



January 16, 2018
Project No. 2015.0171

Mr. Jim Bennett, CHG
County of San Diego
Planning and Development Services
5510 Overland Avenue
San Diego, CA 92123

MONTHLY GROUNDWATER MONITORING REPORT – NOVEMBER 2017
TULE WIND CONSTRUCTION PROJECT
EAST SAN DIEGO COUNTY, CALIFORNIA

On behalf of Avangrid Renewables, LLC (Avangrid), Geo-Logic Associates (GLA) is pleased to provide this letter presenting November 2017 daily water level data and weekly flowmeter readings from project construction-related wells (production wells 6, 6a, and 8, and piezometer PZ-1) on Rough Acres Ranch. In accordance with the requirements established in the County of San Diego Planning and Development Services in the Major Use Permit 3300 09-019, weekly groundwater production data must be recorded from wells 6, 6a and 8, and daily water level data measured in the piezometer (PZ-1) and in wells 6 and 8, when project construction is occurring. This report presents a summary of the collected data obtained in November 2017.

Following initial training by GLA on water level and flowmeter protocols for the Tule Wind construction project, daily water levels and weekly flowmeter readings are being obtained by Carol Brady with LG Equipment. Additionally, wells 6, 8, 8a and PZ-1 are each equipped with a pressure transducer to measure and record water level data, which can be uploaded to corroborate the manual measurements throughout the construction program. Well 6a is a non-community public water supply well, supplying water to Rough Acres Ranch, and a pressure transducer cannot be inserted into this well; collection of water levels in this well is not required.

Weekly Flow Meter Readings. Flowmeter readings at each well are recorded on field forms provide in Attachment 1. Well 6b is being used by Rough Acres Ranch for non-construction water for ranch purposes. In September, the water pipe from well 6b to the Ranch was damaged at two separate locations, which rendered Well 6b inoperable and resulted in Rough Acres Ranch using some water from Well 6a for non-construction ranch purposes. This amount is subtracted from the month's Tule Wind construction water meter readings. Based on the flow meter readings obtained during the November period, no water was used for the Tule Wind project during the month. Since the start of the project in December 2016, the total volume of water pumped is 51.37 acre-feet; approximately 12.76 acre-feet from Well 8 and the balance (38.62 acre-feet) from wells 6 and 6a (Attachment A – Groundwater Production Summary).

Daily Water Level Data. During the November 2017 period, water levels were measured manually in pumping Wells 6, 8, and piezometer PZ-1 each construction day and recorded on field forms (Attachment A). During prior months, when Well 8 was pumped, the water level dropped below the pressure transducer installed in this well, obstructing access, and a water level could not be measured below the pressure transducer. In lieu of measurements from Well 8, Ms. Brady measured water levels in Well 8a located 286 feet east of Well 8. With pumping discontinued at Well 8, water levels can be measured in Well 8, though water levels in Well 8a continue to be measured and recorded for reference. Table 1 presents a summary of the manual measurements obtained during the month.

Based on the production and water level data presented, the project remains within its required groundwater parameters. Beginning in June 2017, the project began ramping down its draw from the wells. The remaining groundwater as established in the MUP is being held in reserve, in the event that it is needed.

CLOSING

This monthly report pertains to the Avangrid Tule Wind Project. It may not be appropriate for other projects or for other sites. If you have any questions, please contact me.

Sincerely,
Geo-Logic Associates



Sarah J. Battelle, CHG 609
Principal Geologist

Attachments:

Table 1 – Manual Water Level Measurements
Attachment A - Weekly Groundwater Production Record

Table 1
Manual Water Level Measurements
Tule Wind Project Monitoring Wells

Well Information	Well			
	6*	PZ-1	8*	8a
Depth below TOC:				
11/18/2016	30.68	31.30	242.90	30.70
12/6/2016	106.50	30.00	156.10	30.00
12/7/2016	105.10	31.90	212.35	31.90
12/8/2016	117.10	31.20	>240	31.20
12/9/2016	123.80	33.90	>240	33.90
12/12/2016	122.30	32.20	>240	35.30
12/13/2016	125.80	32.30	>240	35.70
12/14/2016	129.40	32.40	>240	37.80
12/15/2016	128.90	32.30	>240	38.00
12/16/2016	120.30	NA	>240	NA
12/19/2016	48.50	32.30	>240	36.00
12/20/2016	NA	32.30	>240	37.30
1/4/2017	37.60	32.45	>240	31.50
1/5/2017	71.60	32.50	>240	36.00
1/6/2017	78.60	32.35	>240	35.90
1/7/2017	103.80	32.50	>240	36.50
1/9/2017	77.80	32.40	>240	34.60
1/10/2017	74.70	32.40	>240	33.30
1/11/2017	99.40	32.40	>240	33.10
1/12/2017	66.20	32.45	>240	35.10
1/16/2017	33.10	32.30	44.70	32.40
1/17/2017	118.70	32.40	>240	34.50
1/18/2017	33.80	32.40	>240	36.60
1/30/2017	38.20	31.70	25.70	32.70
1/31/2017	88.00	31.70	>240	35.80
2/1/2017	35.80	31.60	>240	35.80
2/3/2017	93.90	31.60	>240	35.70
2/6/2017	34.20	31.40	>240	34.20
2/7/2017	36.40	31.30	>240	35.70
2/8/2017	36.80	31.30	42.50	36.50
2/9/2017	37.60	31.30	>240	36.70
2/10/2017	32.30	31.30	>240	37.00
2/11/2017	34.40	31.30	>240	36.20
2/13/2017	36.20	31.30	75.80	36.70
2/14/2017	36.70	31.30	>240	37.20
2/15/2017	111.50	31.30	>240	37.20
2/16/2017	36.10	31.30	>240	38.40
2/17/2017	37.10	31.30	>240	38.50
2/20/2017	96.10	31.30	>240	38.50
2/21/2017	96.10	31.30	>240	40.10
2/22/2017	94.10	31.30	>240	40.90
2/23/2017	96.10	31.30	>240	40.90
2/24/2017	44.60	31.30	>240	41.10
2/25/2017	36.10	31.30	>240	41.70
2/27/2017	36.40	31.30	>240	42.90
2/28/2017	37.10	31.30	>240	43.30

Table 1
Manual Water Level Measurements
Tule Wind Project Monitoring Wells

Well Information	Well			
	6*	PZ-1	8*	8a
Depth below TOC:				
3/1/2017	34.10	31.40	>240	43.50
3/2/2017	34.60	31.60	>240	43.70
3/3/2017	33.10	31.50	>240	44.00
3/4/2017	39.40	31.45	>240	44.50
3/6/2017	38.50	31.50	>240	39.00
3/7/2017	34.60	31.40	>240	39.40
3/8/2017	34.90	31.40	>240	42.90
3/9/2017	35.50	31.50	>240	43.00
3/10/2017	43.80	31.50	>240	44.30
3/11/2017	38.70	31.50	>240	44.50
3/13/2017	40.10	31.50	>240	44.80
3/14/2017	39.70	31.50	>240	44.80
3/15/2017	44.00	31.60	>240	44.90
3/16/2017	33.70	31.60	>240	45.00
3/17/2017	48.20	31.60	>240	45.20
3/20/2017	44.00	31.70	>240	45.90
3/21/2017	53.10	31.70	>240	45.00
3/22/2017	46.60	31.85	>240	45.20
3/23/2017	44.00	31.90	>240	45.30
3/24/2017	36.90	31.90	>240	45.40
3/27/2017	33.80	31.90	>240	45.00
3/28/2017	36.20	32.00	>240	44.50
3/29/2017	46.20	32.00	>240	44.80
3/30/2017	44.10	32.35	>240	45.00
3/31/2017	36.80	32.40	>240	46.10
4/3/2017	36.80	32.45	55.90	46.00
4/4/2017	33.20	32.40	>240	46.50
4/5/2017	55.60	32.50	>240	45.90
4/6/2017	45.40	32.60	>240	45.40
4/7/2017	50.50	32.70	95.50	44.65
4/10/2017	37.46	32.30	64.10	42.75
4/11/2017	41.50	32.55	>240	42.00
4/12/2017	39.00	32.62	70.30	45.10
4/18/2017	32.90	32.25	43.10	40.60
4/19/2017	33.85	32.25	>240	46.10
4/20/2017	40.90	32.45	>240	48.10
4/21/2017	41.20	32.50	>240	48.40
4/22/2017	41.80	32.60	>240	48.50
4/24/2017	36.50	32.60	>240	48.70
4/25/2017	40.70	32.60	>240	49.20
4/26/2017	40.00	32.50	>240	49.60
4/27/2017	36.00	32.60	>240	49.90
4/28/2017	42.30	32.64	>240	50.30

Table 1
Manual Water Level Measurements
Tule Wind Project Monitoring Wells

Well Information	Well			
	6*	PZ-1	8*	8a
Depth below TOC:				
5/1/2017	40.20	32.70	>240	44.50
5/2/2017	46.70	32.75	>240	46.60
5/3/2017	48.80	32.75	>240	48.90
5/4/2017	45.30	32.83	>240	50.30
5/5/2017	48.90	32.80	>240	51.00
5/8/2017	45.60	32.80	>240	44.70
5/9/2017	44.70	32.86	>240	43.00
5/10/2017	43.90	32.80	40.35	42.90
5/11/2017	40.50	32.80	56.30	44.45
5/12/2017	39.80	32.80	43.30	43.00
5/15/2017	33.70	32.70	36.20	40.90
5/16/2017	33.95	32.75	>240	45.60
5/17/2017	39.60	32.75	>240	46.90
5/18/2017	41.20	32.90	>240	47.00
5/19/2017	37.60	32.80	>240	47.70
5/22/2017	45.30	32.78	47.00	43.55
5/23/2017	46.90	32.90	>240	46.27
5/24/2017	40.43	32.90	>240	48.80
5/25/2017	46.70	32.90	>240	47.00
5/31/2017	42.90	32.70	>240	43.20
6/1/2017	38.70	32.70	>240	47.00
6/2/2017	40.10	32.72	>240	47.20
6/5/2017	44.70	32.70	>240	44.00
6/6/2017	48.20	32.60	>240	44.40
6/7/2017	44.10	32.60	>240	49.20
6/8/2017	40.70	32.60	>240	49.30
6/9/2017	38.60	32.50	>240	49.80
6/12/2017	36.90	32.50	>240	50.30
6/13/2017	36.80	32.50	50.00	45.70
6/14/2017	35.70	32.40	45.70	44.30
6/15/2017	35.60	32.40	40.90	43.30
6/16/2017	33.35	32.45	35.10	42.10
6/19/2017	33.00	32.40	33.70	41.90
6/20/2017	36.80	32.40	33.30	41.00
6/21/2017	38.90	32.40	>240	42.60
6/22/2017	36.70	32.40	42.80	44.20
6/23/2017	33.90	32.20	36.30	41.10
6/26/2017	35.60	32.20	31.90	41.70
6/27/2017	33.00	32.20	31.30	42.30
6/28/2017	33.10	32.20	30.90	39.80
6/29/2017	36.40	32.20	28.80	39.80
6/30/2017	33.40	32.20	29.00	39.70
7/10/2017	33.70	32.18	29.00	37.40
7/11/2017	35.30	32.20	28.90	38.00
7/12/2017	36.10	32.20	28.70	38.00
7/13/2017	36.70	32.20	29.00	37.80
7/14/2017	38.90	32.20	28.90	35.90
7/17/2017	48.10	32.20	30.10	37.80
7/18/2017	35.30	32.18	29.60	38.10
7/19/2017	33.05	32.18	27.70	38.10
7/20/2017	34.30	32.00	26.90	37.90

Table 1
Manual Water Level Measurements
Tule Wind Project Monitoring Wells

Well Information	Well			
	6*	PZ-1	8*	8a
Depth below TOC:				
7/21/2017	34.70	32.20	26.80	37.10
7/24/2017	36.30	32.19	26.90	37.10
7/25/2017	34.40	32.20	30.20	36.80
7/26/2017	35.70	32.15	28.00	36.50
7/27/2017	38.10	32.10	26.70	35.00
7/31/2017	36.60	32.10	26.70	35.00
8/1/2017	36.10	32.20	26.50	35.10
8/2/2017	36.30	32.20	26.10	35.00
8/3/2017	36.80	32.20	25.80	34.90
8/4/2017	36.10	32.20	25.60	34.90
8/7/2017	35.30	32.20	25.30	35.00
8/8/2017	35.70	32.20	25.30	35.00
8/9/2017	36.00	32.20	25.10	35.20
8/10/2017	35.60	32.19	25.00	35.10
8/11/2017	34.90	32.20	24.80	35.00
8/14/2017	34.40	32.20	24.80	35.10
8/15/2017	33.80	32.20	24.70	35.00
8/16/2017	33.30	32.20	24.40	35.00
8/17/2017	33.40	32.20	24.40	34.90
8/18/2017	33.20	32.20	24.40	34.90
8/21/2017	33.10	32.10	23.60	34.50
8/22/2017	33.60	32.20	23.50	34.40
8/23/2017	34.00	32.20	23.40	34.30
8/24/2017	33.20	32.20	23.30	34.30
8/25/2017	33.70	32.20	23.20	34.10
8/28/2017	36.10	32.20	23.10	34.00
8/29/2017	34.40	32.20	23.00	33.90
8/30/2017	33.80	32.20	23.30	33.90
8/31/2017	33.20	32.20	23.30	33.90
9/1/2017	33.70	32.20	23.20	33.80
9/5/2017	33.50	32.25	22.50	33.45
9/6/2017	33.60	32.25	22.40	33.50
9/7/2017	37.70	32.28	22.30	33.44
9/8/2017	33.40	32.24	22.20	33.40
9/11/2017	33.60	32.20	22.30	33.30
9/12/2017	33.50	32.21	22.10	33.20
9/13/2017	33.70	32.20	21.90	32.90
9/14/2017	33.50	32.20	21.80	32.90
9/15/2017	33.30	32.21	21.70	32.80
9/18/2017	33.70	32.20	21.70	32.65
9/19/2017	37.00	32.20	21.50	32.60
9/20/2017	33.40	32.25	21.40	32.50
9/21/2017	34.10	32.24	21.40	32.55
9/22/2017	33.50	32.20	21.40	32.40
9/25/2017	34.80	32.20	21.40	32.30
9/26/2017	33.20	32.20	21.30	32.22
9/27/2017	33.30	32.20	21.30	32.23
9/28/2017	33.10	32.21	21.20	32.30
9/29/2017	32.90	32.20	21.20	32.00
10/2/2017	33.30	32.17	21.10	31.90
10/3/2017	33.24	32.17	21.10	31.90
10/4/2017	33.16	32.15	20.90	31.86

Table 1
Manual Water Level Measurements
Tule Wind Project Monitoring Wells

Well Information	Well			
	6*	PZ-1	8*	8a
Depth below TOC:				
10/5/2017	33.10	32.15	20.90	31.84
10/6/2017	33.90	32.10	20.81	31.73
10/9/2017	32.90	32.10	20.80	31.70
10/10/2017	32.80	32.10	20.70	31.70
10/11/2017	32.80	32.10	20.70	31.65
10/12/2017	32.80	32.00	20.60	31.50
10/13/2017	32.80	32.00	20.55	31.40
10/16/2017	32.80	32.00	20.50	31.40
10/17/2017	32.80	31.90	20.42	31.30
10/18/2017	32.85	31.90	20.31	31.30
10/19/2017	32.80	31.90	20.27	31.25
10/20/2017	32.60	31.90	20.25	31.20
10/23/2017	32.60	31.85	20.24	31.10
10/24/2017	32.70	31.80	20.20	31.00
10/25/2017	32.80	31.80	20.20	30.80
10/26/2017	32.84	31.80	20.20	30.64
10/27/2017	32.70	31.78	20.10	30.64
10/30/2017	32.60	31.75	20.00	30.60
10/31/2017	32.55	31.73	20.00	30.65
11/1/2017	32.60	31.70	19.90	30.60
11/2/2017	33.60	31.70	19.90	30.60
11/3/2017	32.50	31.70	19.87	30.68
11/6/2017	32.50	31.68	19.87	30.60
11/7/2017	32.50	31.60	19.87	30.62
11/8/2017	32.50	31.65	19.86	30.50
11/9/2017	32.50	31.65	19.85	30.53
11/10/2017	32.45	31.60	19.85	30.50
11/13/2017	32.28	31.50	19.85	30.42
11/14/2017	32.50	31.50	19.80	30.40
11/15/2017	32.50	31.50	19.80	30.38
11/16/2017	32.50	31.45	19.78	30.30
11/17/2017	32.45	31.45	19.75	30.30
11/20/2017	32.10	31.40	19.70	30.31
11/21/2017	32.00	31.40	19.70	30.24
11/22/2017	31.90	31.40	19.63	30.20
11/24/2017	31.80	31.30	19.61	30.20
11/27/2017	31.80	31.30	19.58	30.10
11/28/2017	31.74	31.28	19.51	30.10
11/29/2017	31.68	31.20	19.43	30.00
11/30/2017	31.61	31.20	19.38	30.00

*Production well - Water level measurements may not represent static levels.

NA - Water level could not be measured.

ATTACHMENT A

Weekly Groundwater Production Record

GROUNDWATER PRODUCTION SUMMARY						
	Piezometer PZ-1					
Date	Depth to Water					
11/18/2016	31.30		Production Summary		Total Acre Foot	
8/29/2017	32.00		WELL 6/6A	12,583,165	38.616264	
			WELL 8	4,157,055	12.757516	
			TOTAL	16,740,220	51.37378032	
Well Location:	WELL 6					
Date	Meter Reading	Date	Meter Reading	Total Gallons	Depth to Water	Comments
11/18/2016	664,935	12/20/2016	1,987,900	1,322,965	30.68	This Well feeds the Lake
12/20/2016	1,987,900	1/31/2017	2,519,800	531,900	35.8	
1/31/2017	2,519,800	2/28/2017	3,093,900	574,100	129.2	
2/28/2017	3,093,900	3/31/2017	4,716,300	1,622,400	36.8	
3/31/2017	4,716,300	4/30/2017	5,491,500	775,200		
4/30/2017	5,491,500	5/31/2017	6,221,800	730,300		
5/31/2017	6,221,800	6/30/2017	6,248,300	26,500		
6/30/2017	6,248,300	7/31/2017	6,285,500	37,200		
7/31/2017	6,285,500	8/31/2017	6,285,500	-		
8/31/2017	6,285,500	9/30/2017	6,306,200	20,700		
9/30/2017	6,306,200	10/31/2017	6,306,200			
10/31/2017	6,306,200	11/30/2017	6,306,200			

TOTAL				5,641,265		
Well Location:	WELL 6A	supplies the pond				
Date	Meter Reading	Date	Meter Reading	Total Gallons	Depth to Water	Comments
12/20/2016	31,284,500	3/25/2017	32,186,100	901,600		On September 9th the pipe that
3/25/2017	32,186,100	3/31/2017	32,737,200	551,100		supplies water to the Ranch broke
3/31/2017	32,737,200	4/30/2017	33,956,700	1,219,500		next to well house 6. The Ranch
4/30/2017	33,956,700	5/31/2017	35,366,600	1,409,900		accessed Well 6A to supply the Ranch
5/31/2017	35,366,600	6/30/2017	35,437,400	70,800		with water. On September 20th
6/30/2017	35,437,400	7/31/2017	35,482,000	44,600	Ranch Used	the pipe that supplies the Ranch
7/31/2017	35,482,000	8/31/2017	35,482,000	-	48,600 gal	broke, this time under the towers.
8/31/2017	35,482,000	9/30/2017	35,482,000	-	Meter Reading	The ranch again accessed Well 6A to
9/30/2017	35,482,000	10/31/2017	35,482,000		35530660	provide water to the ranch.
10/30/2017	35,482,000	11/30/2017	35,482,000			
TOTAL				4,197,500	35531700	
Well Location:	WELL 6A	roduction Portion				
Date	Meter Reading	Date	Meter Reading	Total Gallons	Depth to Water	Comments
12/5/2016	4,335,200	12/20/2016	4,802,700	467,500		This meter is located at the
12/20/2016	4,802,700	1/31/2017	5,163,400	360,700		one tower labeled Rough Acres
1/31/2017	5,163,400	2/28/2017	5,734,800	571,400		
2/28/2017	5,734,800	3/31/2017	6,418,200	683,400		
3/31/2017	6,418,200	4/30/2017	6,702,800	284,600		
4/30/2017	6,702,800	5/31/2017	7,057,700	354,900		
5/31/2017	7,057,700	6/30/2017	7,079,600	21,900		
6/30/2017	7,079,600	7/31/2017	7,079,600	-		
				-		
TOTAL				2,744,400		

Well Location:	WELL 8	Cubic Feet				
Date	Meter Reading	Date	Meter Reading	Total Gallons	Depth to Water	Comments
11/18/2016	1,054	12/20/2016	52,650	385,938	242.9	This Well feeds the 3 towers
12/20/2016	52,650	1/31/2017	110,360	431,671		at well 8
1/31/2017	110,360	2/28/2017	207,530	726,832		
2/28/2017	207,530	3/31/2017	372,449	1,233,594		
3/31/2017	372,449	4/30/2017	465,528	696,231		
4/30/2017	465,528	5/31/2017	532,770	502,970		
5/31/2017	532,770	6/30/2017	556,810	179,819		
6/30/2017	556,810	7/31/2017	556,810	-		
7/31/2017	556,810	8/31/2017	556,810	-		
8/31/2017	556,810	9/30/2017	556,810			
TOTAL				4,157,055		