

## **Attachment 2**

# **NUTRIENT MANAGEMENT AND CONTAINMENT SUPPORTING LETTER**





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Chief Executive Officer  
 Serpentine Jarrahdale Shire  
 6 Patterson Street  
 Mundijong WA 6123

Dear Sir,

**RE: Development Application 235 Boomerang Rd Oldbury – Supporting Information: Nutrient Management and Containment**

The landowner received written planning advice from the Shire of Serpentine Jarrahdale in July 2021. In particular, the Shire advice was concerned about the proposed development disrupting local amenity due to the potential for noise, odour, dust and pests, as well as the possibility of environmental contamination from the production of leachate.

**Background**

Terra Talis Pty Ltd are proposing to operate a manure bagging and garden product delivery business at the northern area of the site.

The bagging component of the business involves the receipt of bulk sheep manure from feedlots, which is bagged for commercial sale.

The garden product delivery component of the business involves the sale of other bagged products, which would be stored on site for loading, such as soil conditioner, potting mix, mulch, composts and firewood.

All bagged products are contained in polywoven or plastic bags and are stored on wooden pallets and wrapped in plastic.

Another business, EXO Sustain Recycling Pty Ltd, are also proposing to operate at the southern end of the site. This business collects green waste from customer addresses into a garbage wagon truck. The received green waste would be processed through a mulching machine (electric tub grinder) on site, prior to being exported to a licenced waste facility.

**Supporting Information**

The owners' intention is to conduct all manure bagging operations inside an existing shed, formerly used as a stable. To this end, the stable will be extended by the construction of an additional 52 m<sup>2</sup> roofed shed (**Appendix A**). The operation will involve trucks containing manure emptying their contents inside the shed. A bobcat will be used to progressively load the product into a hopper which supplies the bagging plant. Filled polywoven bags will then be stitched before being placed on wooden pallets and the pallets wrapped in plastic film. Such an operation, conducted entirely within a large (245 m<sup>2</sup>) roofed shed with closed doors will minimise any prospects of noise, dust or



odour impacting on neighbours. The prospect of leachate formation is negligible, as the shed roof and gutters will prevent any rainfall contacting the product.

The owners also intend to construct 625 m<sup>2</sup> impermeable floor hardstand at the rear of the manure bagging operations for the purpose of receiving domestic green waste, then putting the contents through a mill to create uniform particle size prior to exporting the material in trucks to a local licensed composting facility. To eliminate any prospect of leachate contamination, the hardstand will be composed of compacted limestone aggregate, topped with 50 mm of asphalt targeting a permeability < 10<sup>-9</sup> m/s. Any rain falling onto this hardstand will be directed by gravity into a plastic lined evaporation pond to eliminate any prospect of leachate causing groundwater pollution (**Figure 1**). The location of the hardstand is 100 m from the nearest dwelling (north west at 241 Boomerang Rd) so loss of amenity due to noise is minimal. Green waste does not pose dust or odour issues.

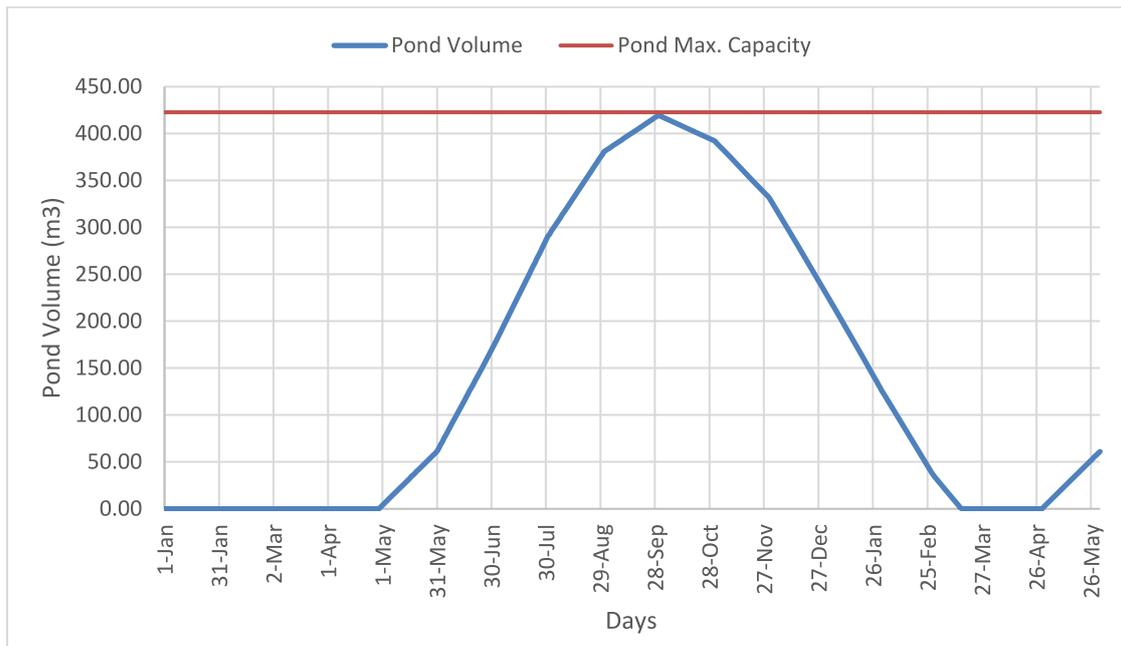
The evaporation pond was designed to manage runoff from the hardstand and rainfall directly falling into the structure. The pond will be plastic lined with an UV-resistant HDPE membrane (1 mm thick, life expectancy of 15 years). The HDPE membrane is proposed to be replaced every 15 years or when non-reparable damages are observed.

As seen in **Appendix B**, the pond will not overflow throughout the seasons hence will not cause any negative impacts to the natural environment. Specifications of the evaporation pond are provided in **Table 1** below. The pond will reach its maximum capacity late September and be entirely empty by the following March. The pond will then have volume accumulating from May when evaporation starts to be lower than rainfall (**Chart 1**). As such, since the runoff water collected in the pond will constantly be subject to evaporation, no discharge to the natural environment is therefore required. Subsequently, a treatment train system is not required.

Through the years, salt will accumulate into the pond. As such, it is proposed to collect salt every three years. Collected salt can be stored in IBCs and be dispatched to landfill when full. Collection of the salt will be done manually using a shovel (if thick layer of salt) or a broom/tray (if scarce deposits). The use of this equipment will prevent damages to the liner.

**Table 1: Evaporation pond specifications**

Description	Specs	Unit
Pond top area	470	m <sup>3</sup>
Top area - side length	21.7	m
Pond bottom area	94	m <sup>3</sup>
Bottom area - side length	9.7	m
Depth	1.5	m
Volume	423	m <sup>3</sup>
Slope	1V:4H	-



**Chart 1: Pond volume through time**

In conclusion, the manure bagging operation will be conducted under a roofed shed and hence will prevent stormwater contamination and any subsequent impacts to the environment.

Likewise, the proposed hardstand area / plastic-lined evaporation pond structures of the mill preparation area will fully contain runoff and leachate, hence preventing leaching of nutrients to the natural environment.

The proposed development will therefore not cause any environmental harms.

If further information is required, please do not hesitate to contact the undersigned.

Yours sincerely,

**Didier Alanoix**  
Environmental Scientist  
October 1, 2021



## **Appendix B: Water Balance**

**WATER BALANCE AND EVAPORATION POND DESIGN - CALCULATION SHEET**

Input

**Preamble: Harstand Area**

Description	Value	Unit
Harstand area	625	m2
Runoff coefficient	0.8	-

**Step 1: Rainfall and Evaporation Data**

Ankettel weather station

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Rainfall (mm)	17.9	16.4	20.2	45.1	95.5	137.3	150.7	127.7	86.6	42.3	31.9	14.9	790.2
Evaporation (mm)	260	224	195	114	71	54	53	71	96	146	195	245	1725
Days	31	28	31	30	31	30	31	31	30	31	30	31	365
Average daily evaporation (mm)	8.39	8.00	6.29	3.80	2.29	1.80	1.71	2.29	3.20	4.71	6.50	7.90	
Average daily rainfall (mm)	0.58	0.59	0.65	1.50	3.08	4.58	4.86	4.12	2.89	1.36	1.06	0.48	

**Step 2: Pond Sizing**

Description	Value	Unit
Pond top area	470	m2
Pond bottom area	94	m2
Depth	1.5	m
Volume	423	m3

**Step 2 (cont.): Slope Requirement**

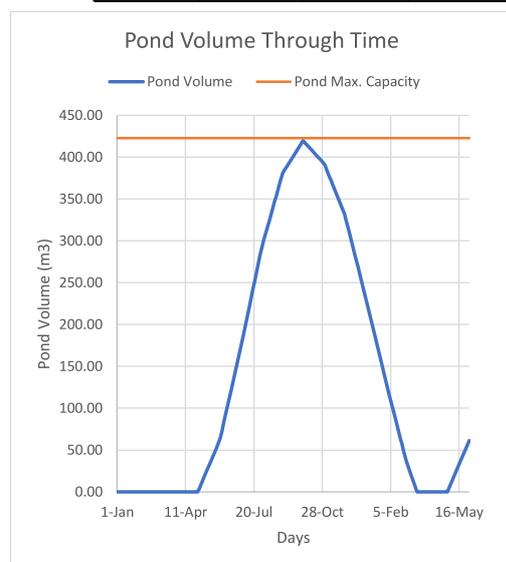
Description	Value	Unit
Slope requirement 1 V in ? H	4	-
Slope on	All	sides
Top - side length	21.7	m
Bottom - side length	9.7	m

**Step 3: Daily Water Balance**

Month	Day	Rainfall (mm)	Runoff to pond from hardstand in m3	Rainfall directly falling in pond in m3	Evaporation (mm)	Total daily volume in pond (m3)	Daily accumulated volume in pond after evaporation (m3)	Total overflow m3
Jan	1-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	2-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	3-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	4-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	5-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	6-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	7-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	8-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	9-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	10-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	11-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	12-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	13-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	14-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	15-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	16-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	17-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	18-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	19-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	20-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	21-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	22-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	23-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	24-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	25-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	26-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	27-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	28-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	29-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	30-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Jan	31-Jan	0.58	0.29	0.27	8.39	0.56	0.00	0.00
Feb	1-Feb	0.59	0.29	0.28	8.00	0.57	0.00	0.00
Feb	2-Feb	0.59	0.29	0.28	8.00	0.57	0.00	0.00
Feb	3-Feb	0.59	0.29	0.28	8.00	0.57	0.00	0.00
Feb	4-Feb	0.59	0.29	0.28	8.00	0.57	0.00	0.00
Feb	5-Feb	0.59	0.29	0.28	8.00	0.57	0.00	0.00
Feb	6-Feb	0.59	0.29	0.28	8.00	0.57	0.00	0.00
Feb	7-Feb	0.59	0.29	0.28	8.00	0.57	0.00	0.00
Feb	8-Feb	0.59	0.29	0.28	8.00	0.57	0.00	0.00

**Step 4: Outcome - Overflow from Design**

Month	Max daily overflow (m3)	Monthly overflow (m3)	Number of days with overflow
Jan	0.00	0.00	0
Feb	0.00	0.00	0
Mar	0.00	0.00	0
Apr	0.00	0.00	0
May	0.00	0.00	0
Jun	0.00	0.00	0
Jul	0.00	0.00	0
Aug	0.00	0.00	0
Sep	0.00	0.00	0
Oct	0.00	0.00	0
Nov	0.00	0.00	0
Dec	0.00	0.00	0





Apr	28-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	29-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
May	30-Apr	3.08	1.54	1.45	2.29	2.99	1.91	0.00
May	1-May	3.08	1.54	1.45	2.29	2.99	3.82	0.00
May	2-May	3.08	1.54	1.45	2.29	2.99	5.74	0.00
May	3-May	3.08	1.54	1.45	2.29	2.99	7.65	0.00
May	4-May	3.08	1.54	1.45	2.29	2.99	9.56	0.00
May	5-May	3.08	1.54	1.45	2.29	2.99	11.47	0.00
May	6-May	3.08	1.54	1.45	2.29	2.99	13.38	0.00
May	7-May	3.08	1.54	1.45	2.29	2.99	15.29	0.00
May	8-May	3.08	1.54	1.45	2.29	2.99	17.21	0.00
May	9-May	3.08	1.54	1.45	2.29	2.99	19.12	0.00
May	10-May	3.08	1.54	1.45	2.29	2.99	21.03	0.00
May	11-May	3.08	1.54	1.45	2.29	2.99	22.94	0.00
May	12-May	3.08	1.54	1.45	2.29	2.99	24.85	0.00
May	13-May	3.08	1.54	1.45	2.29	2.99	26.76	0.00
May	14-May	3.08	1.54	1.45	2.29	2.99	28.68	0.00
May	15-May	3.08	1.54	1.45	2.29	2.99	30.59	0.00
May	16-May	3.08	1.54	1.45	2.29	2.99	32.50	0.00
May	17-May	3.08	1.54	1.45	2.29	2.99	34.41	0.00
May	18-May	3.08	1.54	1.45	2.29	2.99	36.32	0.00
May	19-May	3.08	1.54	1.45	2.29	2.99	38.24	0.00
May	20-May	3.08	1.54	1.45	2.29	2.99	40.15	0.00
May	21-May	3.08	1.54	1.45	2.29	2.99	42.06	0.00
May	22-May	3.08	1.54	1.45	2.29	2.99	43.97	0.00
May	23-May	3.08	1.54	1.45	2.29	2.99	45.88	0.00
May	24-May	3.08	1.54	1.45	2.29	2.99	47.79	0.00
May	25-May	3.08	1.54	1.45	2.29	2.99	49.71	0.00
May	26-May	3.08	1.54	1.45	2.29	2.99	51.62	0.00
May	27-May	3.08	1.54	1.45	2.29	2.99	53.53	0.00
May	28-May	3.08	1.54	1.45	2.29	2.99	55.44	0.00
May	29-May	3.08	1.54	1.45	2.29	2.99	57.35	0.00
May	30-May	3.08	1.54	1.45	2.29	2.99	59.26	0.00
May	31-May	3.08	1.54	1.45	2.29	2.99	61.18	0.00
Jun	1-Jun	4.58	2.29	2.15	1.80	4.44	64.77	0.00
Jun	2-Jun	4.58	2.29	2.15	1.80	4.44	68.36	0.00
Jun	3-Jun	4.58	2.29	2.15	1.80	4.44	71.96	0.00
Jun	4-Jun	4.58	2.29	2.15	1.80	4.44	75.55	0.00
Jun	5-Jun	4.58	2.29	2.15	1.80	4.44	79.14	0.00
Jun	6-Jun	4.58	2.29	2.15	1.80	4.44	82.74	0.00
Jun	7-Jun	4.58	2.29	2.15	1.80	4.44	86.33	0.00
Jun	8-Jun	4.58	2.29	2.15	1.80	4.44	89.92	0.00
Jun	9-Jun	4.58	2.29	2.15	1.80	4.44	93.52	0.00
Jun	10-Jun	4.58	2.29	2.15	1.80	4.44	97.11	0.00
Jun	11-Jun	4.58	2.29	2.15	1.80	4.44	100.70	0.00
Jun	12-Jun	4.58	2.29	2.15	1.80	4.44	104.30	0.00
Jun	13-Jun	4.58	2.29	2.15	1.80	4.44	107.89	0.00
Jun	14-Jun	4.58	2.29	2.15	1.80	4.44	111.48	0.00
Jun	15-Jun	4.58	2.29	2.15	1.80	4.44	115.08	0.00
Jun	16-Jun	4.58	2.29	2.15	1.80	4.44	118.67	0.00
Jun	17-Jun	4.58	2.29	2.15	1.80	4.44	122.26	0.00
Jun	18-Jun	4.58	2.29	2.15	1.80	4.44	125.86	0.00
Jun	19-Jun	4.58	2.29	2.15	1.80	4.44	129.45	0.00
Jun	20-Jun	4.58	2.29	2.15	1.80	4.44	133.04	0.00
Jun	21-Jun	4.58	2.29	2.15	1.80	4.44	136.64	0.00
Jun	22-Jun	4.58	2.29	2.15	1.80	4.44	140.23	0.00
Jun	23-Jun	4.58	2.29	2.15	1.80	4.44	143.82	0.00
Jun	24-Jun	4.58	2.29	2.15	1.80	4.44	147.42	0.00
Jun	25-Jun	4.58	2.29	2.15	1.80	4.44	151.01	0.00
Jun	26-Jun	4.58	2.29	2.15	1.80	4.44	154.60	0.00
Jun	27-Jun	4.58	2.29	2.15	1.80	4.44	158.20	0.00
Jun	28-Jun	4.58	2.29	2.15	1.80	4.44	161.79	0.00
Jun	29-Jun	4.58	2.29	2.15	1.80	4.44	165.38	0.00
Jun	30-Jun	4.58	2.29	2.15	1.80	4.44	168.98	0.00
Jul	1-Jul	4.86	2.43	2.28	1.71	4.72	172.89	0.00
Jul	2-Jul	4.86	2.43	2.28	1.71	4.72	176.80	0.00
Jul	3-Jul	4.86	2.43	2.28	1.71	4.72	180.71	0.00
Jul	4-Jul	4.86	2.43	2.28	1.71	4.72	184.63	0.00
Jul	5-Jul	4.86	2.43	2.28	1.71	4.72	188.54	0.00
Jul	6-Jul	4.86	2.43	2.28	1.71	4.72	192.45	0.00
Jul	7-Jul	4.86	2.43	2.28	1.71	4.72	196.36	0.00
Jul	8-Jul	4.86	2.43	2.28	1.71	4.72	200.27	0.00
Jul	9-Jul	4.86	2.43	2.28	1.71	4.72	204.18	0.00
Jul	10-Jul	4.86	2.43	2.28	1.71	4.72	208.10	0.00
Jul	11-Jul	4.86	2.43	2.28	1.71	4.72	212.01	0.00
Jul	12-Jul	4.86	2.43	2.28	1.71	4.72	215.92	0.00
Jul	13-Jul	4.86	2.43	2.28	1.71	4.72	219.83	0.00
Jul	14-Jul	4.86	2.43	2.28	1.71	4.72	223.74	0.00

Jul	15-Jul	4.86	2.43	2.28	1.71	4.72	227.66	0.00
Jul	16-Jul	4.86	2.43	2.28	1.71	4.72	231.57	0.00
Jul	17-Jul	4.86	2.43	2.28	1.71	4.72	235.48	0.00
Jul	18-Jul	4.86	2.43	2.28	1.71	4.72	239.39	0.00
Jul	19-Jul	4.86	2.43	2.28	1.71	4.72	243.30	0.00
Jul	20-Jul	4.86	2.43	2.28	1.71	4.72	247.22	0.00
Jul	21-Jul	4.86	2.43	2.28	1.71	4.72	251.13	0.00
Jul	22-Jul	4.86	2.43	2.28	1.71	4.72	255.04	0.00
Jul	23-Jul	4.86	2.43	2.28	1.71	4.72	258.95	0.00
Jul	24-Jul	4.86	2.43	2.28	1.71	4.72	262.86	0.00
Jul	25-Jul	4.86	2.43	2.28	1.71	4.72	266.78	0.00
Jul	26-Jul	4.86	2.43	2.28	1.71	4.72	270.69	0.00
Jul	27-Jul	4.86	2.43	2.28	1.71	4.72	274.60	0.00
Jul	28-Jul	4.86	2.43	2.28	1.71	4.72	278.51	0.00
Jul	29-Jul	4.86	2.43	2.28	1.71	4.72	282.42	0.00
Jul	30-Jul	4.86	2.43	2.28	1.71	4.72	286.33	0.00
Jul	31-Jul	4.86	2.43	2.28	1.71	4.72	290.25	0.00
Aug	1-Aug	4.12	2.06	1.94	2.29	4.00	293.17	0.00
Aug	2-Aug	4.12	2.06	1.94	2.29	4.00	296.09	0.00
Aug	3-Aug	4.12	2.06	1.94	2.29	4.00	299.00	0.00
Aug	4-Aug	4.12	2.06	1.94	2.29	4.00	301.92	0.00
Aug	5-Aug	4.12	2.06	1.94	2.29	4.00	304.84	0.00
Aug	6-Aug	4.12	2.06	1.94	2.29	4.00	307.76	0.00
Aug	7-Aug	4.12	2.06	1.94	2.29	4.00	310.68	0.00
Aug	8-Aug	4.12	2.06	1.94	2.29	4.00	313.60	0.00
Aug	9-Aug	4.12	2.06	1.94	2.29	4.00	316.52	0.00
Aug	10-Aug	4.12	2.06	1.94	2.29	4.00	319.44	0.00
Aug	11-Aug	4.12	2.06	1.94	2.29	4.00	322.36	0.00
Aug	12-Aug	4.12	2.06	1.94	2.29	4.00	325.28	0.00
Aug	13-Aug	4.12	2.06	1.94	2.29	4.00	328.20	0.00
Aug	14-Aug	4.12	2.06	1.94	2.29	4.00	331.12	0.00
Aug	15-Aug	4.12	2.06	1.94	2.29	4.00	334.04	0.00
Aug	16-Aug	4.12	2.06	1.94	2.29	4.00	336.96	0.00
Aug	17-Aug	4.12	2.06	1.94	2.29	4.00	339.88	0.00
Aug	18-Aug	4.12	2.06	1.94	2.29	4.00	342.79	0.00
Aug	19-Aug	4.12	2.06	1.94	2.29	4.00	345.71	0.00
Aug	20-Aug	4.12	2.06	1.94	2.29	4.00	348.63	0.00
Aug	21-Aug	4.12	2.06	1.94	2.29	4.00	351.55	0.00
Aug	22-Aug	4.12	2.06	1.94	2.29	4.00	354.47	0.00
Aug	23-Aug	4.12	2.06	1.94	2.29	4.00	357.39	0.00
Aug	24-Aug	4.12	2.06	1.94	2.29	4.00	360.31	0.00
Aug	25-Aug	4.12	2.06	1.94	2.29	4.00	363.23	0.00
Aug	26-Aug	4.12	2.06	1.94	2.29	4.00	366.15	0.00
Aug	27-Aug	4.12	2.06	1.94	2.29	4.00	369.07	0.00
Aug	28-Aug	4.12	2.06	1.94	2.29	4.00	371.99	0.00
Aug	29-Aug	4.12	2.06	1.94	2.29	4.00	374.91	0.00
Aug	30-Aug	4.12	2.06	1.94	2.29	4.00	377.83	0.00
Aug	31-Aug	4.12	2.06	1.94	2.29	4.00	380.75	0.00
Sep	1-Sep	2.89	1.44	1.36	3.20	2.80	382.04	0.00
Sep	2-Sep	2.89	1.44	1.36	3.20	2.80	383.34	0.00
Sep	3-Sep	2.89	1.44	1.36	3.20	2.80	384.63	0.00
Sep	4-Sep	2.89	1.44	1.36	3.20	2.80	385.93	0.00
Sep	5-Sep	2.89	1.44	1.36	3.20	2.80	387.23	0.00
Sep	6-Sep	2.89	1.44	1.36	3.20	2.80	388.52	0.00
Sep	7-Sep	2.89	1.44	1.36	3.20	2.80	389.82	0.00
Sep	8-Sep	2.89	1.44	1.36	3.20	2.80	391.11	0.00
Sep	9-Sep	2.89	1.44	1.36	3.20	2.80	392.41	0.00
Sep	10-Sep	2.89	1.44	1.36	3.20	2.80	393.71	0.00
Sep	11-Sep	2.89	1.44	1.36	3.20	2.80	395.00	0.00
Sep	12-Sep	2.89	1.44	1.36	3.20	2.80	396.30	0.00
Sep	13-Sep	2.89	1.44	1.36	3.20	2.80	397.59	0.00
Sep	14-Sep	2.89	1.44	1.36	3.20	2.80	398.89	0.00
Sep	15-Sep	2.89	1.44	1.36	3.20	2.80	400.19	0.00
Sep	16-Sep	2.89	1.44	1.36	3.20	2.80	401.48	0.00
Sep	17-Sep	2.89	1.44	1.36	3.20	2.80	402.78	0.00
Sep	18-Sep	2.89	1.44	1.36	3.20	2.80	404.07	0.00
Sep	19-Sep	2.89	1.44	1.36	3.20	2.80	405.37	0.00
Sep	20-Sep	2.89	1.44	1.36	3.20	2.80	406.67	0.00
Sep	21-Sep	2.89	1.44	1.36	3.20	2.80	407.96	0.00
Sep	22-Sep	2.89	1.44	1.36	3.20	2.80	409.26	0.00
Sep	23-Sep	2.89	1.44	1.36	3.20	2.80	410.56	0.00
Sep	24-Sep	2.89	1.44	1.36	3.20	2.80	411.85	0.00
Sep	25-Sep	2.89	1.44	1.36	3.20	2.80	413.15	0.00
Sep	26-Sep	2.89	1.44	1.36	3.20	2.80	414.44	0.00
Sep	27-Sep	2.89	1.44	1.36	3.20	2.80	415.74	0.00
Sep	28-Sep	2.89	1.44	1.36	3.20	2.80	417.04	0.00
Sep	29-Sep	2.89	1.44	1.36	3.20	2.80	418.33	0.00
Sep	30-Sep	2.89	1.44	1.36	3.20	2.80	419.63	0.00

Oct	1-Oct	1.36	0.68	0.64	4.71	1.32	418.74	0.00
Oct	2-Oct	1.36	0.68	0.64	4.71	1.32	417.85	0.00
Oct	3-Oct	1.36	0.68	0.64	4.71	1.32	416.96	0.00
Oct	4-Oct	1.36	0.68	0.64	4.71	1.32	416.07	0.00
Oct	5-Oct	1.36	0.68	0.64	4.71	1.32	415.18	0.00
Oct	6-Oct	1.36	0.68	0.64	4.71	1.32	414.29	0.00
Oct	7-Oct	1.36	0.68	0.64	4.71	1.32	413.40	0.00
Oct	8-Oct	1.36	0.68	0.64	4.71	1.32	412.51	0.00
Oct	9-Oct	1.36	0.68	0.64	4.71	1.32	411.62	0.00
Oct	10-Oct	1.36	0.68	0.64	4.71	1.32	410.73	0.00
Oct	11-Oct	1.36	0.68	0.64	4.71	1.32	409.84	0.00
Oct	12-Oct	1.36	0.68	0.64	4.71	1.32	408.95	0.00
Oct	13-Oct	1.36	0.68	0.64	4.71	1.32	408.06	0.00
Oct	14-Oct	1.36	0.68	0.64	4.71	1.32	407.17	0.00
Oct	15-Oct	1.36	0.68	0.64	4.71	1.32	406.28	0.00
Oct	16-Oct	1.36	0.68	0.64	4.71	1.32	405.39	0.00
Oct	17-Oct	1.36	0.68	0.64	4.71	1.32	404.50	0.00
Oct	18-Oct	1.36	0.68	0.64	4.71	1.32	403.61	0.00
Oct	19-Oct	1.36	0.68	0.64	4.71	1.32	402.72	0.00
Oct	20-Oct	1.36	0.68	0.64	4.71	1.32	401.83	0.00
Oct	21-Oct	1.36	0.68	0.64	4.71	1.32	400.94	0.00
Oct	22-Oct	1.36	0.68	0.64	4.71	1.32	400.05	0.00
Oct	23-Oct	1.36	0.68	0.64	4.71	1.32	399.16	0.00
Oct	24-Oct	1.36	0.68	0.64	4.71	1.32	398.27	0.00
Oct	25-Oct	1.36	0.68	0.64	4.71	1.32	397.38	0.00
Oct	26-Oct	1.36	0.68	0.64	4.71	1.32	396.49	0.00
Oct	27-Oct	1.36	0.68	0.64	4.71	1.32	395.60	0.00
Oct	28-Oct	1.36	0.68	0.64	4.71	1.32	394.71	0.00
Oct	29-Oct	1.36	0.68	0.64	4.71	1.32	393.82	0.00
Oct	30-Oct	1.36	0.68	0.64	4.71	1.32	392.93	0.00
Oct	31-Oct	1.36	0.68	0.64	4.71	1.32	392.04	0.00
Nov	1-Nov	1.06	0.53	0.50	6.50	1.03	390.02	0.00
Nov	2-Nov	1.06	0.53	0.50	6.50	1.03	387.99	0.00
Nov	3-Nov	1.06	0.53	0.50	6.50	1.03	385.97	0.00
Nov	4-Nov	1.06	0.53	0.50	6.50	1.03	383.94	0.00
Nov	5-Nov	1.06	0.53	0.50	6.50	1.03	381.92	0.00
Nov	6-Nov	1.06	0.53	0.50	6.50	1.03	379.90	0.00
Nov	7-Nov	1.06	0.53	0.50	6.50	1.03	377.87	0.00
Nov	8-Nov	1.06	0.53	0.50	6.50	1.03	375.85	0.00
Nov	9-Nov	1.06	0.53	0.50	6.50	1.03	373.83	0.00
Nov	10-Nov	1.06	0.53	0.50	6.50	1.03	371.80	0.00
Nov	11-Nov	1.06	0.53	0.50	6.50	1.03	369.78	0.00
Nov	12-Nov	1.06	0.53	0.50	6.50	1.03	367.76	0.00
Nov	13-Nov	1.06	0.53	0.50	6.50	1.03	365.73	0.00
Nov	14-Nov	1.06	0.53	0.50	6.50	1.03	363.71	0.00
Nov	15-Nov	1.06	0.53	0.50	6.50	1.03	361.69	0.00
Nov	16-Nov	1.06	0.53	0.50	6.50	1.03	359.66	0.00
Nov	17-Nov	1.06	0.53	0.50	6.50	1.03	357.64	0.00
Nov	18-Nov	1.06	0.53	0.50	6.50	1.03	355.61	0.00
Nov	19-Nov	1.06	0.53	0.50	6.50	1.03	353.59	0.00
Nov	20-Nov	1.06	0.53	0.50	6.50	1.03	351.57	0.00
Nov	21-Nov	1.06	0.53	0.50	6.50	1.03	349.54	0.00
Nov	22-Nov	1.06	0.53	0.50	6.50	1.03	347.52	0.00
Nov	23-Nov	1.06	0.53	0.50	6.50	1.03	345.50	0.00
Nov	24-Nov	1.06	0.53	0.50	6.50	1.03	343.47	0.00
Nov	25-Nov	1.06	0.53	0.50	6.50	1.03	341.45	0.00
Nov	26-Nov	1.06	0.53	0.50	6.50	1.03	339.43	0.00
Nov	27-Nov	1.06	0.53	0.50	6.50	1.03	337.40	0.00
Nov	28-Nov	1.06	0.53	0.50	6.50	1.03	335.38	0.00
Nov	29-Nov	1.06	0.53	0.50	6.50	1.03	333.36	0.00
Nov	30-Nov	1.06	0.53	0.50	6.50	1.03	331.33	0.00
Dec	1-Dec	0.48	0.24	0.23	7.90	0.47	328.08	0.00
Dec	2-Dec	0.48	0.24	0.23	7.90	0.47	324.84	0.00
Dec	3-Dec	0.48	0.24	0.23	7.90	0.47	321.59	0.00
Dec	4-Dec	0.48	0.24	0.23	7.90	0.47	318.34	0.00
Dec	5-Dec	0.48	0.24	0.23	7.90	0.47	315.09	0.00
Dec	6-Dec	0.48	0.24	0.23	7.90	0.47	311.84	0.00
Dec	7-Dec	0.48	0.24	0.23	7.90	0.47	308.59	0.00
Dec	8-Dec	0.48	0.24	0.23	7.90	0.47	305.35	0.00
Dec	9-Dec	0.48	0.24	0.23	7.90	0.47	302.10	0.00
Dec	10-Dec	0.48	0.24	0.23	7.90	0.47	298.85	0.00
Dec	11-Dec	0.48	0.24	0.23	7.90	0.47	295.60	0.00
Dec	12-Dec	0.48	0.24	0.23	7.90	0.47	292.35	0.00
Dec	13-Dec	0.48	0.24	0.23	7.90	0.47	289.10	0.00
Dec	14-Dec	0.48	0.24	0.23	7.90	0.47	285.86	0.00
Dec	15-Dec	0.48	0.24	0.23	7.90	0.47	282.61	0.00
Dec	16-Dec	0.48	0.24	0.23	7.90	0.47	279.36	0.00
Dec	17-Dec	0.48	0.24	0.23	7.90	0.47	276.11	0.00

Dec	18-Dec	0.48	0.24	0.23	7.90	0.47	272.86	0.00
Dec	19-Dec	0.48	0.24	0.23	7.90	0.47	269.61	0.00
Dec	20-Dec	0.48	0.24	0.23	7.90	0.47	266.37	0.00
Dec	21-Dec	0.48	0.24	0.23	7.90	0.47	263.12	0.00
Dec	22-Dec	0.48	0.24	0.23	7.90	0.47	259.87	0.00
Dec	23-Dec	0.48	0.24	0.23	7.90	0.47	256.62	0.00
Dec	24-Dec	0.48	0.24	0.23	7.90	0.47	253.37	0.00
Dec	25-Dec	0.48	0.24	0.23	7.90	0.47	250.12	0.00
Dec	26-Dec	0.48	0.24	0.23	7.90	0.47	246.88	0.00
Dec	27-Dec	0.48	0.24	0.23	7.90	0.47	243.63	0.00
Dec	28-Dec	0.48	0.24	0.23	7.90	0.47	240.38	0.00
Dec	29-Dec	0.48	0.24	0.23	7.90	0.47	237.13	0.00
Dec	30-Dec	0.48	0.24	0.23	7.90	0.47	233.88	0.00
Dec	31-Dec	0.48	0.24	0.23	7.90	0.47	230.63	0.00
Jan	1-Jan	0.58	0.29	0.27	8.39	0.56	227.25	0.00
Jan	2-Jan	0.58	0.29	0.27	8.39	0.56	223.87	0.00
Jan	3-Jan	0.58	0.29	0.27	8.39	0.56	220.49	0.00
Jan	4-Jan	0.58	0.29	0.27	8.39	0.56	217.11	0.00
Jan	5-Jan	0.58	0.29	0.27	8.39	0.56	213.73	0.00
Jan	6-Jan	0.58	0.29	0.27	8.39	0.56	210.34	0.00
Jan	7-Jan	0.58	0.29	0.27	8.39	0.56	206.96	0.00
Jan	8-Jan	0.58	0.29	0.27	8.39	0.56	203.58	0.00
Jan	9-Jan	0.58	0.29	0.27	8.39	0.56	200.20	0.00
Jan	10-Jan	0.58	0.29	0.27	8.39	0.56	196.82	0.00
Jan	11-Jan	0.58	0.29	0.27	8.39	0.56	193.43	0.00
Jan	12-Jan	0.58	0.29	0.27	8.39	0.56	190.05	0.00
Jan	13-Jan	0.58	0.29	0.27	8.39	0.56	186.67	0.00
Jan	14-Jan	0.58	0.29	0.27	8.39	0.56	183.29	0.00
Jan	15-Jan	0.58	0.29	0.27	8.39	0.56	179.91	0.00
Jan	16-Jan	0.58	0.29	0.27	8.39	0.56	176.53	0.00
Jan	17-Jan	0.58	0.29	0.27	8.39	0.56	173.14	0.00
Jan	18-Jan	0.58	0.29	0.27	8.39	0.56	169.76	0.00
Jan	19-Jan	0.58	0.29	0.27	8.39	0.56	166.38	0.00
Jan	20-Jan	0.58	0.29	0.27	8.39	0.56	163.00	0.00
Jan	21-Jan	0.58	0.29	0.27	8.39	0.56	159.62	0.00
Jan	22-Jan	0.58	0.29	0.27	8.39	0.56	156.23	0.00
Jan	23-Jan	0.58	0.29	0.27	8.39	0.56	152.85	0.00
Jan	24-Jan	0.58	0.29	0.27	8.39	0.56	149.47	0.00
Jan	25-Jan	0.58	0.29	0.27	8.39	0.56	146.09	0.00
Jan	26-Jan	0.58	0.29	0.27	8.39	0.56	142.71	0.00
Jan	27-Jan	0.58	0.29	0.27	8.39	0.56	139.33	0.00
Jan	28-Jan	0.58	0.29	0.27	8.39	0.56	135.94	0.00
Jan	29-Jan	0.58	0.29	0.27	8.39	0.56	132.56	0.00
Jan	30-Jan	0.58	0.29	0.27	8.39	0.56	129.18	0.00
Jan	31-Jan	0.58	0.29	0.27	8.39	0.56	125.80	0.00
Feb	1-Feb	0.59	0.29	0.28	8.00	0.57	122.61	0.00
Feb	2-Feb	0.59	0.29	0.28	8.00	0.57	119.41	0.00
Feb	3-Feb	0.59	0.29	0.28	8.00	0.57	116.22	0.00
Feb	4-Feb	0.59	0.29	0.28	8.00	0.57	113.03	0.00
Feb	5-Feb	0.59	0.29	0.28	8.00	0.57	109.84	0.00
Feb	6-Feb	0.59	0.29	0.28	8.00	0.57	106.65	0.00
Feb	7-Feb	0.59	0.29	0.28	8.00	0.57	103.45	0.00
Feb	8-Feb	0.59	0.29	0.28	8.00	0.57	100.26	0.00
Feb	9-Feb	0.59	0.29	0.28	8.00	0.57	97.07	0.00
Feb	10-Feb	0.59	0.29	0.28	8.00	0.57	93.88	0.00
Feb	11-Feb	0.59	0.29	0.28	8.00	0.57	90.69	0.00
Feb	12-Feb	0.59	0.29	0.28	8.00	0.57	87.50	0.00
Feb	13-Feb	0.59	0.29	0.28	8.00	0.57	84.30	0.00
Feb	14-Feb	0.59	0.29	0.28	8.00	0.57	81.11	0.00
Feb	15-Feb	0.59	0.29	0.28	8.00	0.57	77.92	0.00
Feb	16-Feb	0.59	0.29	0.28	8.00	0.57	74.73	0.00
Feb	17-Feb	0.59	0.29	0.28	8.00	0.57	71.54	0.00
Feb	18-Feb	0.59	0.29	0.28	8.00	0.57	68.34	0.00
Feb	19-Feb	0.59	0.29	0.28	8.00	0.57	65.15	0.00
Feb	20-Feb	0.59	0.29	0.28	8.00	0.57	61.96	0.00
Feb	21-Feb	0.59	0.29	0.28	8.00	0.57	58.77	0.00
Feb	22-Feb	0.59	0.29	0.28	8.00	0.57	55.58	0.00
Feb	23-Feb	0.59	0.29	0.28	8.00	0.57	52.39	0.00
Feb	24-Feb	0.59	0.29	0.28	8.00	0.57	49.19	0.00
Feb	25-Feb	0.59	0.29	0.28	8.00	0.57	46.00	0.00
Feb	26-Feb	0.59	0.29	0.28	8.00	0.57	42.81	0.00
Feb	27-Feb	0.59	0.29	0.28	8.00	0.57	39.62	0.00
Feb	28-Feb	0.59	0.29	0.28	8.00	0.57	36.43	0.00
Mar	1-Mar	0.65	0.33	0.31	6.29	0.63	34.10	0.00
Mar	2-Mar	0.65	0.33	0.31	6.29	0.63	31.78	0.00
Mar	3-Mar	0.65	0.33	0.31	6.29	0.63	29.45	0.00
Mar	4-Mar	0.65	0.33	0.31	6.29	0.63	27.13	0.00
Mar	5-Mar	0.65	0.33	0.31	6.29	0.63	24.80	0.00

Mar	6-Mar	0.65	0.33	0.31	6.29	0.63	22.48	0.00
Mar	7-Mar	0.65	0.33	0.31	6.29	0.63	20.16	0.00
Mar	8-Mar	0.65	0.33	0.31	6.29	0.63	17.83	0.00
Mar	9-Mar	0.65	0.33	0.31	6.29	0.63	15.51	0.00
Mar	10-Mar	0.65	0.33	0.31	6.29	0.63	13.18	0.00
Mar	11-Mar	0.65	0.33	0.31	6.29	0.63	10.86	0.00
Mar	12-Mar	0.65	0.33	0.31	6.29	0.63	8.53	0.00
Mar	13-Mar	0.65	0.33	0.31	6.29	0.63	6.21	0.00
Mar	14-Mar	0.65	0.33	0.31	6.29	0.63	3.88	0.00
Mar	15-Mar	0.65	0.33	0.31	6.29	0.63	1.56	0.00
Mar	16-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	17-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	18-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	19-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	20-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	21-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	22-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	23-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	24-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	25-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	26-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	27-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	28-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	29-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	30-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Mar	31-Mar	0.65	0.33	0.31	6.29	0.63	0.00	0.00
Apr	1-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	2-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	3-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	4-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	5-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	6-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	7-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	8-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	9-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	10-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	11-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	12-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	13-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	14-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	15-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	16-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	17-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	18-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	19-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	20-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	21-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	22-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	23-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	24-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	25-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	26-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	27-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	28-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
Apr	29-Apr	1.50	0.75	0.71	3.80	1.46	0.00	0.00
May	30-Apr	3.08	1.54	1.45	2.29	2.99	1.91	0.00
May	1-May	3.08	1.54	1.45	2.29	2.99	3.82	0.00
May	2-May	3.08	1.54	1.45	2.29	2.99	5.74	0.00
May	3-May	3.08	1.54	1.45	2.29	2.99	7.65	0.00
May	4-May	3.08	1.54	1.45	2.29	2.99	9.56	0.00
May	5-May	3.08	1.54	1.45	2.29	2.99	11.47	0.00
May	6-May	3.08	1.54	1.45	2.29	2.99	13.38	0.00
May	7-May	3.08	1.54	1.45	2.29	2.99	15.29	0.00
May	8-May	3.08	1.54	1.45	2.29	2.99	17.21	0.00
May	9-May	3.08	1.54	1.45	2.29	2.99	19.12	0.00
May	10-May	3.08	1.54	1.45	2.29	2.99	21.03	0.00
May	11-May	3.08	1.54	1.45	2.29	2.99	22.94	0.00
May	12-May	3.08	1.54	1.45	2.29	2.99	24.85	0.00
May	13-May	3.08	1.54	1.45	2.29	2.99	26.76	0.00
May	14-May	3.08	1.54	1.45	2.29	2.99	28.68	0.00
May	15-May	3.08	1.54	1.45	2.29	2.99	30.59	0.00
May	16-May	3.08	1.54	1.45	2.29	2.99	32.50	0.00
May	17-May	3.08	1.54	1.45	2.29	2.99	34.41	0.00
May	18-May	3.08	1.54	1.45	2.29	2.99	36.32	0.00
May	19-May	3.08	1.54	1.45	2.29	2.99	38.24	0.00
May	20-May	3.08	1.54	1.45	2.29	2.99	40.15	0.00
May	21-May	3.08	1.54	1.45	2.29	2.99	42.06	0.00
May	22-May	3.08	1.54	1.45	2.29	2.99	43.97	0.00

May	23-May	3.08	1.54	1.45	2.29	2.99	45.88	0.00
May	24-May	3.08	1.54	1.45	2.29	2.99	47.79	0.00
May	25-May	3.08	1.54	1.45	2.29	2.99	49.71	0.00
May	26-May	3.08	1.54	1.45	2.29	2.99	51.62	0.00
May	27-May	3.08	1.54	1.45	2.29	2.99	53.53	0.00
May	28-May	3.08	1.54	1.45	2.29	2.99	55.44	0.00
May	29-May	3.08	1.54	1.45	2.29	2.99	57.35	0.00
May	30-May	3.08	1.54	1.45	2.29	2.99	59.26	0.00
May	31-May	3.08	1.54	1.45	2.29	2.99	61.18	0.00