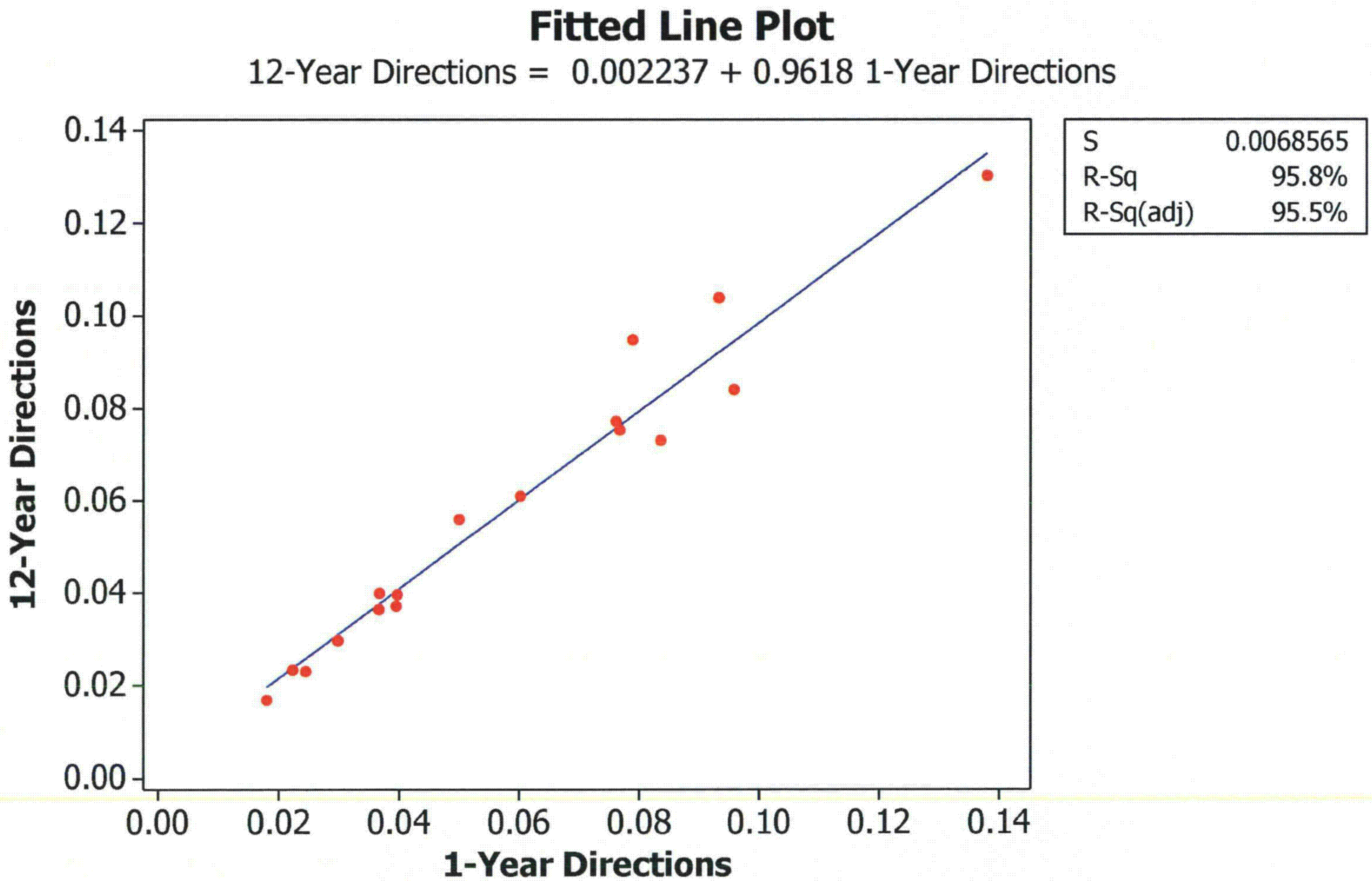
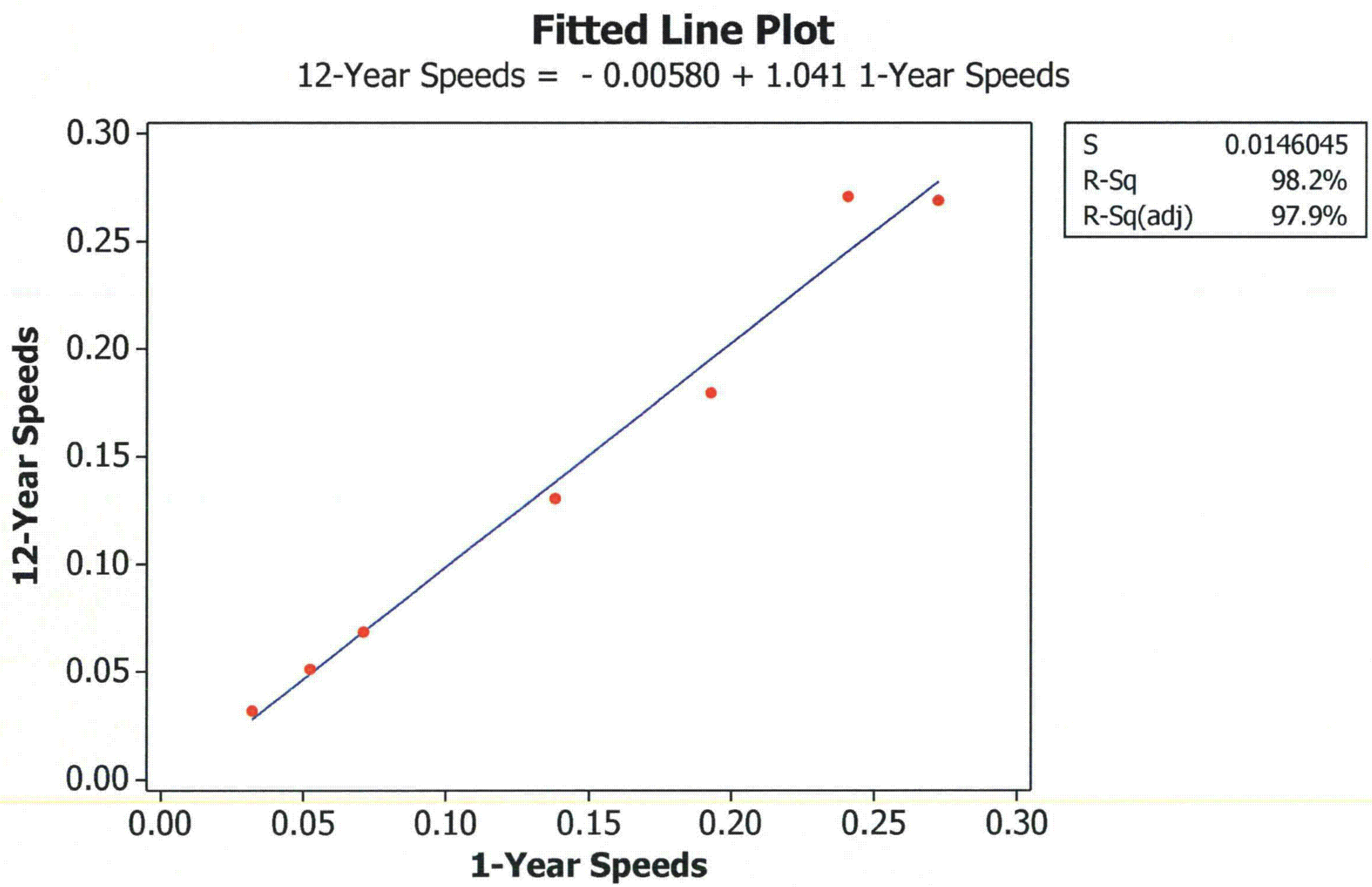
FIGURE S-6
CHADRON AIRPORT
WIND SPEED DISTRIBUTION



CROW BUTTE RESOURCES, INC.

FIGURE S-7
WIND DIRECTION CORRELATION
FOR CHADRON AIRPORT



CROW BUTTE RESOURCES, INC.

FIGURE S-8
WIND SPEED CORRELATION FOR CHADRON AIRPORT

APPENDIX T MARSLAND WATER BALANCE (PRODUCTION, RESTORATION, AND STABILIZATION SAMPLING)

	2015 Q1	2015 Q2	2015 Q3	2015 Q4	2016 Q1	2016 Q2	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3	2017 Q4
MINE UNIT 1	1100	1700	1700	1600	1500	1500	1400	1400	1300	1200	1100	1100
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 2			400	500	600	1200	1600	1700	1600	1500	1400	1400
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 3							400	500	600	1200	1600	1700
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 4											400	500
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 5												
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 6												
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 7												
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 8												
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 9												
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 10												
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 11												
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
Prod Flow	1100	1700	2100	2100	2100	2700	3400	3600	3500	3900	4500	4700
Prod Bleed 1.2%	13	20	25	25	25	32	41	43	42	47	54	56
Mine Unit 1 IX Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 1 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 2 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 3 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 4 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 5 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 6 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 7 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 8 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 9 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 10 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 11 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Total DW needed capacity	13	20	25	25	25	32	41	43	42	47	54	56
IX Flow	0	0	0	0	0	0	0	0	0	0	0	0
PERM Flow	0	0	0	0	0	0	0	0	0	0	0	0
Recirculation Flow	0	0	0	0	0	0	0	0	0	0	0	0
BRINE TO DDW	0	0	0	0	0	0	0	0	0	0	0	0
IX + RO	0	0	0	0	0	0	0	0	0	0	0	0

	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4
MINE UNIT 1	1000	900	800	700	600	500	400	400				
IX Treatment/Reinjection										800	800	800
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 2	1300	1200	1100	1100	1000	900	800	700	600	500	400	300
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 3	1600	1500	1400	1400	1300	1200	1100	1100	1000	900	800	700
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 4	600	1200	1600	1700	1600	1500	1400	1400	1300	1200	1100	1100
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 5			400	500	600	1200	1600	1700	1600	1500	1400	1400
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 6										400	500	600
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 7												
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 8												
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 9												
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 10												
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 11												
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
Prod Flow	4500	4800	5300	5400	5100	5300	5300	5300	4500	4500	4200	4100
Prod Bleed 1.2%	54	58	64	65	61	64	64	64	54	54	50	49
Mine Unit 1 IX Bleed	0	0	0	0	0	0	0	0	0	16	16	16
Mine Unit 1 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 2 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 3 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 4 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 5 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 6 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 7 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 8 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 9 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 10 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 11 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Total DW needed capacity	54	58	64	65	61	64	64	64	54	70	66	65
IX Flow	0	0	0	0	0	0	0	0	0	800	800	800
PERM Flow	0	0	0	0	0	0	0	0	0	0	0	0
Recirculation Flow	0	0	0	0	0	0	0	0	0	0	0	0
BRINE TO DDW	0	0	0	0	0	0	0	0	0	0	0	0
IX + RO	0	0	0	0	0	0	0	0	0	800	800	800

	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1	2022 Q2	2022 Q3	2022 Q4	2023 Q1	2023 Q2	2023 Q3	2023 Q4
MINE UNIT 1												
IX Treatment/Reinjection	200											
Perm	500	500	500	500	500	500	500	500	500			
Recirculation										800	800	
STABILIZATION SAMPLING												1
MINE UNIT 2												
IX Treatment/Reinjection		800	800	800	400							
Perm					250	250	250	250	250	500	500	500
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 3	600	500	400	300								
IX Treatment/Reinjection						800	800	800	800			
Perm										250	250	250
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 4	1000	900	800	700	600	500	400	300				
IX Treatment/Reinjection										400	400	400
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 5	1300	1200	1100	1100	1000	900	800	700	600	500	400	300
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 6	1200	1600	1700	1600	1500	1400	1400	1300	1200	1100	1100	1000
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 7		400	500	600	1200	1600	1700	1600	1500	1400	1400	1300
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 8						400	500	600	1200	1600	1700	1600
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 9										400	500	600
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 10												
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
MINE UNIT 11												
IX Treatment/Reinjection												
Perm												
Recirculation												
STABILIZATION SAMPLING												
Prod Flow	4100	4600	4500	4300	4300	4800	4800	4500	4500	5000	5100	4800
Prod Bleed 1.2%	49	55	54	52	52	58	58	54	54	60	61	58
Mine Unit 1 IX Bleed	4	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 1 RO Bleed	167	167	167	167	167	167	167	167	167	0	0	0
Mine Unit 2 RO Bleed	0	0	0	0	83	83	83	83	83	167	167	167
Mine Unit 3 RO Bleed	0	0	0	0	0	0	0	0	0	83	83	83
Mine Unit 4 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 5 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 6 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 7 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 8 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 9 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 10 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 11 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0
Total DW needed capacity	220	222	221	218	302	308	308	304	304	310	311	308
IX Flow	200	800	800	800	400	800	800	800	800	400	400	400
PERM Flow	500	500	500	500	750	750	750	750	750	750	750	750
Recirculation Flow	0	0	0	0	0	0	0	0	0	800	800	0
BRINE TO DDW	167	167	167	167	250	250	250	250	250	250	250	250
IX + RO	867	1467	1467	1467	1400	1800	1800	1800	1800	1400	1400	1400

	2024 Q1	2024 Q2	2024 Q3	2024 Q4	2025 Q1	2025 Q2	2025 Q3	2025 Q4	2026 Q1	2026 Q2	2026 Q3	2026 Q4	2027 Q1	2027 Q2	2027 Q3	2027 Q4
MINE UNIT 1																
IX Treatment/Reinjection																
Perm																
Recirculation																
STABILIZATION SAMPLING	1	1	1													
MINE UNIT 2																
IX Treatment/Reinjection																
Perm	500	500	500	500												
Recirculation					800	800										
STABILIZATION SAMPLING							1	1	1	1						
MINE UNIT 3																
IX Treatment/Reinjection																
Perm	250	250	250	250	500	500	500	500	500	500						
Recirculation											800	800				
STABILIZATION SAMPLING													1	1	1	1
MINE UNIT 4																
IX Treatment/Reinjection	400	400	400	400												
Perm					250	250	250	250	250	250	500	500	500	500	500	500
Recirculation																
STABILIZATION SAMPLING																
MINE UNIT 5																
IX Treatment/Reinjection		400	400	400	400	400	400	400	400	400						
Perm											250	250	250	250	250	250
Recirculation																
STABILIZATION SAMPLING																
MINE UNIT 6	900	800	700	600	500	400	300	200	200							
IX Treatment/Reinjection											400	400	400	400	400	400
Perm																
Recirculation																
STABILIZATION SAMPLING																
MINE UNIT 7	1200	1100	1100	1000	900	800	700	600	500	400	300	200	200	200	200	
IX Treatment/Reinjection																
Perm																
Recirculation																
STABILIZATION SAMPLING																
MINE UNIT 8	1500	1400	1400	1300	1200	1100	1100	1000	900	800	700	600	500	400	300	200
IX Treatment/Reinjection																
Perm																
Recirculation																
STABILIZATION SAMPLING																
MINE UNIT 9	1200	1600	1700	1600	1500	1400	1400	1300	1200	1100	1100	1000	900	800	700	600
IX Treatment/Reinjection																
Perm																
Recirculation																
STABILIZATION SAMPLING																
MINE UNIT 10		400	500	600	1200	1600	1700	1600	1500	1400	1400	1300	1200	1100	1100	1000
IX Treatment/Reinjection																
Perm																
Recirculation																
STABILIZATION SAMPLING																
MINE UNIT 11											400	500	600	1200	1600	1700
IX Treatment/Reinjection																
Perm																
Recirculation																
STABILIZATION SAMPLING																
Prod Flow	4800	5300	5400	5100	5300	5300	5200	4700	4300	3700	3900	3600	3400	3700	3900	3500
Prod Bleed 1.2%	58	64	65	61	64	64	62	56	52	44	47	43	41	44	47	42
Mine Unit 1 IX Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 1 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 2 RO Bleed	167	167	167	167	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 3 RO Bleed	83	83	83	83	167	167	167	167	167	167	0	0	0	0	0	0
Mine Unit 4 RO Bleed	0	0	0	0	83	83	83	83	83	83	167	167	167	167	167	167
Mine Unit 5 RO Bleed	0	0	0	0	0	0	0	0	0	0	83	83	83	83	83	83
Mine Unit 6 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 7 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 8 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 9 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 10 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 11 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total DW needed capacity	308	314	315	311	314	314	312	306	302	294	297	293	291	294	297	292
IX Flow	400	800	800	800	400	400	400	400	400	400	400	400	400	400	400	400
PERM Flow	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750
Recirculation Flow	0	0	0	0	800	800	0	0	0	0	800	800	0	0	0	0
BRINE TO DDW	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
IX + RO	1400	1800	1800	1800	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400

APPENDIX T MARSLAND WATER BALANCE (PRODUCTION, RESTORATION, AND STABILIZATION SAMPLING)

	2028				2029				2030				2031				2032				2033				2034				2035				2036				2037				2038				2039	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
MINE UNIT 1																																														
IX Treatment/Reinjection																																														
Perm																																														
Recirculation																																														
STABILIZATION SAMPLING																																														
MINE UNIT 2																																														
IX Treatment/Reinjection																																														
Perm																																														
Recirculation																																														
STABILIZATION SAMPLING																																														
MINE UNIT 3																																														
IX Treatment/Reinjection																																														
Perm																																														
Recirculation																																														
STABILIZATION SAMPLING																																														
MINE UNIT 4																																														
IX Treatment/Reinjection																																														
Perm																																														
Recirculation	800	800																																												
STABILIZATION SAMPLING			1	1	1	1																																								
MINE UNIT 5																																														
IX Treatment/Reinjection																																														
Perm	500	500	500	500	500	500																																								
Recirculation							800	800																																						
STABILIZATION SAMPLING									1	1	1	1																																		
MINE UNIT 6																																														
IX Treatment/Reinjection																																														
Perm	250	250	250	250	250	250	500	500	500	500	500	500																																		
Recirculation													800	800																																
STABILIZATION SAMPLING															1	1	1	1																												
MINE UNIT 7																																														
IX Treatment/Reinjection	400	400	400	400	400	400																																								
Perm							250	250	250	250	250	250	500	500	500	500	500	500																												
Recirculation																			800	800																										
STABILIZATION SAMPLING																					1	1	1	1																						
MINE UNIT 8	200	200	200	200	200																																									
IX Treatment/Reinjection							400	400	400	400	400	400																																		
Perm													250	250	250	250	250	250	500	500	500	500	500	500																						
Recirculation																									800	800																				
STABILIZATION SAMPLING																											1	1	1	1																
MINE UNIT 9	500	400	300	200	200	200	200	200	200	200	200																																			
IX Treatment/Reinjection													400	400	400	400	400	400																												
Perm																			250	250	250	250	250	250	500	500	500	500	500	500																
Recirculation																															800	800														
STABILIZATION SAMPLING																																	1	1	1	1										
MINE UNIT 10	900	800	700	600	500	400	300	200	200	200	200	200	200	200	200	200	200																													
IX Treatment/Reinjection																			400	400	400	400	400	400																						
Perm																									250	250	250	250	250	250	500	500	500	500	500	500										
Recirculation																																					800	800								
STABILIZATION SAMPLING																																							1	1	1	1				
MINE UNIT 11	1600	1500	1400	1400	1300	1200	1100	1100	1000	900	800	700	600	500	400	300	200	200	200	200	200	200	200																							
IX Treatment/Reinjection																									400	400	400	400	400	400																
Perm																															250	250	250	250	250	250	750	750	750	750						
Recirculation																																									800	800				
STABILIZATION SAMPLING																																											1	1	1	1
Prod Flow	3200	2900	2600	2400	2200	1800	1600	1500	1400	1300	1200	900	800	700	600	500	400	200	200	200	200	200	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prod Bleed 1.2%	38	35	31	29	26	22	19	18	17	16	14	11	10	8	7	6	5	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 1 IX Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 1 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 2 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 3 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 4 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 5 RO Bleed	167	167	167	167	167	167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 6 RO Bleed	83	83	83	83	83	83	167	167	167	167	167	167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 7 RO Bleed	0	0	0	0	0	0	83	83	83	83	83	83	167	167	167	167	167	167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 8 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	83	83	83	83	83	83	167	167	167	167	167	167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 9 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	83	83	83	83	83	167	167	167	167	167	167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine Unit 10 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	83	83	83	83	83	167	167	167	167	167	167	0	0	0	0	0	0	0	0	0	0
Mine Unit 11 RO Bleed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	83	83	83	83	83	250	250	250	250	0	0	0	0	0	0
Total DW needed capacity	288	285	281	279	276	272	269	268	267	266	264	261	260	258	257	256	255	252	252	252	252	252	252	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	0	0	0	0	0	0
IX Flow	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERM Flow	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	0	0	0	0	0	0
Recirculation Flow	800	800	0	0	0	0	800	800	0	0	0	0	800	800	0	0	0	0	800	800	0	0	0	0	800	800	0	0	0	0	800	800	0	0	0	0	800	800	0	0	800	800	0	0	0	0
BRINE TO DDW	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	0	0	0	0	0	0
IX + RO	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	0	0	0	0	0	0

APPENDIX T MARSLAND WATER BALANCE (PRODUCTION, RESTORATION, AND STABILIZATION SAMPLING)

			PV size	Surety PV	Flow GPM	Days	PV Needed	Total Days	91 Day Quarters			Total Gal Needed	Plan Gallons	Difference		PV Diff
MINE UNIT 1																
IX Treatment/Reinjection	MU1	IX	95017565	95017565	800	82.480525	3	247	2.72		2600	285052695.1	336960000	-51907304.9		-0.54629168
Perm	MU1	RO	95017565	95017565	500	131.96884	6	792	8.70		4500	570105390.2	583200000	-13094609.8		-0.13781252
Recirculation	MU1	RC	95017565	95017565	800	82.480525	2	165	1.81		1600	190035130.1	207360000	-17324869.9		-0.18233334
STABILIZATION SAMPLING																
MINE UNIT 2																
IX Treatment/Reinjection	MU2	IX	95017565	95017565	220	299.92918	3	900	9.89		2800	285052695.1	362880000	-77827304.9		-0.81908334
Perm	MU2	RO	95017565	95017565	225	293.26409	6	1760	19.34		4750	570105390.2	615600000	-45494609.8		-0.4788021
Recirculation	MU2	RC	95017565	95017565	400	164.96105	2	330	3.63		1600	190035130.1	207360000	-17324869.9		-0.18233334
STABILIZATION SAMPLING																
MINE UNIT 3																
IX Treatment/Reinjection	MU3	IX	95017565	95017565	220	299.92918	3	900	9.89		3200	285052695.1	414720000	-129667305		-1.36466668
Perm	MU3	RO	95017565	95017565	225	293.26409	6	1760	19.34		4750	570105390.2	615600000	-45494609.8		-0.4788021
Recirculation	MU3	RC	95017565	95017565	400	164.96105	2	330	3.63		1600	190035130.1	207360000	-17324869.9		-0.18233334
STABILIZATION SAMPLING																
MINE UNIT 4																
IX Treatment/Reinjection	MU4	IX	95017565	95017565	172	383.63035	3	1151	12.65		2800	285052695.1	362880000	-77827304.9		-0.81908334
Perm	MU4	RO	95017565	95017565	250	263.93768	6	1583.62608	17.40		4500	570105390.2	583200000	-13094609.8		-0.13781252
Recirculation	MU4	RC	95017565	95017565	400	164.96105	2	330	3.63		1600	190035130.1	207360000	-17324869.9		-0.18233334
STABILIZATION SAMPLING																
MINE UNIT 5																
IX Treatment/Reinjection	MU5	IX	95017565	95017565	350	188.52691	3	566	6.22		3600	285052695.1	466560000	-181507305		-1.91025001
Perm	MU5	RO	95017565	95017565	225	293.26409	6	1760	19.34		4500	570105390.2	583200000	-13094609.8		-0.13781252
Recirculation	MU5	RC	95017565	95017565	400	164.96105	2	330	3.63		1600	190035130.1	207360000	-17324869.9		-0.18233334
STABILIZATION SAMPLING																
MINE UNIT 6																
IX Treatment/Reinjection	MU6	IX	95017565	95017565	1000	65.98442	3	198	2.18		2400	285052695.1	311040000	-25987304.9		-0.27350001
Perm	MU6	RO	95017565	95017565	800	82.480525	6	495	5.44		4500	570105390.2	583200000	-13094609.8		-0.13781252
Recirculation	MU6	RC	95017565	95017565	400	164.96105	2	330	3.63		1600	190035130.1	207360000	-17324869.9		-0.18233334
STABILIZATION SAMPLING																
MINE UNIT 7																
IX Treatment/Reinjection	MU7	IX	95017565	95017565	1000	65.98442	3	198	2.18		2400	285052695.1	311040000	-25987304.9		-0.27350001
Perm	MU7	RO	95017565	95017565	800	82.480525	6	495	5.44		4500	570105390.2	583200000	-13094609.8		-0.13781252
Recirculation	MU7	RC	95017565	95017565	400	164.96105	2	330	3.63		1600	190035130.1	207360000	-17324869.9		-0.18233334
STABILIZATION SAMPLING																
MINE UNIT 8																
IX Treatment/Reinjection	MU8	IX	95017565	95017565	1000	65.98442	3	198	2.18		2400	285052695.1	311040000	-25987304.9		-0.27350001
Perm	MU8	RO	95017565	95017565	800	82.480525	6	495	5.44		4500	570105390.2	583200000	-13094609.8		-0.13781252
Recirculation	MU8	RC	95017565	95017565	400	164.96105	2	330	3.63		1600	190035130.1	207360000	-17324869.9		-0.18233334
STABILIZATION SAMPLING																
MINE UNIT 9																
IX Treatment/Reinjection	MU9	IX	95017565	95017565	1000	65.98442	3	198	2.18		2400	285052695.1	311040000	-25987304.9		-0.27350001
Perm	MU9	RO	95017565	95017565	800	82.480525	6	495	5.44		4500	570105390.2	583200000	-13094609.8		-0.13781252
Recirculation	MU9	RC	95017565	95017565	400	164.96105	2	330	3.63		1600	190035130.1	207360000	-17324869.9		-0.18233334
STABILIZATION SAMPLING																
MINE UNIT 10																
IX Treatment/Reinjection	MU10	IX	95017565	95017565	1000	65.98442	3	198	2.18		2400	285052695.1	311040000	-25987304.9		-0.27350001
Perm	MU10	RO	95017565	95017565	800	82.480525	6	495	5.44		4500	570105390.2	583200000	-13094609.8		-0.13781252
Recirculation	MU10	RC	95017565	95017565	400	164.96105	2	330	3.63		1600	190035130.1	207360000	-17324869.9		-0.18233334
STABILIZATION SAMPLING																
MINE UNIT 11																
IX Treatment/Reinjection	MU11	IX	95017565	95017565	1000	65.98442	3	198	2.18		2400	285052695.1	311040000	-25987304.9		-0.27350001
Perm	MU11	RO	95017565	95017565	800	82.480525	6	495	5.44		4500	570105390.2	583200000	-13094609.8		-0.13781252
Recirculation	MU11	RC	95017565	95017565	400	164.96105	2	330	3.63		1600	190035130.1	207360000	-17324869.9		-0.18233334
STABILIZATION SAMPLING																
Prod Flow																
Prod Bleed 1.2%																
Mine Unit 1 IX Bleed																
Mine Unit 1 RO Bleed																
Mine Unit 2 RO Bleed																
Mine Unit 3 RO Bleed																
Mine Unit 4 RO Bleed																
Mine Unit 5 RO Bleed																
Mine Unit 6 RO Bleed																
Mine Unit 7 RO Bleed																
Mine Unit 8 RO Bleed																
Mine Unit 9 RO Bleed																
Mine Unit 10 RO Bleed																
Mine Unit 11 RO Bleed																
Total DW needed capacity																
IX Flow																
PERM Flow																
Recirculation Flow																
BRINE TO DDW																
IX + RO																