



**LAKE STEVENS  
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March 12, 2021

Eleanor Ott, PSNGP Permit Writer  
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Water Quality Program  
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The Lake Stevens Sewer District (permit WA0020893) appreciates the opportunity to comment on the Puget Sound Nutrient General Permit Preliminary Draft (January 2021).

Lake Stevens Sewer District owns and operates a moderately sized, publicly owned domestic wastewater treatment plant within the General Permit Proposed Facility Coverage list. The customer base of this facility is also of moderate size. The rate base would be challenged to take on additional significant capital improvements. It is a goal of the District to keep the rates within the generally accepted 2% of median household income. The District hopes that the Department of Ecology advocates and assist in making loans and grants available to assist in meeting these new requirements that could be attainable for Districts of moderate size to meet the challenges of this general permit.

As a general principle, the District does agree that water quality is mission critical for the District. As evidence of that, the District invested in a new \$120 million treatment plant facility, accepted by Ecology in 2013, that was expected to meet permit requirements for 20-30 years. The District also recognizes and accepts that there is a general order to ever increasing stringency in regulatory elements imposed to maintain water quality; however, the District holds that these regulatory elements must be based on quality, vetted scientific data. The draft general permit contradicts itself in stating that action level thresholds ( $AL_0/AL_1$ ) that trigger further action are intended to “first establish a loading capacity for nutrients that will meet D.O. criteria in the marine waters of Puget Sound.” If the general permit is to be used to collect the necessary complete data, then such studies should be completed to establish long-term criteria to protect the receiving waters prior to imposing changes. These protections should stay in place for the expected life cycle of capital improvements needed to meet any new regulations.

It is important to the District that Ecology acknowledges that there are six large plants covered by this permit, contributing about 77% of the total publicly owned treatment works (POTW) nutrient loading to Puget Sound. These high budget dischargers should be required to run the pilot tests to demonstrate that whatever treatment is effective, can also be efficient. Consequently, smaller budgeted dischargers would not be unduly burdened financially with unproven or highly expensive, treatment processes.

The District is also generally concerned with the speed at which the General Nutrient Permit will be implemented. The demand for testing equipment, laboratory accreditation, engineering support, and any additional operator training will bring undue pressure on the District. For example, the District’s laboratory is not currently accredited to test Total Organic Carbon, TKN, or Nitrate plus Nitrite Nitrogen in

Lake Stevens Sewer District  
Puget Sound Nutrient General Permit Comments

final effluent. In addition, we have not historically been testing total Ammonia, Nitrate plus Nitrite Nitrogen, or TKN in the influent. Some flexibility with testing methods would be appreciated.

In addition, the District’s engineers prepared a Technical Memorandum (attached to this letter) in which the action levels set for the District are challenged in both method of calculation and resulting limits. Based on this assessment the District would request reevaluation of Ecology’s specific limits, increasing AL<sub>0</sub> from 122,000 lbs/year to between 134,000 and 145,000 lbs/year of TIN.

The District’s comments to Ecology’s specific requested feedback follow:

1. *Do reviewers have feedback on whether the 95% UCL or 99% UCL is more appropriate for AL<sub>0</sub>?*

In the District’s opinion, the 95% upper bound confidence interval should be used. The bootstrap with a mean-unbiased estimator population parameter builds from the supplied data, assuming a normal distribution of data points. However, the number of requisite data point will be limited, as few as 52 point per year, based on our monitoring schedule, which can adversely affect the model if a series of data points are outside the appropriate mean of the distribution set, or an asymmetrical bias may occur. Furthermore, the upper bound of the confidence interval is more critical than the lower bound due to the intention of evaluating data that may exceed the action level and not data that is less than the action level. In other words, the upper 2.5% if using a 95% UCL, is most important. Since the bootstrapping method is already more heavily based on theoretical samplings than actual sampling and is a very conservative method of statistical sampling, the 95% UCL more than compensates for the sampling variation to achieve the desired goal.

2. *Do reviewers agree with this approach proposed for plants that have existing nitrogen-related effluent limits in their individual permits?*

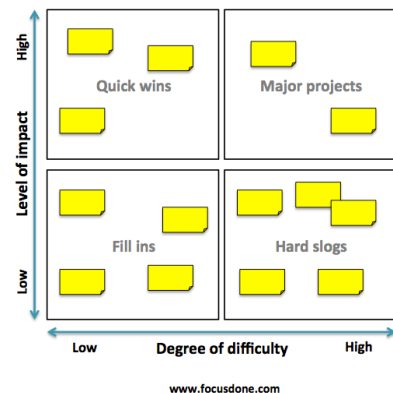
Yes, for consistency of implementation of the general nutrient permit the District accepts TIN action levels can be applied in addition to specific water quality-based nitrogen limits.

3. *Do reviewers agree with the approach proposed for calculating AL<sub>1</sub> for facilities that have historically been able to maintain their annual average TIN effluent concentration below 10 mg/L?*

No, since the AL<sub>0</sub> is to be established at 10 mg/L even facilities that have historically been below may go above during the permit cycle and should be held to the same standard of tier one actions when that occurs. Exempting these facilities from requirements beyond monitoring and optimization is a negligible reward to those facilities but a greater risk to the overall permit’s goals.

4. *Do reviewers have suggestions on what information permittees use to justify their decision-making process when conducting financial and technical analyses to select (or estimate) optimization strategies?*

The District generally approaches financial and technical improvements based on their implementation difficulty and expected effectiveness (see right for a typical Lean Sigma Six priority matrix). The District also evaluates any return on investment (ROI), public impact, and regulatory need on such capital investments.



Lake Stevens Sewer District  
Puget Sound Nutrient General Permit Comments

5. *Do reviewers have suggestions for “reasonable investments” at small (<3 MGD), medium (3-10 MGD) and large (>10 MGD) that could be used to separate the two tiers of optimization actions required by this permit?*

The reasonableness of the investment will depend on the skill of the operators and then on the local economical vibrancy. Reasonable investments should be reasonable, within the WWTP’s budget.

6. *Are there any additional Tier 1 optimization actions that should be included in this document?*  
7. *Are there any additional Tier 2 optimization actions that should be included in this document?*  
8. *Are the tiers broken out appropriately?*

No comment.

9. *Ecology is soliciting input on what types of Tier 3 actions plants must take to achieve further nutrient reduction, sooner, if they exceed their second action level trigger. Should these actions vary by facility size?*

Yes, but only assuming Tier 3 actions will be more effective than Tier 1 or 2. Controlling the most egregious polluters will translate to most important environmental protections at that specific point source. Larger facilities also generally lead to a larger customer base and/or debt capacity to support such capital expenses.

10. *Do reviewers have feedback on Ecology’s proposed use of a standardized form for the annual optimization report?*

A standardized form for the optimization report would be ideal. What is still unclear to the District is the level of detail expected and significance of optimization strategy attempted to be included on the report. The District’s operators make minor adjustments daily based on the needs of the plant and their skill level. It would be unreasonable to document all small changes.

11. *Do reviewers have examples of information from an existing, unrelated planning process that could meaningfully apply to meet this nutrient reduction evaluation requirement?*

The District had previously worked closely with Ecology on a study at upstream and downstream of our outfall via grab samples to evaluate TIN. This type of information based on the scientific method can provide valuable information but not be based on an engineer’s report or include an engineer’s seal. The engineering cost can be a limiting factor to attempt remove nutrients. The District is also concerned with a limited resource that costs will go up based on demand increase.

12. *Aside from treatment solutions, do reviewers have feedback on types of questions a regional study could answer? How could a regional study like this be used to develop and/or support a nutrient trading framework?*

The general permit framework as written treats all plants as equal contributors to the DO impact in Puget Sound. However, a regional study broken down by smaller tributaries could, along with DO studies in those waterways, lead to a more thorough understanding of the effects of the individual point sources. For instance, the District’s outfall into Ebey Slough (Snohomish River) could be compared to data from DOE’s rivers and streams biological monitoring data to get a more complete picture of smaller mixing zones and the contributing point sources within the larger Salish Sea model. The goals of this would be to determine the most detrimental point-sources in the overall model and direct regulatory controls and funding for improvements to those projects.

Lake Stevens Sewer District  
Puget Sound Nutrient General Permit Comments

*13. Do reviewers prefer one approach to a regional study over the other Ecology is soliciting specific feedback on how to develop permit requirements for a regional study that advances understanding of treatment upgrades by building on existing bodies of knowledge related to nutrient treatment processes.*

Again, the District is compelled to reiterate that using permit requirements with penalties is contradictory to monitoring and collecting data for a study. Perhaps a better way is to create an incentive like the Washington Energy Consortium (WEC) and have a Nutrient Reduction Forum.

*14. Do reviewers have feedback on whether a regional study should be limited to WWTPs <10 MGD so that larger facilities can conduct their own evaluation? Or, should Ecology provide minimum elements that must be satisfied leaving participation up to each discharger?*

The District believes Ecology should be the driver on study design and data processing for consistency. The information can then be properly evaluated and published in a more complete report. The District has found instances in the past of a lack of information sharing particularly from the larger WWTPs. There could very well be things smaller plants could learn and apply, having consistent collection of such data would be easier to that end.

*15. Do reviewers have feedback on the proposed timeframes for this evaluation?*

In general, the District operates on a 10-year window for future capital improvement projects (CIP) and within the framework of the Growth Management Act Comprehensive Plan. Because of this mindset it is easier to plan with longer notice periods and very difficult with shorter periods. Thus, starting the Regional Collaboration for Technology Exploration discussions and planning in year 3 would allow us more time for needed planning and future implementation.

*16. Is there interest in folding this type of treatment technology information sharing into an existing stakeholder process?*

As stated, The District has found instances in the past of a lack of information sharing particularly from the larger WWTPs. In addition, stakeholder committees and advisory committees are often limited to only a small percentage of the overall committee comprised of individuals with current WWTP experience or vested interest in what we feel is often the dissenting opinion.

*17. Do reviewers have suggestions or ideas for other Tier 3 actions that Ecology should consider? Should plants be able to identify different Tier 3 actions during the permit term provided Ecology pre-approval?*

No comment to the first question. Yes, additional flexibility may be warranted during the permit term for solutions that may not be identified yet.

Overall, it is the District's desire that Ecology please consider that costs of treating wastewater have and are expected to increase in years to come. WWTP point-sources are easy targets for regulation, but at what cost? Each increase in maintenance and operations and capital improvements comes with corresponding pressure applied on ratepayers, especially the underprivileged. These increases need to be carefully weighed so that our receiving waters are healthy and our costs are appropriate.

Thank you for this opportunity to comment on the Puget Sound Nutrient General Permit Preliminary Draft.

Lake Stevens Sewer District  
Puget Sound Nutrient General Permit Comments

Sincerely,

*Mariah Low*

Mariah Low  
Interim General Manager  
Lake Stevens Sewer District

Attached: Gray & Osborne, Inc. Technical Memorandum

## TECHNICAL MEMORANDUM

TO: MARIAH LOW, GENERAL MANAGER  
JOHNATHAN DIX, ASSISTANT GENERAL  
MANAGER  
JAMES HEITZMAN, WASTEWATER  
TREATMENT PLANT SUPERVISOR  
JEFF BAISCH, SENIOR WASTEWATER  
TREATMENT PLANT OPERATOR

FROM: JAY SWIFT, P.E.  
KOTA NISHIGUCHI, E.I.T.

DATE: MARCH 12, 2021

SUBJECT: TOTAL INORGANIC NITROGEN ACTION  
LEVEL EVALUATION, PRELIMINARY  
DRAFT PUGET SOUND NUTRIENT  
GENERAL PERMIT  
LAKE STEVENS SEWER DISTRICT,  
SNOHOMISH COUNTY, WASHINGTON  
G&O #20408.07

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The following memorandum notes findings from investigation into the total inorganic nitrogen (TIN) action level determination provided in the Preliminary Draft Puget Sound Nutrient General Permit (Draft Permit) dated January 2021. These analyses were done to assist with the evaluation of wastewater treatment capital and operating improvements in the Lake Stevens Sewer District General Sewer/Wastewater Facility Plan (Gray & Osborne, in progress), as well as to assist the District with the development of review comments to be submitted to the Washington State Department of Ecology (Ecology) regarding the Draft Permit.

### SUMMARY

The Draft Permit indicates that the calculated baseline action level ( $AL_0$ ) is meant to represent predicted 99<sup>th</sup> percentile plant effluent TIN loads based on historical observations. Calculation of  $AL_0$  assumes that if a facility behaves over the course of the permit cycle in a manner similar to its historical record, it can be assumed that “there is only a 1 percent chance of exceeding  $AL_0$  by chance in any year.” The second action level ( $AL_1$ ) is calculated as a 5 percent increase of  $AL_0$ .

District staff routinely analyze effluent ammonia and nitrate concentrations in house and record this data on their plant process data sheets, but do not submit this nitrate data on



Technical Memorandum – Total Inorganic Nitrogen Action Level Evaluation,  
Preliminary Draft Puget Sound Nutrient General Permit  
March 12, 2021

their discharge monitoring reports (DMRs). Effluent nitrate/nitrite concentrations are also analyzed once a month at the Everett Wastewater Treatment Plant (WWTP) laboratory and this is the data that is reported on the District's DMRs.

Calculations of annual effluent TIN load were separately determined using the more complete WWTP process data and show that annual loading has surpassed the proposed action levels for 3 of the past 4 years, as shown in Table 1. This would appear to conflict with the intent of the action level determination (1 percent chance of exceedance) as described in the Draft Permit.

**TABLE 1**

**Historical Effluent TIN Loads and Proposed Action Levels**

<b>Year</b>	<b>Annual Effluent TIN Load (lb/yr)<sup>(1)</sup></b>
2017	136,891
2018	115,320
2019	129,513
2020 <sup>(2)</sup>	132,960
<b>Draft Permit Proposed Action Limit</b>	<b>Annual Effluent TIN Load (lb/yr)</b>
AL <sub>0</sub>	122,000
AL <sub>1</sub>	128,100

- (1) Annual averages of TIN loadings calculated from process data (507 data points) are summarized in Table 1. Annual averages for TIN loadings calculated from DMR data (109 data points) ranged from 106,500 to 129,100 lb/yr.
- (2) December 2020 represented by one datum for nitrate, available from DMR.

Based on a review of the data and calculations, data input assumptions appear to have perhaps not fully represented the historical distribution of loadings, which resulted in a lower proposed action level than appropriate. Two alternative approaches to data input, which rely on actual measurements and minimize assumptions in the data input, are shown herein and resulted in a higher range of action levels (AL<sub>0</sub> between 134,000 and 145,000 pounds per year [lb/yr]).



Technical Memorandum – Total Inorganic Nitrogen Action Level Evaluation,  
Preliminary Draft Puget Sound Nutrient General Permit  
March 12, 2021

## **DATA INPUT AND CALCULATION FOR DRAFT PERMIT PROPOSED ACTION LEVEL**

The data used to calculate the  $AL_0$  in the Draft Permit uses data available through DMRs ranging from January 2016 to November 2020. The action level calculator shared by Ecology requires inputs of daily effluent TIN load and the associated date. In general, all other data provided in the input file appears to be unused and is organized in the calculator to provide additional context.

### **Apparent Assumptions Made for Draft Permit Calculation**

The data input file used for the Draft Permit action level calculation shows that input loads were calculated with *daily* flows and *daily* effluent ammonia concentrations; however, these were used in conjunction with *monthly* reported effluent nitrate (single-day composite measurement per month reported via DMR) illustrated as follows:

$$\begin{aligned} \text{Daily TIN Load} &= \text{Daily TIN Concentration} * \text{Daily Flow} * 8.34 \\ &= (\text{Daily Ammonia Concentration} + \text{Monthly Reported Nitrate}) * \text{Daily Flow} * 8.34 \end{aligned}$$

With concentrations noted in milligrams per liter (mg/L) and flows in million gallons per day (MGD).

This approach to providing daily TIN load inputs implies an assumption that daily variations in flow and ammonia concentrations have greater impact on effluent TIN than variations in effluent nitrate. In the Draft Permit calculation, each monthly reported effluent nitrate concentration is used as an average representative value for the entire month. This assumption appears to have perhaps not fully represented the historical distribution of loadings. Based on plant data, it is rare for effluent ammonia concentrations to be greater than effluent nitrate concentrations. Additionally, nitrate concentrations are typically an order of magnitude greater than ammonia concentrations; starting from 2017, the average ammonia concentration was 1.22 mg/L while nitrate was 14.5 mg/L, meaning that effluent TIN is primarily comprised of nitrate. Consequently, variations in effluent nitrate loadings tend to be primarily responsible for variations in effluent TIN. The Draft Permit's calculation does not accurately reflect that daily variations in nitrate values have significant impact on daily TIN loads. (Note: Nitrite concentrations measured in Lake Stevens effluent have been less than 0.1 percent of nitrate concentrations, so nitrate concentrations are assumed to equal nitrate plus nitrite in this data.)

The above approach to estimating daily TIN load provides a set of data inputs that maximizes the use of available ammonia measurements despite the fact that effluent TIN is comprised primarily of nitrate, for which fewer data points are available in the DMR





Technical Memorandum – Total Inorganic Nitrogen Action Level Evaluation,  
Preliminary Draft Puget Sound Nutrient General Permit  
March 12, 2021

data set. The apparent assumption is that a larger data set with approximated TIN values is more representative than a smaller data set, consisting of more accurate representations of the distribution of historical TIN loadings. Bootstrapping used to determine  $AL_0$  randomly resamples data points from the data input to create multiple simulated data sets, all consisting of a variety of combinations of data points from the original data input. Individual data points from the original data input are being used multiple times to holistically represent the data and create simulated observations. Because of the resampling of data used in bootstrapping, the benefit of bootstrapping is dependent on the accuracy of the original data input, not only the mean values but also the variability in the data. The Draft Permit data input had introduced approximated values, whose inaccuracies likely propagated through the simulated observations, and reduced variability and narrowed confidence intervals.

### **Alternative Approaches to Data Input**

Two alternative approaches are presented to data input: (1) maximize the use of plant process data, and (2) refine usage of DMR data.

#### Alternative 1 – Maximize Use of Plant Process Data

Based on a review of available data (DMRs and plant process data), the following changes were applied as an alternative approach to data input:

- Whenever available in plant process data, flow, ammonia, and nitrate concentrations measured for the same date were used to calculate daily effluent TIN loads.
- DMR nitrate data were only used when the lack of plant process data would result in missing a month of TIN load. The DMR nitrate data points were used in conjunction with the flow and ammonia concentration of the date for which nitrate was reported; this limits the quantity of approximated TIN loads in the data input. Notably, much of the input data for 2016 consists of this approach due to the limited nitrate data in 2016.
- Lastly, as a note, the Draft Permit calculation for  $AL_0$  included data input for November 2016 for which the reported nitrate concentration was 1.3 mg/L; plant process data shows that nitrate ranged from 12.6 to 21.3 mg/L during this period. This misinput of data likely had some influence on the Draft Permit  $AL_0$  determinations. As discussed above, November 2016 inputs have been replaced with TIN loads calculated with available plant process data.



Technical Memorandum – Total Inorganic Nitrogen Action Level Evaluation,  
Preliminary Draft Puget Sound Nutrient General Permit  
March 12, 2021

Due to the inclusion of plant process data, the data input described above consists of 597 data points, compared to 476 data points used for the Draft Permit action level determination. For this alternative approach for data input, a large majority of data points consist of TIN loads calculated from plant process data that accurately represent flow, ammonia, and nitrate. Therefore, this alternative approach is believed to increase the quantity and quality of input data.

As shown on Figure 1, with these revised assumptions, Ecology’s Action Level Calculator returns an  $AL_0$  of 145,000 lb/yr. In turn, the  $AL_1$  would be 152,250 lb/yr. Based on Figure 1, the action level appears plausible according to Ecology’s intent (1 percent exceedance chance) for the action level; unlike the Draft Permit’s proposed  $AL_0$ , the alternative  $AL_0$  has not been exceeded by the WWTP multiple times in recent history.

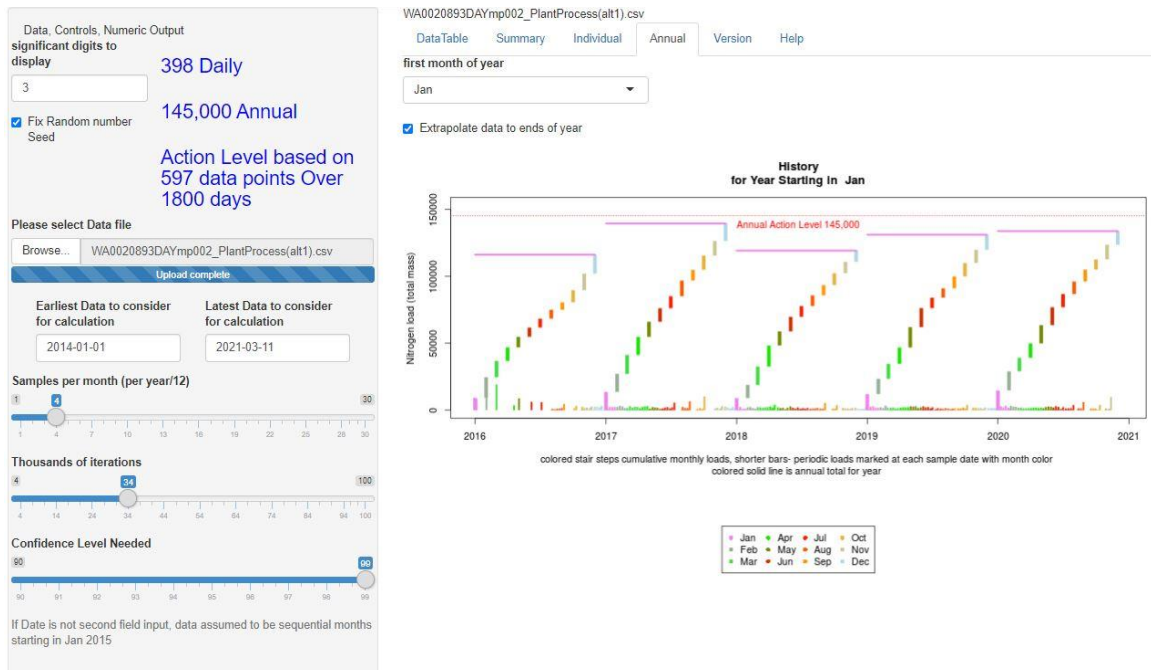


FIGURE 1

Revised Action Level ( $AL_0$ ) Calculation, Alternative 1 – Screen Capture



Technical Memorandum – Total Inorganic Nitrogen Action Level Evaluation,  
Preliminary Draft Puget Sound Nutrient General Permit  
March 12, 2021

Alternative 2 – Refine Usage of DMR Data

Another approach to data input consists of continuing the use of reported nitrate data but removing the data points that approximate TIN concentration based on assumptions of constant nitrate levels throughout the month. In turn, data used in the original Draft Permit calculation would be used without the assumptions that are believed to have perhaps misrepresented the historical distribution of TIN loadings. The following changes were applied to the original data input:

- Whenever available in DMR data, flow, ammonia, and nitrate concentrations measured for the same date were used to calculate daily effluent TIN loads.
- For any month of DMR data that did not allow for a calculation of daily effluent TIN (e.g., no ammonia measurement for corresponding nitrate measurement), plant process data was used to represent TIN loads for the month. Here, the use of plant process data followed its use for the first alternative approach. This method was applicable for data for August 2016 and August 2018.
- For the previously discussed reasons, November 2016 inputs have been replaced with TIN loads calculated with available plant process data.

The TIN action level calculation resulting from the revisions above is shown on Figure 2. The calculator returns an  $AL_0$  of 134,000 lb/yr. Based on this value, the  $AL_1$  would be 140,700 lb/yr.



Technical Memorandum – Total Inorganic Nitrogen Action Level Evaluation,  
Preliminary Draft Puget Sound Nutrient General Permit  
March 12, 2021

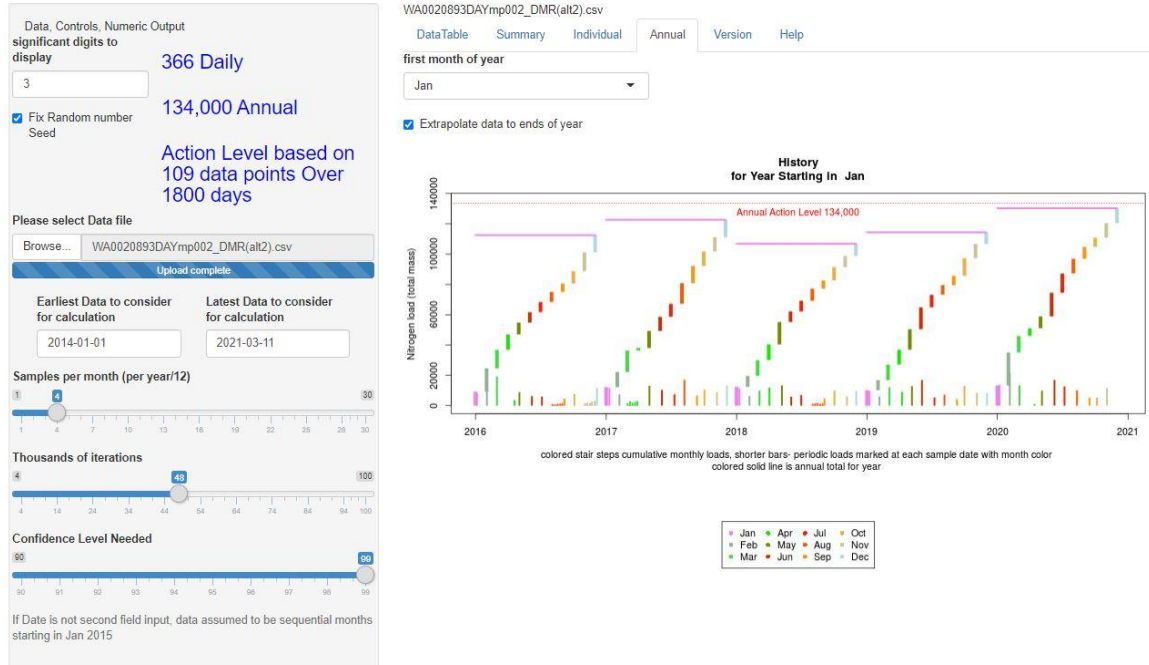


FIGURE 2

**Revised Action Level (AL<sub>0</sub>) Calculation, Alternative 2 – Screen Capture**

Notably, the historical TIN loads calculated from plant process data, shown in Table 1, suggest that the AL<sub>0</sub> of 134,000 lb/yr has been surpassed at least once in recent history. Conversely, the historical TIN loads calculated from DMR data, shown on Figure 2, suggest that the AL<sub>0</sub> has not been exceeded since 2016. Therefore, there is a discrepancy between historical observations made from plant process data and DMR data. However, this discrepancy derived from the different data sets is considered slight. Either data set can be used to calculate a revised AL<sub>0</sub> that better represents the historical distribution of TIN loadings observations than the AL<sub>0</sub> proposed in the Draft Permit. However, Alternative 1, with five times the data points, provides a larger, more robust data set for the action limit calculation.

**ATTACHMENT A**  
**DRAFT PERMIT ACTION LEVEL**

# TIN AL<sub>0</sub> Calculator

## Intro

The action level is displayed on the left side once the data is loaded. Action level is recalculated as controls are adjusted  
On the right side, you can find a plot of monthly loads and annual loads compared to the action level  
File must be space or tab delimited text with column for load first, and ...  
if desired second column with date in 'YYYY-MM-DD' or 'MM/DD/YYYY' format, will allow distinguishing data by month.  
See "Help" tab for more detailed instructions

Data, Controls, Numeric Output  
significant digits to display

335 Daily

Fix Random number Seed

122,000 Annual

Action Level based on 476 data points Over 1760 days

Please select Data file

Browse... WA0020893DAYmp002.csv

Upload complete

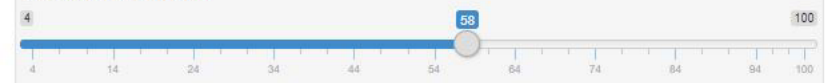
Earliest Data to consider for calculation

Latest Data to consider for calculation

Samples per month (per year/12)



Thousands of iterations



Confidence Level Needed



If Date is not second field input, data assumed to be sequential months starting in Jan 2015

Define a load to determine fraction of estimates that exceed the load

Defined average daily load

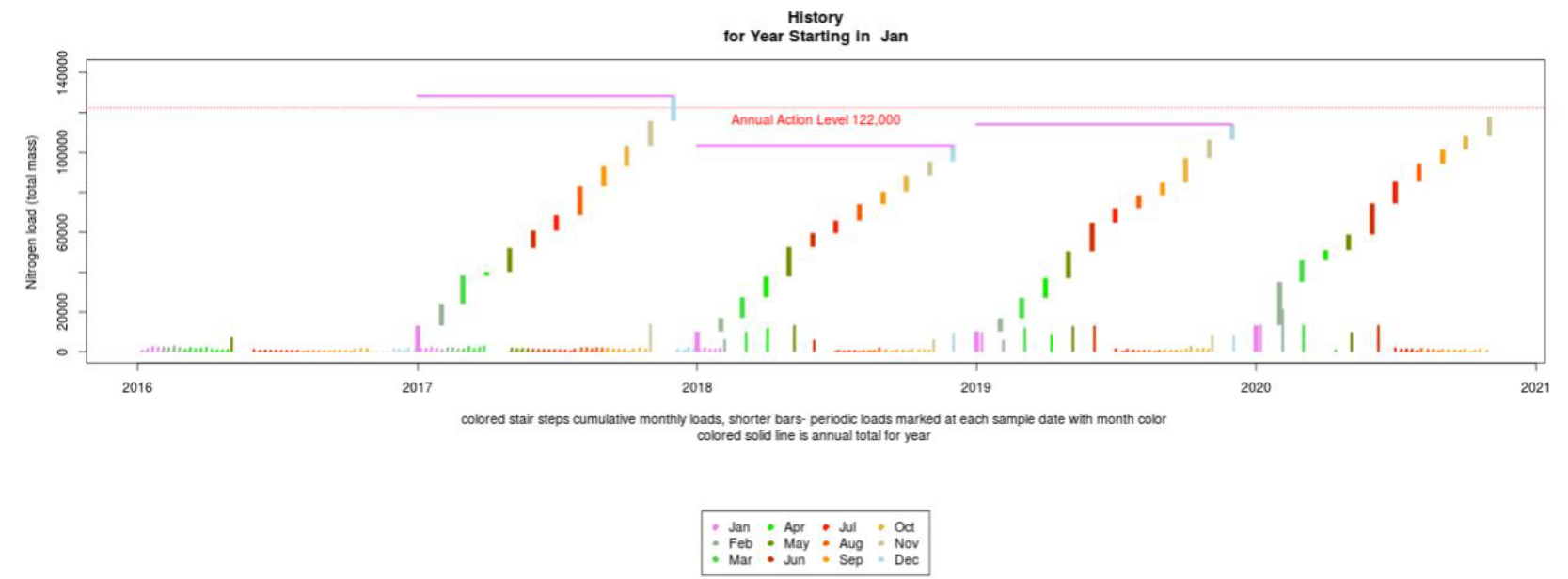
Fraction of estimates exceeding 335 = 1%

WA0020893DAYmp002.csv

DataTable Summary Individual Annual Version Help

first month of year

Extrapolate data to ends of year



load	POS	Q2	Qave	AMM	NIT	Ammonia	Nitrate...	Nitrite
297.7915	1/5/2016	2.511	3.12294	0.02	14.2	0.02		14.2
294.3219	1/6/2016	2.48	3.12294	0.03	14.2	0.03	NA	
285.1466	1/7/2016	2.401	3.12294	0.04	14.2	0.04	NA	
291.3959	1/11/2016	2.372	3.12294	0.53	14.2	0.53	NA	
375.6498	1/13/2016	3.141	3.12294	0.14	14.2	0.14	NA	
347.3376	1/14/2016	2.814	3.12294	0.6	14.2	0.6	NA	
367.5655	1/19/2016	3.082	3.12294	0.1	14.2	0.1	NA	
360.1724	1/20/2016	3.037	3.12294	0.02	14.2	0.02	NA	
577.6618	1/21/2016	4.81	3.12294	0.2	14.2	0.2	NA	
389.5839	1/26/2016	3.285	3.12294	0.02	14.2	0.02	NA	
403.9339	1/27/2016	3.406	3.12294	0.02	14.2	0.02	NA	
548.1452	1/28/2016	4.622	3.12294	0.02	14.2	0.02	NA	
540.1278	2/2/2016	2.848	2.97866	0.04	22.7	0.04		22.7
539.0345	2/3/2016	2.836	2.97866	0.09	22.7	0.09	NA	
529.5504	2/4/2016	2.791	2.97866	0.05	22.7	0.05	NA	
487.312	2/9/2016	2.565	2.97866	0.08	22.7	0.08	NA	
482.7524	2/10/2016	2.541	2.97866	0.08	22.7	0.08	NA	
492.0356	2/11/2016	2.591	2.97866	0.07	22.7	0.07	NA	
731.4113	2/16/2016	3.86	2.97866	0.02	22.7	0.02	NA	
725.3569	2/17/2016	3.823	2.97866	0.05	22.7	0.05	NA	
651.4532	2/18/2016	3.435	2.97866	0.04	22.7	0.04	NA	
511.0405	2/23/2016	2.697	2.97866	0.02	22.7	0.02	NA	
490.7656	2/24/2016	2.59	2.97866	0.02	22.7	0.02	NA	
482.2888	2/25/2016	2.533	2.97866	0.13	22.7	0.13	NA	
392.5671	3/1/2016	2.92	3.07742	0.02	16.1	0.02		16.1
379.6608	3/2/2016	2.824	3.07742	0.02	16.1	0.02	NA	
374.4148	3/3/2016	2.761	3.07742	0.16	16.1	0.16	NA	
446.8127	3/7/2016	3.303	3.07742	0.12	16.1	0.12	NA	
511.4128	3/9/2016	3.804	3.07742	0.02	16.1	0.02	NA	
493.7867	3/10/2016	3.648	3.07742	0.13	16.1	0.13	NA	
424.0865	3/15/2016	3.135	3.07742	0.12	16.1	0.12	NA	
398.7514	3/16/2016	2.966	3.07742	0.02	16.1	0.02	NA	
376.7031	3/17/2016	2.802	3.07742	0.02	16.1	0.02	NA	
362.1391	3/22/2016	2.692	3.07742	0.03	16.1	0.03	NA	
387.7273	3/23/2016	2.884	3.07742	0.02	16.1	0.02	NA	
443.9235	3/24/2016	3.302	3.07742	0.02	16.1	0.02	NA	
401.7091	3/29/2016	2.988	3.07742	0.02	16.1	0.02	NA	
377.0001	3/30/2016	2.799	3.07742	0.05	16.1	0.05	NA	
363.3935	3/31/2016	2.703	3.07742	0.02	16.1	0.02	NA	
281.6134	4/7/2016	2.492	2.43637	0.15	13.4	0.15	NA	
272.5111	4/12/2016	2.433	2.43637	0.03	13.4	0.03	NA	
264.1945	4/13/2016	2.35	2.43637	0.08	13.4	0.08	NA	
264.8093	4/14/2016	2.366	2.43637	0.02	13.4	0.02	NA	
256.8628	4/19/2016	2.295	2.43637	0.02	13.4	0.02		13.4

260.5563	4/20/2016	2.328	2.43637	0.02	13.4	0.02 NA	
245.7825	4/21/2016	2.196	2.43637	0.02	13.4	0.02 NA	
278.8954	4/26/2016	2.49	2.43637	0.03	13.4	0.03 NA	
269.8459	4/27/2016	2.411	2.43637	0.02	13.4	0.02 NA	
271.9724	4/28/2016	2.43	2.43637	0.02	13.4	0.02 NA	
252.4835	5/3/2016	2.29	2.22839	0.02	13.2	0.02	13.2
239.4848	6/1/2016	2.192	2.1628	0.4	12.7	0.4 NA	
224.8998	6/7/2016	2.12	2.1628	0.02	12.7	0.02	12.7
223.1259	6/8/2016	2.082	2.1628	0.15	12.7	0.15 NA	
216.2008	6/9/2016	2.038	2.1628	0.02	12.7	0.02 NA	
236.463	6/14/2016	2.229	2.1628	0.02	12.7	0.02 NA	
236.8874	6/15/2016	2.233	2.1628	0.02	12.7	0.02 NA	
227.658	6/16/2016	2.146	2.1628	0.02	12.7	0.02 NA	
229.1432	6/21/2016	2.16	2.1628	0.02	12.7	0.02 NA	
226.7032	6/22/2016	2.137	2.1628	0.02	12.7	0.02 NA	
222.7781	6/23/2016	2.1	2.1628	0.02	12.7	0.02 NA	
218.959	6/28/2016	2.064	2.1628	0.02	12.7	0.02 NA	
223.3085	6/29/2016	2.105	2.1628	0.02	12.7	0.02 NA	
216.9434	6/30/2016	2.045	2.1628	0.02	12.7	0.02 NA	
214.6773	7/5/2016	2.254	2.09394	0.02	11.4	0.02	11.4
203.8196	7/6/2016	2.14	2.09394	0.02	11.4	0.02 NA	
194.7715	7/7/2016	2.045	2.09394	0.02	11.4	0.02 NA	
195.0573	7/12/2016	2.048	2.09394	0.02	11.4	0.02 NA	
194.0096	7/13/2016	2.037	2.09394	0.02	11.4	0.02 NA	
189.5332	7/14/2016	1.99	2.09394	0.02	11.4	0.02 NA	
202.391	7/19/2016	2.125	2.09394	0.02	11.4	0.02 NA	
198.867	7/20/2016	2.088	2.09394	0.02	11.4	0.02 NA	
187.8188	7/21/2016	1.972	2.09394	0.02	11.4	0.02 NA	
187.3426	7/26/2016	1.967	2.09394	0.02	11.4	0.02 NA	
191.0571	7/27/2016	2.006	2.09394	0.02	11.4	0.02 NA	
200.2956	7/28/2016	2.103	2.09394	0.02	11.4	0.02 NA	
174.3754	8/2/2016	2.026	2.05555	0.02	10.3	0.02 NA	
179.1122	8/3/2016	2.073	2.05555	0.06	10.3	0.06 NA	
178.0763	8/4/2016	2.069	2.05555	0.02	10.3	0.02 NA	
176.0968	8/6/2016	2.046	2.05555	0.02	10.3 NA		10.3
185.4366	8/9/2016	2.078	2.05555	0.4	10.3	0.4 NA	
175.317	8/10/2016	2.033	2.05555	0.04	10.3	0.04 NA	
170.3302	8/11/2016	1.979	2.05555	0.02	10.3	0.02 NA	
183.1544	8/16/2016	2.128	2.05555	0.02	10.3	0.02 NA	
178.1444	8/17/2016	2.046	2.05555	0.14	10.3	0.14 NA	
178.708	8/18/2016	2.033	2.05555	0.24	10.3	0.24 NA	
174.8057	8/23/2016	2.031	2.05555	0.02	10.3	0.02 NA	
175.9228	8/24/2016	2.042	2.05555	0.03	10.3	0.03 NA	
169.5555	8/25/2016	1.97	2.05555	0.02	10.3	0.02 NA	
179.0231	8/30/2016	2.08	2.05555	0.02	10.3	0.02 NA	



176.9154	8/31/2016	2.028	2.05555	0.16	10.3	0.16 NA	
151.2089	9/1/2016	1.988	2.2469	0.08	9.04	0.08 NA	
166.9885	9/6/2016	2.21	2.2469	0.02	9.04	0.02 NA	9.04
180.2144	9/7/2016	2.359	2.2469	0.12	9.04	0.12 NA	
182.3363	9/8/2016	2.361	2.2469	0.22	9.04	0.22 NA	
180.5747	9/12/2016	2.356	2.2469	0.15	9.04	0.15 NA	
186.1528	9/13/2016	2.352	2.2469	0.45	9.04	0.45 NA	
183.5477	9/14/2016	2.283	2.2469	0.6	9.04	0.6 NA	
176.9937	9/19/2016	2.241	2.2469	0.43	9.04	0.43 NA	
167.686	9/20/2016	2.176	2.2469	0.2	9.04	0.2 NA	
166.7093	9/21/2016	2.154	2.2469	0.24	9.04	0.24 NA	
164.0828	9/27/2016	2.093	2.2469	0.36	9.04	0.36 NA	
175.3558	9/28/2016	2.308	2.2469	0.07	9.04	0.07 NA	
174.0944	9/29/2016	2.247	2.2469	0.25	9.04	0.25 NA	
274.7339	10/4/2016	2.401	2.80587	0.02	13.7	0.02 NA	13.7
275.8704	10/5/2016	2.378	2.80587	0.21	13.7	0.21 NA	
267.1325	10/6/2016	2.316	2.80587	0.13	13.7	0.13 NA	
298.7923	10/9/2016	2.598	2.80587	0.09	13.7	0.09 NA	
276.5647	10/10/2016	2.417	2.80587	0.02	13.7	0.02 NA	
248.6154	10/11/2016	2.168	2.80587	0.05	13.7	0.05 NA	
362.0962	10/17/2016	3.153	2.80587	0.07	13.7	0.07 NA	
342.5342	10/18/2016	2.987	2.80587	0.05	13.7	0.05 NA	
347.5598	10/19/2016	2.964	2.80587	0.36	13.7	0.36 NA	
303.6834	10/25/2016	2.654	2.80587	0.02	13.7	0.02 NA	
392.176	10/26/2016	3.335	2.80587	0.4	13.7	0.4 NA	
367.6469	10/27/2016	3.213	2.80587	0.02	13.7	0.02 NA	
39.71975	11/1/2016	3.608	3.4292	0.02	1.3	0.02 NA	
33.92912	11/3/2016	3.082	3.4292	0.02	1.3	0.02 NA	
32.66311	11/7/2016	2.967	3.4292	0.02	1.3	0.02 NA	
30.57144	11/8/2016	2.777	3.4292	0.02	1.3	0.02 NA	1.3
31.62828	11/9/2016	2.873	3.4292	0.02	1.3	0.02 NA	
47.74517	11/15/2016	4.337	3.4292	0.02	1.3	0.02 NA	
40.51238	11/16/2016	3.68	3.4292	0.02	1.3	0.02 NA	
36.2313	11/17/2016	3.242	3.4292	0.04	1.3	0.04 NA	
39.02069	11/20/2016	3.366	3.4292	0.09	1.3	0.09 NA	
34.24271	11/21/2016	3.019	3.4292	0.06	1.3	0.06 NA	
35.84999	11/22/2016	3.232	3.4292	0.03	1.3	0.03 NA	
42.33984	11/29/2016	3.846	3.4292	0.02	1.3	0.02 NA	
43.09945	11/30/2016	3.915	3.4292	0.02	1.3	0.02 NA	
378.5476	12/1/2016	3.745	3.18406	0.02	12.1	0.02 NA	
337.9131	12/6/2016	3.343	3.18406	0.02	12.1	0.02 NA	12.1
321.9718	12/7/2016	3.167	3.18406	0.09	12.1	0.09 NA	
310.5854	12/8/2016	3.055	3.18406	0.09	12.1	0.09 NA	
312.6429	12/13/2016	3.093	3.18406	0.02	12.1	0.02 NA	
299.4013	12/14/2016	2.962	3.18406	0.02	12.1	0.02 NA	

295.7751	12/15/2016	2.888	3.18406	0.18	12.1	0.18	NA
290.6073	12/19/2016	2.875	3.18406	0.02	12.1	0.02	NA
292.9602	12/20/2016	2.884	3.18406	0.08	12.1	0.08	NA
315.4434	12/27/2016	3.113	3.18406	0.05	12.1	0.05	NA
301.8422	12/28/2016	2.969	3.18406	0.09	12.1	0.09	NA
321.7886	12/29/2016	3.142	3.18406	0.18	12.1	0.18	NA
448.475	1/3/2017	2.913	2.83858	0.86	17.6	0.86	NA
411.1324	1/4/2017	2.793	2.83858	0.05	17.6	0.05	NA
402.2043	1/5/2017	2.737	2.83858	0.02	17.6	0.02	NA
417.5748	1/10/2017	2.742	2.83858	0.66	17.6	0.66	17.6
416.1667	1/11/2017	2.824	2.83858	0.07	17.6	0.07	NA
398.7138	1/12/2017	2.611	2.83858	0.71	17.6	0.71	NA
441.4402	1/17/2017	3.004	2.83858	0.02	17.6	0.02	NA
580.3159	1/18/2017	3.717	2.83858	1.12	17.6	1.12	NA
513.1494	1/19/2017	3.49	2.83858	0.03	17.6	0.03	NA
397.9531	1/24/2017	2.705	2.83858	0.04	17.6	0.04	NA
421.4529	1/25/2017	2.736	2.83858	0.87	17.6	0.87	NA
400.5879	1/26/2017	2.726	2.83858	0.02	17.6	0.02	NA
376.9509	1/31/2017	2.555	2.83858	0.09	17.6	0.09	NA
294.0252	2/1/2017	2.551	3.23468	0.02	13.8	0.02	NA
298.1821	2/2/2017	2.509	3.23468	0.45	13.8	0.45	NA
338.3998	2/7/2017	2.936	3.23468	0.02	13.8	0.02	13.8
375.5132	2/8/2017	3.258	3.23468	0.02	13.8	0.02	NA
468.7498	2/9/2017	3.989	3.23468	0.29	13.8	0.29	NA
374.3736	2/14/2017	3.062	3.23468	0.86	13.8	0.86	NA
477.6254	2/15/2017	4.129	3.23468	0.07	13.8	0.07	NA
468.0341	2/16/2017	4.02	3.23468	0.16	13.8	0.16	NA
383.2787	2/21/2017	3.311	3.23468	0.08	13.8	0.08	NA
376.2047	2/22/2017	3.264	3.23468	0.02	13.8	0.02	NA
355.1124	2/23/2017	3.081	3.23468	0.02	13.8	0.02	NA
375.3706	2/28/2017	3.087	3.23468	0.78	13.8	0.78	NA
473.7123	3/1/2017	3.092	3.55358	0.47	17.9	0.47	17.9
340.1004	3/2/2017	3.014	3.55358	0.03	13.5	0.03	13.5
480.41	3/7/2017	3.702	3.55358	0.46	15.1	0.46	15.1
530.6627	3/8/2017	3.498	3.55358	0.39	17.8	0.39	17.8
588.8736	3/9/2017	3.586	3.55358	0.19	19.5	0.19	19.5
348.3535	3/14/2017	3.825	3.55358	0.02	10.9	0.02	10.9
414.1466	3/15/2017	4.379	3.55358	0.04	11.3	0.04	11.3
387.1395	3/16/2017	3.83	3.55358	0.02	12.1	0.02	12.1
440.5084	3/21/2017	3.375	3.55358	0.15	15.5	0.15	15.5
469.8085	3/22/2017	3.188	3.55358	0.77	16.9	0.77	16.9
523.2519	3/23/2017	3.077	3.55358	0.49	19.9	0.49	19.9
286.2185	3/28/2017	3.358	3.55358	0.02	10.2	0.02	10.2
529.6879	3/29/2017	4.002	3.55358	0.17	15.7	0.17	15.7
1.299789	4/4/2017	3.117	3.26913	0.04	0.01	0.04	0.01

0.8129	4/5/2017	3.249	3.26913	0.02	0.01	0.02 NA	
0.786379	4/6/2017	3.143	3.26913	0.02	0.01	0.02 NA	
3.848076	4/11/2017	3.076	3.26913	0.14	0.01	0.14 NA	
0.941503	4/12/2017	3.763	3.26913	0.02	0.01	0.02 NA	
0.940001	4/13/2017	3.757	3.26913	0.02	0.01	0.02 NA	
0.715072	4/18/2017	2.858	3.26913	0.02	0.01	0.02 NA	
0.746847	4/19/2017	2.985	3.26913	0.02	0.01	0.02 NA	
10.30424	4/20/2017	3.861	3.26913	0.31	0.01	0.31 NA	
0.773118	4/25/2017	3.09	3.26913	0.02	0.01	0.02 NA	
0.844675	4/26/2017	3.376	3.26913	0.02	0.01	0.02 NA	
30.09147	4/27/2017	3.193	3.26913	1.12	0.01	1.12 NA	
375.9532	5/2/2017	2.828	2.92835	0.04	15.9	0.04	15.9
391.2814	5/3/2017	2.947	2.92835	0.02	15.9	0.02 NA	
439.6107	5/4/2017	3.311	2.92835	0.02	15.9	0.02 NA	
380.9252	5/9/2017	2.869	2.92835	0.02	15.9	0.02 NA	
411.4622	5/10/2017	2.8	2.92835	1.72	15.9	1.72 NA	
378.9995	5/11/2017	2.842	2.92835	0.09	15.9	0.09 NA	
481.5669	5/16/2017	3.627	2.92835	0.02	15.9	0.02 NA	
403.5077	5/18/2017	3.022	2.92835	0.11	15.9	0.11 NA	
387.0934	5/23/2017	2.844	2.92835	0.42	15.9	0.42 NA	
372.2919	5/24/2017	2.783	2.92835	0.14	15.9	0.14 NA	
377.4731	5/25/2017	2.843	2.92835	0.02	15.9	0.02 NA	
349.5276	5/30/2017	2.621	2.92835	0.09	15.9	0.09 NA	
343.3118	5/31/2017	2.576	2.92835	0.08	15.9	0.08 NA	
308.5566	6/1/2017	2.58	2.41167	0.04	14.3	0.04 NA	
296.5849	6/6/2017	2.473	2.41167	0.08	14.3	0.08	14.3
291.4396	6/7/2017	2.42	2.41167	0.14	14.3	0.14 NA	
301.6771	6/8/2017	2.526	2.41167	0.02	14.3	0.02 NA	
290.4508	6/13/2017	2.432	2.41167	0.02	14.3	0.02 NA	
305.26	6/14/2017	2.556	2.41167	0.02	14.3	0.02 NA	
289.376	6/15/2017	2.423	2.41167	0.02	14.3	0.02 NA	
280.9626	6/20/2017	2.346	2.41167	0.06	14.3	0.06 NA	
290.0343	6/21/2017	2.41	2.41167	0.13	14.3	0.13 NA	
275.1171	6/22/2017	2.302	2.41167	0.03	14.3	0.03 NA	
276.9554	6/27/2017	2.319	2.41167	0.02	14.3	0.02 NA	
275.2834	6/28/2017	2.305	2.41167	0.02	14.3	0.02 NA	
276.3582	6/29/2017	2.314	2.41167	0.02	14.3	0.02 NA	
252.5989	7/4/2017	2.298	2.21252	0.08	13.1	0.08 NA	
262.9352	7/5/2017	2.325	2.21252	0.46	13.1	0.46 NA	
257.5309	7/6/2017	2.35	2.21252	0.04	13.1	0.04 NA	
268.4092	7/11/2017	2.453	2.21252	0.02	13.1	0.02	13.1
239.5221	7/12/2017	2.189	2.21252	0.02	13.1	0.02 NA	
241.4917	7/13/2017	2.207	2.21252	0.02	13.1	0.02 NA	
242.0043	7/18/2017	2.21	2.21252	0.03	13.1	0.03 NA	
252.8781	7/19/2017	2.172	2.21252	0.86	13.1	0.86 NA	

228.5801	7/20/2017	2.089	2.21252	0.02	13.1	0.02 NA	
251.3819	7/23/2017	2.268	2.21252	0.19	13.1	0.19 NA	
264.7983	7/24/2017	2.42	2.21252	0.02	13.1	0.02 NA	
232.3417	7/25/2017	2.032	2.21252	0.61	13.1	0.61 NA	
466.1551	8/1/2017	2.11	2.08839	0.19	26.3	0.19 NA	
459.8192	8/2/2017	2.09	2.08839	0.08	26.3	0.08 NA	
470.2826	8/3/2017	2.08	2.08839	0.81	26.3	0.81 NA	
488.1502	8/8/2017	2.08	2.08839	1.84	26.3	1.84	26.3
454.2631	8/9/2017	2.04	2.08839	0.4	26.3	0.4 NA	
489.5046	8/10/2017	2.23	2.08839	0.02	26.3	0.02 NA	
481.6267	8/15/2017	2.15	2.08839	0.56	26.3	0.56 NA	
456.5783	8/16/2017	2.08	2.08839	0.02	26.3	0.02 NA	
467.1401	8/17/2017	2.09	2.08839	0.5	26.3	0.5 NA	
456.5783	8/21/2017	2.08	2.08839	0.02	26.3	0.02 NA	
463.1636	8/22/2017	2.11	2.08839	0.02	26.3	0.02 NA	
468.2668	8/23/2017	2.11	2.08839	0.31	26.3	0.31 NA	
470.4627	8/28/2017	2.14	2.08839	0.06	26.3	0.06 NA	
459.5757	8/29/2017	2.06	2.08839	0.45	26.3	0.45 NA	
452.7035	8/30/2017	2.06	2.08839	0.05	26.3	0.05 NA	
353.6282	9/4/2017	2.253	2.09257	0.42	18.4	0.42 NA	
331.3906	9/5/2017	2.156	2.09257	0.03	18.4	0.03 NA	
324.4507	9/6/2017	2.104	2.09257	0.09	18.4	0.09 NA	
317.5288	9/12/2017	2.058	2.09257	0.1	18.4	0.1	18.4
331.9789	9/13/2017	2.161	2.09257	0.02	18.4	0.02 NA	
310.0108	9/14/2017	2.018	2.09257	0.02	18.4	0.02 NA	
330.1354	9/19/2017	2.149	2.09257	0.02	18.4	0.02 NA	
316.9238	9/20/2017	2.063	2.09257	0.02	18.4	0.02 NA	
319.4974	9/21/2017	2.073	2.09257	0.08	18.4	0.08 NA	
316.6166	9/26/2017	2.061	2.09257	0.02	18.4	0.02 NA	
316.463	9/27/2017	2.06	2.09257	0.02	18.4	0.02 NA	
309.0891	9/28/2017	2.012	2.09257	0.02	18.4	0.02 NA	
303.6978	10/3/2017	2.055	2.291	0.02	17.7	0.02	17.7
301.6288	10/4/2017	2.041	2.291	0.02	17.7	0.02 NA	
302.9687	10/5/2017	2.042	2.291	0.09	17.7	0.09 NA	
293.3528	10/6/2017	1.985	2.291	0.02	17.7	0.02 NA	
340.2006	10/8/2017	2.302	2.291	0.02	17.7	0.02 NA	
315.6683	10/9/2017	2.136	2.291	0.02	17.7	0.02 NA	
307.7393	10/10/2017	2.08	2.291	0.04	17.7	0.04 NA	
313.3615	10/16/2017	2.118	2.291	0.04	17.7	0.04 NA	
319.7234	10/17/2017	2.161	2.291	0.04	17.7	0.04 NA	
392.0034	10/18/2017	2.62	2.291	0.24	17.7	0.24 NA	
354.8399	10/24/2017	2.397	2.291	0.05	17.7	0.05 NA	
347.8854	10/25/2017	2.354	2.291	0.02	17.7	0.02 NA	
332.9592	10/26/2017	2.253	2.291	0.02	17.7	0.02 NA	
320.1019	10/31/2017	2.166	2.291	0.02	17.7	0.02 NA	

414.4188	11/1/2017	3.165	NA	0.1	15.6	NA	NA
380.3749	12/5/2017	2.905	3.134	0.1	15.6	0.1	15.6
383.3993	12/6/2017	2.798	3.134	0.83	15.6	0.83	NA
356.3782	12/7/2017	2.72	3.134	0.11	15.6	0.11	NA
326.8124	12/12/2017	2.477	3.134	0.22	15.6	0.22	NA
344.3556	12/13/2017	2.468	3.134	1.13	15.6	1.13	NA
321.5851	12/14/2017	2.416	3.134	0.36	15.6	0.36	NA
508.4054	12/17/2017	3.756	3.134	0.63	15.6	0.63	NA
536.4228	12/20/2017	4.076	3.134	0.18	15.6	0.18	NA
491.8405	12/21/2017	3.502	3.134	1.24	15.6	1.24	NA
382.824	12/26/2017	2.844	3.134	0.54	15.6	0.54	NA
361.6736	12/27/2017	2.707	3.134	0.42	15.6	0.42	NA
371.6628	12/28/2017	2.714	3.134	0.82	15.6	0.82	NA
270.9926	1/2/2018	3.077	3.624	0.16	10.4	0.16	NA
242.8064	1/3/2018	2.794	3.624	0.02	10.4	0.02	NA
246.8073	1/4/2018	2.73	3.624	0.44	10.4	0.44	NA
405.1618	1/9/2018	4.357	3.624	0.75	10.4	0.75	10.4
358.7835	1/10/2018	4.047	3.624	0.23	10.4	0.23	NA
442.9448	1/11/2018	4.959	3.624	0.31	10.4	0.31	NA
286.5185	1/16/2018	3.297	3.624	0.02	10.4	0.02	NA
297.8159	1/17/2018	3.427	3.624	0.02	10.4	0.02	NA
320.3237	1/18/2018	3.686	3.624	0.02	10.4	0.02	NA
318.4119	1/23/2018	3.664	3.624	0.02	10.4	0.02	NA
332.9246	1/24/2018	3.831	3.624	0.02	10.4	0.02	NA
306.2455	1/25/2018	3.524	3.624	0.02	10.4	0.02	NA
380.1998	1/30/2018	4.375	3.624	0.02	10.4	0.02	NA
317.369	1/31/2018	3.652	3.624	0.02	10.4	0.02	NA
228.4586	2/6/2018	4.476	3.74	0.02	6.1	0.02	6.1
358.1108	3/6/2018	2.838	3.08394	1.43	13.7	1.43	13.7
343.4712	4/3/2018	2.98	3.5245	0.12	13.7	0.12	13.7
515.0542	5/8/2018	2.67	2.55	0.13	23	0.13	23
212.474	6/3/2018	2.51	2.47	0.05	10.1	0.05	10.1
226.1618	7/1/2018	2.532	2.2261	0.41	10.3	0.41	10.3
292.3565	7/4/2018	2.359	2.2261	4.56	10.3	4.56	NA
209.4534	7/5/2018	2.376	2.2261	0.27	10.3	0.27	NA
293.7263	7/10/2018	2.162	2.2261	5.99	10.3	5.99	NA
200.3164	7/11/2018	2.135	2.2261	0.95	10.3	0.95	NA
190.9927	7/12/2018	2.202	2.2261	0.1	10.3	0.1	NA
193.5107	7/16/2018	2.214	2.2261	0.18	10.3	0.18	NA
221.226	7/18/2018	2.185	2.2261	1.84	10.3	1.84	NA
187.5839	7/19/2018	2.106	2.2261	0.38	10.3	0.38	NA
186.8806	7/24/2018	2.165	2.2261	0.05	10.3	0.05	NA
183.7967	7/25/2018	2.117	2.2261	0.11	10.3	0.11	NA
187.9336	7/26/2018	2.173	2.2261	0.07	10.3	0.07	NA
187.1017	7/31/2018	2.153	2.2261	0.12	10.3	0.12	NA

234.5099	8/3/2018	2.063	2.15	1.53	12.1	1.53 NA	
240.1578	8/4/2018	2.17	2.15	1.17	12.1	1.17 NA	
256.7746	8/5/2018	2.284	2.15	1.38	12.1	1.38 NA	
238.0621	8/6/2018	2.174	2.15	1.03	12.1	1.03 NA	
236.0911	8/7/2018	2.156	2.15	1.03	12.1 NA		12.1
260.0018	8/11/2018	2.264	2.15	1.67	12.1	1.67 NA	
264.5168	8/12/2018	2.374	2.15	1.26	12.1	1.26 NA	
277.3257	8/13/2018	2.208	2.15	2.96	12.1	2.96 NA	
268.5855	8/16/2018	2.221	2.15	2.4	12.1	2.4 NA	
264.9158	8/19/2018	2.256	2.15	1.98	12.1	1.98 NA	
261.5691	8/21/2018	2.178	2.15	2.3	12.1	2.3 NA	
264.6155	8/25/2018	2.128	2.15	2.81	12.1	2.81 NA	
292.3872	8/26/2018	2.278	2.15	3.29	12.1	3.29 NA	
328.4866	8/27/2018	2.104	2.15	6.62	12.1	6.62 NA	
197.3778	9/3/2018	2.28	2.37	1.35	9.03	1.35 NA	
171.2169	9/4/2018	2.184	2.37	0.37	9.03	0.37	9.03
217.6592	9/5/2018	2.103	2.37	3.38	9.03	3.38 NA	
175.6677	9/11/2018	2.287	2.37	0.18	9.03	0.18 NA	
173.0984	9/12/2018	2.256	2.37	0.17	9.03	0.17 NA	
184.3303	9/13/2018	2.405	2.37	0.16	9.03	0.16 NA	
187.8719	9/17/2018	2.399	2.37	0.36	9.03	0.36 NA	
179.1682	9/18/2018	2.31	2.37	0.27	9.03	0.27 NA	
180.0524	9/19/2018	2.263	2.37	0.51	9.03	0.51 NA	
202.1968	9/25/2018	2.422	2.37	0.98	9.03	0.98 NA	
212.7697	9/26/2018	2.371	2.37	1.73	9.03	1.73 NA	
243.4684	9/27/2018	2.237	2.37	4.02	9.03	4.02 NA	
284.6178	10/2/2018	2.564	2.46	4.66	8.65	4.66	8.65
336.115	10/3/2018	2.522	2.46	7.33	8.65	7.33 NA	
346.9573	10/4/2018	2.43	2.46	8.47	8.65	8.47 NA	
270.1761	10/7/2018	2.651	2.46	3.57	8.65	3.57 NA	
261.6732	10/8/2018	2.668	2.46	3.11	8.65	3.11 NA	
220.394	10/9/2018	2.479	2.46	2.01	8.65	2.01 NA	
225.0046	10/16/2018	2.181	2.46	3.72	8.65	3.72 NA	
253.9226	10/17/2018	2.242	2.46	4.93	8.65	4.93 NA	
275.252	10/18/2018	2.218	2.46	6.23	8.65	6.23 NA	
207.8474	10/23/2018	2.121	2.46	3.1	8.65	3.1 NA	
233.892	10/24/2018	2.174	2.46	4.25	8.65	4.25 NA	
281.0313	10/25/2018	2.92	2.46	2.89	8.65	2.89 NA	
196.9608	10/30/2018	2.567	2.46	0.55	8.65	0.55 NA	
211.415	10/31/2018	2.674	2.46	0.83	8.65	0.83 NA	
238.7358	11/6/2018	3.078	2.954	0.36	8.94	0.36	8.94
261.2013	12/2/2018	3.026	2.94	1.53	8.82	1.53	8.82
351.5373	1/8/2019	3.225	2.88	1.27	11.8	1.27	11.8
215.8686	2/5/2019	2.652	2.93	1.52	8.24	1.52	8.24
347.3587	3/5/2019	2.506	2.68	4.52	12.1	4.52	12.1

321.0837	4/9/2019	2.553	2.76	0.28	14.8	0.28	14.8
460.5919	5/7/2019	2.471	2.47	1.65	20.7	1.65	20.7
483.9135	6/4/2019	2.32	2.35	1.01	24	1.01	24
176.5897	7/1/2019	2.154	2.17	0.03	9.8	0.03 NA	
257.6781	7/2/2019	2.771	2.17	1.35	9.8	1.35 NA	
193.9255	7/9/2019	2.157	2.17	0.98	9.8	0.98	9.8
192.7207	7/10/2019	2.18	2.17	0.8	9.8	0.8 NA	
193.2895	7/11/2019	2.166	2.17	0.9	9.8	0.9 NA	
245.9614	7/14/2019	2.253	2.17	3.29	9.8	3.29 NA	
221.0897	7/16/2019	2.114	2.17	2.74	9.8	2.74 NA	
257.377	7/17/2019	2.121	2.17	4.75	9.8	4.75 NA	
214.8718	7/23/2019	2.147	2.17	2.2	9.8	2.2 NA	
250.6754	7/24/2019	2.15	2.17	4.18	9.8	4.18 NA	
227.8418	7/25/2019	2.141	2.17	2.96	9.8	2.96 NA	
204.9318	7/30/2019	2.133	2.17	1.72	9.8	1.72 NA	
206.4818	7/31/2019	2.151	2.17	1.71	9.8	1.71 NA	
207.5549	8/1/2019	2.067	2.12	1.34	10.7	1.34 NA	
207.7974	8/6/2019	2.085	2.12	1.25	10.7	1.25	10.7
213.0742	8/7/2019	2.089	2.12	1.53	10.7	1.53 NA	
214.1196	8/8/2019	2.089	2.12	1.59	10.7	1.59 NA	
195.794	8/13/2019	2.115	2.12	0.4	10.7	0.4 NA	
205.0039	8/14/2019	2.16	2.12	0.68	10.7	0.68 NA	
202.0525	8/15/2019	2.076	2.12	0.97	10.7	0.97 NA	
194.7013	8/20/2019	2.077	2.12	0.54	10.7	0.54 NA	
220.7807	8/21/2019	2.147	2.12	1.63	10.7	1.63 NA	
205.2105	8/22/2019	2.123	2.12	0.89	10.7	0.89 NA	
225.9653	8/25/2019	2.273	2.12	1.22	10.7	1.22 NA	
200.0399	8/27/2019	2.104	2.12	0.7	10.7	0.7 NA	
206.0957	8/28/2019	2.134	2.12	0.88	10.7	0.88 NA	
248.4466	9/2/2019	2.288	2.441	3.76	9.26	3.76 NA	
192.8455	9/3/2019	2.198	2.441	1.26	9.26	1.26 NA	
202.466	9/4/2019	2.111	2.441	2.24	9.26	2.24 NA	
204.1065	9/10/2019	2.36	2.441	1.11	9.26	1.11	9.26
186.1038	9/11/2019	2.277	2.441	0.54	9.26	0.54 NA	
202.5242	9/12/2019	2.278	2.441	1.4	9.26	1.4 NA	
210.1657	9/17/2019	2.548	2.441	0.63	9.26	0.63 NA	
250.5723	9/18/2019	2.544	2.441	2.55	9.26	2.55 NA	
231.0809	9/19/2019	2.401	2.441	2.28	9.26	2.28 NA	
199.7997	9/24/2019	2.576	2.441	0.04	9.26	0.04 NA	
192.0171	9/25/2019	2.473	2.441	0.05	9.26	0.05 NA	
207.225	9/26/2019	2.666	2.441	0.06	9.26	0.06 NA	
203.7624	9/30/2019	2.561	2.441	0.28	9.26	0.28 NA	
374.4909	10/1/2019	2.391	2.58	1.08	17.7	1.08	17.7
415.0808	10/2/2019	2.361	2.58	3.38	17.7	3.38 NA	
395.1786	10/6/2019	2.571	2.58	0.73	17.7	0.73 NA	

410.5365	10/7/2019	2.75	2.58	0.2	17.7	0.2 NA	
422.0819	10/8/2019	2.682	2.58	1.17	17.7	1.17 NA	
364.9793	10/15/2019	2.334	2.58	1.05	17.7	1.05 NA	
371.6487	10/16/2019	2.462	2.58	0.4	17.7	0.4 NA	
368.9927	10/17/2019	2.487	2.58	0.09	17.7	0.09 NA	
501.9454	10/22/2019	3.385	2.58	0.08	17.7	0.08 NA	
434.4368	10/23/2019	2.938	2.58	0.03	17.7	0.03 NA	
408.1162	10/24/2019	2.76	2.58	0.03	17.7	0.03 NA	
348.135	10/29/2019	2.332	2.58	0.2	17.7	0.2 NA	
367.2471	10/30/2019	2.346	2.58	1.07	17.7	1.07 NA	
337.7838	10/31/2019	2.269	2.58	0.15	17.7	0.15 NA	
303.4225	11/5/2019	2.232	2.52	0.3	16	0.3	16
242.6564	12/3/2019	2.311	2.94	0.09	12.5	0.09	12.5
472.0601	1/7/2020	3.531	3.42	0.13	15.9	0.13	15.9
797.7063	2/5/2020	6.911	3.64	0.04	13.8	0.04	13.8
319.8974	3/3/2020	3.17	2.83	0.1	12	0.1	12
53.50469	4/14/2020	2.477	2.6	2.22	0.37	2.22	0.37
283.2652	5/5/2020	2.715	2.72	0.31	12.2	0.31	12.2
606.3092	6/9/2020	3.306	3.035	12.9	9.09	12.9	9.09
372.7032	7/1/2020	2.649	2.45	0.07	16.8	0.07 NA	
363.0696	7/7/2020	2.579	2.45	0.08	16.8	0.08	16.8
352.2296	7/8/2020	2.502	2.45	0.08	16.8	0.08 NA	
347.0411	7/9/2020	2.471	2.45	0.04	16.8	0.04 NA	
460.9168	7/14/2020	2.74	2.45	3.37	16.8	3.37 NA	
349.1331	7/15/2020	2.424	2.45	0.47	16.8	0.47 NA	
346.6213	7/16/2020	2.401	2.45	0.51	16.8	0.51 NA	
351.5506	7/21/2020	2.455	2.45	0.37	16.8	0.37 NA	
338.114	7/22/2020	2.375	2.45	0.27	16.8	0.27 NA	
327.465	7/23/2020	2.333	2.45	0.03	16.8	0.03 NA	
331.058	7/28/2020	2.36	2.45	0.02	16.8	0.02 NA	
331.4788	7/29/2020	2.363	2.45	0.02	16.8	0.02 NA	
322.7815	7/30/2020	2.301	2.45	0.02	16.8	0.02 NA	
302.7207	8/2/2020	2.415	2.295	0.03	15	0.03 NA	
294.5715	8/3/2020	2.336	2.295	0.12	15	0.12 NA	
292.5233	8/4/2020	2.329	2.295	0.06	15	0.06 NA	
286.7357	8/11/2020	2.289	2.295	0.02	15	0.02	15
286.6201	8/12/2020	2.282	2.295	0.06	15	0.06 NA	
286.6104	8/13/2020	2.288	2.295	0.02	15	0.02 NA	
289.877	8/18/2020	2.311	2.295	0.04	15	0.04 NA	
288.6147	8/19/2020	2.304	2.295	0.02	15	0.02 NA	
282.3514	8/20/2020	2.254	2.295	0.02	15	0.02 NA	
277.8418	8/25/2020	2.218	2.295	0.02	15	0.02 NA	
269.0731	8/26/2020	2.148	2.295	0.02	15	0.02 NA	
276.2133	8/27/2020	2.205	2.295	0.02	15	0.02 NA	
290.1279	8/30/2020	2.313	2.295	0.04	15	0.04 NA	



289.8097	8/31/2020	2.312	2.295	0.03	15	0.03 NA	
240.6273	9/1/2020	2.34	2.37	0.03	12.3	0.03 NA	
243.8549	9/7/2020	2.358	2.37	0.1	12.3	0.1 NA	
234.8217	9/8/2020	2.278	2.37	0.06	12.3	0.06 NA	
228.1214	9/9/2020	2.213	2.37	0.06	12.3	0.06 NA	
243.2009	9/15/2020	2.346	2.37	0.13	12.3	0.13	12.3
237.735	9/16/2020	2.31	2.37	0.04	12.3	0.04 NA	
237.735	9/17/2020	2.31	2.37	0.04	12.3	0.04 NA	
241.3371	9/22/2020	2.345	2.37	0.04	12.3	0.04 NA	
265.2224	9/23/2020	2.575	2.37	0.05	12.3	0.05 NA	
253.3692	9/24/2020	2.45	2.37	0.1	12.3	0.1 NA	
255.8482	9/28/2020	2.486	2.37	0.04	12.3	0.04 NA	
249.1546	9/29/2020	2.419	2.37	0.05	12.3	0.05 NA	
247.1916	9/30/2020	2.398	2.37	0.06	12.3	0.06 NA	
185.1221	10/6/2020	2.374	2.68	0.29	9.06	0.29	9.06
182.5809	10/7/2020	2.354	2.68	0.24	9.06	0.24 NA	
185.555	10/8/2020	2.32	2.68	0.53	9.06	0.53 NA	
218.5747	10/11/2020	2.88	2.68	0.04	9.06	0.04 NA	
206.9624	10/12/2020	2.724	2.68	0.05	9.06	0.05 NA	
213.3445	10/13/2020	2.808	2.68	0.05	9.06	0.05 NA	
277.6144	10/18/2020	3.63	2.68	0.11	9.06	0.11 NA	
251.2573	10/19/2020	3.307	2.68	0.05	9.06	0.05 NA	
227.1724	10/20/2020	2.99	2.68	0.05	9.06	0.05 NA	
195.11	10/27/2020	2.568	2.68	0.05	9.06	0.05 NA	
193.8029	10/28/2020	2.548	2.68	0.06	9.06	0.06 NA	
190.9126	10/29/2020	2.51	2.68	0.06	9.06	0.06 NA	
330.608	11/3/2020	2.883	3.05	0.15	13.6	0.15	13.6

**ATTACHMENT B**

**REVISED PERMIT ACTION LEVEL ALTERNATIVE 1**

Data, Controls, Numeric Output

significant digits to display

Fix Random number Seed

398 Daily

145,000 Annual

Action Level based on 597 data points Over 1800 days

Please select Data file

WA0020893DAYmp002\_PlantProcess(alt1).csv

Upload complete

Earliest Data to consider for calculation

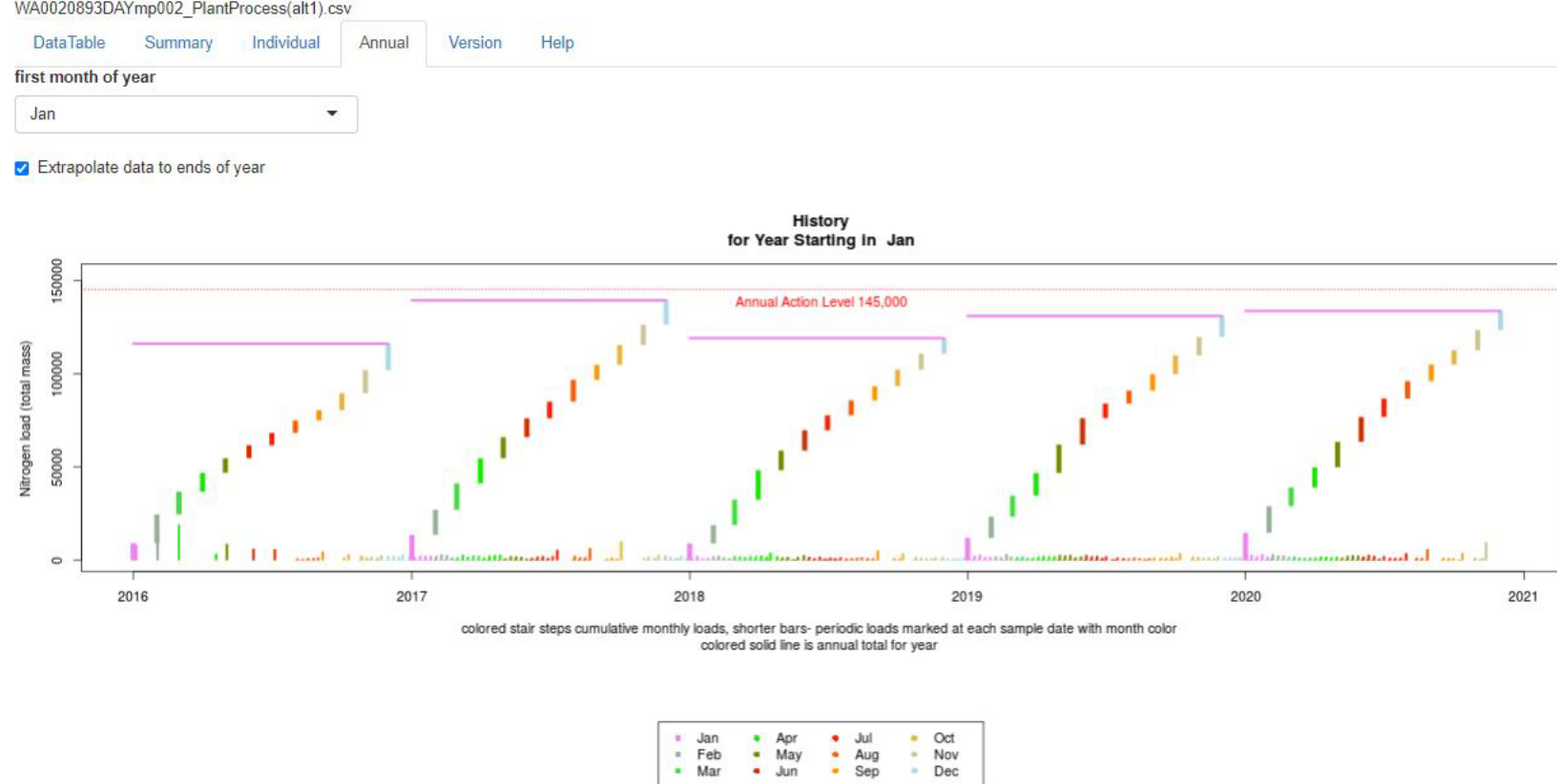
Latest Data to consider for calculation

Samples per month (per year/12)

Thousands of iterations

Confidence Level Needed

If Date is not second field input, data assumed to be sequential months starting in Jan 2015



load	POS	Q2	Qave	AMM	NIT	Ammonia	Nitrate...	Nitrite
297.7915	1/5/2016	2.511	3.12294	0.02	14.2	0.02	14.2	
540.1278	2/2/2016	2.848	2.97866	0.04	22.7	0.04	22.7	
392.5671	3/1/2016	2.92	3.07742	0.02	16.1	0.02	16.1	
256.8628	4/19/2016	2.295	2.43637	0.02	13.4	0.02	13.4	
252.4835	5/3/2016	2.29	2.22839	0.02	13.2	0.02	13.2	
224.8998	6/7/2016	2.12	2.1628	0.02	12.7	0.02	12.7	
214.6773	7/5/2016	2.254	2.09394	0.02	11.4	0.02	11.4	
187.8929	8/2/2016	2.026	2.05555	0.02	11.1	0.02	11.1	
241.3519	8/3/2016	2.073	2.05555	0.06	13.9	0.06	13.9	
202.234	8/4/2016	2.069	2.05555	0.02	11.7	0.02	11.7	
221.8307	8/9/2016	2.078	2.05555	0.4	12.4	0.4	12.4	
221.0961	8/10/2016	2.033	2.05555	0.04	13	0.04	13	
157.1263	8/11/2016	1.979	2.05555	0.02	9.5	0.02	9.5	
167.1816	8/16/2016	2.128	2.05555	0.02	9.4	0.02	9.4	
203.7399	8/17/2016	2.046	2.05555	0.14	11.8	0.14	11.8	
248.2244	8/18/2016	2.033	2.05555	0.24	14.4	0.24	14.4	
173.1119	8/23/2016	2.031	2.05555	0.02	10.2	0.02	10.2	
213.3894	8/24/2016	2.042	2.05555	0.03	12.5	0.03	12.5	
254.9905	8/25/2016	1.97	2.05555	0.02	15.5	0.02	15.5	
205.0439	8/30/2016	2.08	2.05555	0.02	11.8	0.02	11.8	
275.0138	8/31/2016	2.028	2.05555	0.16	16.1	0.16	16.1	
166.9885	9/6/2016	2.21	2.2469	0.02	9.04	0.02	9.04	
300.7656	10/4/2016	2.401	2.80587	0.02	15	0.02	15	
248.9575	10/9/2016	2.598	2.80587	0.09	11.4	0.09	11.4	
224.1545	10/10/2016	2.417	2.80587	0.02	11.1	0.02	11.1	
363.4462	10/25/2016	2.654	2.80587	0.02	16.4	0.02	16.4	
628.5941	10/26/2016	3.335	2.80587	0.4	22.2	0.4	22.2	
501.629	10/27/2016	3.213	2.80587	0.02	18.7	0.02	18.7	
418.8628	11/1/2016	3.608	3.4292	0.02	13.9	0.02	13.9	
414.3465	11/3/2016	3.082	3.4292	0.02	16.1	0.02	16.1	
337.0239	11/7/2016	2.967	3.4292	0.02	13.6	0.02	13.6	
354.814	11/8/2016	2.777	3.4292	0.02	15.3	0.02	15.3	
323.9503	11/9/2016	2.873	3.4292	0.02	13.5	0.02	13.5	
456.4727	11/15/2016	4.337	3.4292	0.02	12.6	0.02	12.6	
537.7098	11/16/2016	3.68	3.4292	0.02	17.5	0.02	17.5	
576.9969	11/17/2016	3.242	3.4292	0.04	21.3	0.04	21.3	
401.1552	11/20/2016	3.366	3.4292	0.09	14.2	0.09	14.2	
369.1162	11/21/2016	3.019	3.4292	0.06	14.6	0.06	14.6	
391.6544	11/22/2016	3.232	3.4292	0.03	14.5	0.03	14.5	
433.6627	11/29/2016	3.846	3.4292	0.02	13.5	0.02	13.5	
516.5404	11/30/2016	3.915	3.4292	0.02	15.8	0.02	15.8	
506.6041	12/1/2016	3.745	3.18406	0.02	16.2	0.02	16.2	
432.7072	12/6/2016	3.343	3.18406	0.02	15.5	0.02	15.5	
514.7851	12/7/2016	3.167	3.18406	0.09	19.4	0.09	19.4	

496.5799	12/8/2016	3.055	3.18406	0.09	19.4	0.09	19.4
346.1772	12/13/2016	3.093	3.18406	0.02	13.4	0.02	13.4
353.7481	12/14/2016	2.962	3.18406	0.02	14.3	0.02	14.3
529.4085	12/15/2016	2.888	3.18406	0.18	21.8	0.18	21.8
283.4141	12/19/2016	2.875	3.18406	0.02	11.8	0.02	11.8
451.7071	12/20/2016	2.884	3.18406	0.08	18.7	0.08	18.7
377.7532	12/27/2016	3.113	3.18406	0.05	14.5	0.05	14.5
341.4605	12/28/2016	2.969	3.18406	0.09	13.7	0.09	13.7
413.5035	12/29/2016	3.142	3.18406	0.18	15.6	0.18	15.6
426.7072	1/3/2017	2.913	2.83858	0.864	16.7	0.864	16.7
390.1681	1/4/2017	2.793	2.83858	0.05	16.7	0.05	16.7
304.05	1/5/2017	2.737	2.83858	0.02	13.3	0.02	13.3
458.7377	1/10/2017	2.742	2.83858	0.66	19.4	0.66	19.4
510.3753	1/11/2017	2.824	2.83858	0.07	21.6	0.07	21.6
470.5737	1/12/2017	2.611	2.83858	0.71	20.9	0.71	20.9
268.572	1/17/2017	3.004	2.83858	0.02	10.7	0.02	10.7
636.1155	1/18/2017	3.717	2.83858	1.12	19.4	1.12	19.4
469.4895	1/19/2017	3.49	2.83858	0.03	16.1	0.03	16.1
415.9106	1/24/2017	2.705	2.83858	0.036	18.4	0.036	18.4
560.6213	1/25/2017	2.736	2.83858	0.869	23.7	0.869	23.7
491.5954	1/26/2017	2.726	2.83858	0.023	21.6	0.023	21.6
517.6522	1/31/2017	2.555	2.83858	0.093	24.2	0.093	24.2
402.4231	2/1/2017	2.551	3.23468	0.015	18.9	0.015	18.9
484.3733	2/2/2017	2.509	3.23468	0.448	22.7	0.448	22.7
382.524	2/7/2017	2.936	3.23468	0.022	15.6	0.022	15.6
356.4386	2/8/2017	3.258	3.23468	0.018	13.1	0.018	13.1
658.3789	2/9/2017	3.989	3.23468	0.29	19.5	0.29	19.5
430.4786	2/14/2017	3.062	3.23468	0.857	16	0.857	16
498.2869	2/15/2017	4.129	3.23468	0.07	14.4	0.07	14.4
558.4894	2/16/2017	4.02	3.23468	0.158	16.5	0.158	16.5
383.3339	2/21/2017	3.311	3.23468	0.082	13.8	0.082	13.8
319.039	2/22/2017	3.264	3.23468	0.02	11.7	0.02	11.7
319.1386	2/23/2017	3.081	3.23468	0.02	12.4	0.02	12.4
532.4186	2/28/2017	3.087	3.23468	0.78	19.9	0.78	19.9
473.635	3/1/2017	3.092	3.55358	0.467	17.9	0.467	17.9
340.0501	3/2/2017	3.014	3.55358	0.028	13.5	0.028	13.5
480.5026	3/7/2017	3.702	3.55358	0.463	15.1	0.463	15.1
530.546	3/8/2017	3.498	3.55358	0.386	17.8	0.386	17.8
588.9633	3/9/2017	3.586	3.55358	0.193	19.5	0.193	19.5
348.3854	3/14/2017	3.825	3.55358	0.021	10.9	0.021	10.9
414.2561	3/15/2017	4.379	3.55358	0.043	11.3	0.043	11.3
387.0117	3/16/2017	3.83	3.55358	0.016	12.1	0.016	12.1
440.5365	3/21/2017	3.375	3.55358	0.151	15.5	0.151	15.5
469.7554	3/22/2017	3.188	3.55358	0.768	16.9	0.768	16.9
523.3032	3/23/2017	3.077	3.55358	0.492	19.9	0.492	19.9

286.1064	3/28/2017	3.358	3.55358	0.016	10.2	0.016	10.2
529.788	3/29/2017	4.002	3.55358	0.173	15.7	0.173	15.7
486.2088	3/30/2017	4.186	3.55358	0.027	13.9	0.027	13.9
364.8508	4/4/2017	3.117	3.26913	0.035	14	0.035	14
309.3084	4/5/2017	3.249	3.26913	0.015	11.4	0.015	11.4
299.2171	4/6/2017	3.143	3.26913	0.015	11.4	0.015	11.4
555.2261	4/11/2017	3.076	3.26913	0.143	21.5	0.143	21.5
562.4537	4/12/2017	3.763	3.26913	0.022	17.9	0.022	17.9
483.0354	4/13/2017	3.757	3.26913	0.016	15.4	0.016	15.4
241.0983	4/18/2017	2.858	3.26913	0.015	10.1	0.015	10.1
249.3224	4/19/2017	2.985	3.26913	0.015	10	0.015	10
570.2751	4/20/2017	3.861	3.26913	0.31	17.4	0.31	17.4
286.4402	4/25/2017	3.09	3.26913	0.015	11.1	0.015	11.1
335.4768	4/26/2017	3.376	3.26913	0.015	11.9	0.015	11.9
602.362	4/27/2017	3.193	3.26913	1.12	21.5	1.12	21.5
413.6428	5/2/2017	2.828	2.92835	0.038	17.5	0.038	17.5
258.4375	5/3/2017	2.947	2.92835	0.015	10.5	0.015	10.5
226.8469	5/4/2017	3.311	2.92835	0.015	8.2	0.015	8.2
258.7755	5/9/2017	2.869	2.92835	0.015	10.8	0.015	10.8
467.507	5/10/2017	2.8	2.92835	1.72	18.3	1.72	18.3
459.6346	5/11/2017	2.842	2.92835	0.092	19.3	0.092	19.3
327.1449	5/16/2017	3.627	2.92835	0.015	10.8	0.015	10.8
413.4631	5/18/2017	3.022	2.92835	0.105	16.3	0.105	16.3
370.3716	5/23/2017	2.844	2.92835	0.415	15.2	0.415	15.2
530.1911	5/24/2017	2.783	2.92835	0.143	22.7	0.143	22.7
372.7784	5/25/2017	2.843	2.92835	0.022	15.7	0.022	15.7
183.3326	5/30/2017	2.621	2.92835	0.087	8.3	0.087	8.3
186.3723	5/31/2017	2.576	2.92835	0.075	8.6	0.075	8.6
192.3638	6/1/2017	2.58	2.41167	0.04	8.9	0.04	8.9
391.4591	6/6/2017	2.473	2.41167	0.08	18.9	0.08	18.9
414.5547	6/7/2017	2.42	2.41167	0.14	20.4	0.14	20.4
267.9702	6/8/2017	2.526	2.41167	0.02	12.7	0.02	12.7
442.5724	6/13/2017	2.432	2.41167	0.02	21.8	0.02	21.8
407.5818	6/14/2017	2.556	2.41167	0.02	19.1	0.02	19.1
408.6021	6/15/2017	2.423	2.41167	0.02	20.2	0.02	20.2
443.3574	6/20/2017	2.346	2.41167	0.06	22.6	0.06	22.6
422.6904	6/21/2017	2.41	2.41167	0.13	20.9	0.13	20.9
459.4244	6/22/2017	2.302	2.41167	0.03	23.9	0.03	23.9
240.2085	6/27/2017	2.319	2.41167	0.02	12.4	0.02	12.4
240.6807	6/28/2017	2.305	2.41167	0.02	12.5	0.02	12.5
260.9192	6/29/2017	2.314	2.41167	0.02	13.5	0.02	13.5
315.8445	7/4/2017	2.298	2.21252	0.08	16.4	0.08	16.4
363.8046	7/5/2017	2.325	2.21252	0.462	18.3	0.462	18.3
268.3069	7/11/2017	2.453	2.21252	0.015	13.1	0.015	13.1
416.72	8/1/2017	2.109	2.08839	0.192	23.5	0.192	23.5

322.1175	8/2/2017	2.09	2.08839	0.08	18.4	0.08	18.4
493.2384	8/3/2017	2.082	2.08839	0.806	27.6	0.806	27.6
502.752	8/8/2017	2.083	2.08839	1.84	27.1	1.84	27.1
497.589	8/9/2017	2.036	2.08839	0.404	28.9	0.404	28.9
331.9212	8/10/2017	2.234	2.08839	0.015	17.8	0.015	17.8
526.1914	8/15/2017	2.149	2.08839	0.559	28.8	0.559	28.8
341.5068	8/16/2017	2.077	2.08839	0.015	19.7	0.015	19.7
408.6392	8/17/2017	2.085	2.08839	0.5	23	0.5	23
197.9231	8/21/2017	2.079	2.08839	0.015	11.4	0.015	11.4
207.7162	8/22/2017	2.108	2.08839	0.015	11.8	0.015	11.8
330.4838	8/23/2017	2.107	2.08839	0.307	18.5	0.307	18.5
317.5117	9/12/2017	2.058	2.09257	0.099	18.4	0.099	18.4
221.95	9/13/2017	2.161	2.09257	0.015	12.3	0.015	12.3
178.7359	9/14/2017	2.018	2.09257	0.02	10.6	0.02	10.6
270.9369	9/19/2017	2.149	2.09257	0.017	15.1	0.017	15.1
278.4697	9/20/2017	2.063	2.09257	0.015	16.17	0.015	16.17
298.6989	9/21/2017	2.073	2.09257	0.077	17.2	0.077	17.2
168.7075	9/26/2017	2.061	2.09257	0.015	9.8	0.015	9.8
194.3962	9/27/2017	2.06	2.09257	0.015	11.3	0.015	11.3
186.5106	9/28/2017	2.012	2.09257	0.015	11.1	0.015	11.1
351.6004	10/3/2017	2.055	2.291	0.015	20.5	0.015	20.5
281.4531	11/1/2017	2.325	NA	0.015	14.5	0.015	14.5
350.8232	11/2/2017	2.37	NA	0.049	17.7	0.049	17.7
255.1031	11/6/2017	2.507	NA	0.301	11.9	0.301	11.9
343.4372	11/7/2017	2.368	NA	1.19	16.2	1.19	16.2
262.9916	11/8/2017	2.331	NA	0.028	13.5	0.028	13.5
504.7145	11/15/2017	3.505	NA	0.366	16.9	0.366	16.9
458.264	11/16/2017	2.846	NA	0.407	18.9	0.407	18.9
301.0809	11/19/2017	2.837	NA	0.325	12.4	0.325	12.4
330.6635	11/20/2017	3.084	NA	0.056	12.8	0.056	12.8
434.3144	11/21/2017	3.656	NA	0.044	14.2	0.044	14.2
375.6584	11/28/2017	3.878	NA	0.015	11.6	0.015	11.6
346.8627	11/29/2017	3.35	NA	0.015	12.4	0.015	12.4
517.0583	11/30/2017	3.56	NA	0.015	17.4	0.015	17.4
409.3997	12/5/2017	2.905	3.134	0.098	16.8	0.098	16.8
581.6562	12/6/2017	2.798	3.134	0.826	24.1	0.826	24.1
431.1927	12/7/2017	2.72	3.134	0.108	18.9	0.108	18.9
314.3968	12/12/2017	2.477	3.134	0.219	15	0.219	15
484.3208	12/13/2017	2.468	3.134	1.13	22.4	1.13	22.4
450.4609	12/14/2017	2.416	3.134	0.356	22	0.356	22
370.5126	12/17/2017	3.756	3.134	0.628	11.2	0.628	11.2
505.7604	12/20/2017	4.076	3.134	0.178	14.7	0.178	14.7
500.6025	12/21/2017	3.502	3.134	1.24	15.9	1.24	15.9
231.0938	12/26/2017	2.844	3.134	0.543	9.2	0.543	9.2
239.7612	12/27/2017	2.707	3.134	0.42	10.2	0.42	10.2

294.6593	12/28/2017	2.714	3.134	0.818	12.2	0.818	12.2
245.2278	1/2/2018	3.077	3.624	0.156	9.4	0.156	9.4
203.263	1/3/2018	2.794	3.624	0.023	8.7	0.023	8.7
255.9601	1/4/2018	2.73	3.624	0.442	10.8	0.442	10.8
394.2969	1/9/2018	4.357	3.624	0.751	10.1	0.751	10.1
429.764	1/10/2018	4.047	3.624	0.233	12.5	0.233	12.5
488.5214	1/11/2018	4.959	3.624	0.312	11.5	0.312	11.5
209.3895	1/16/2018	3.297	3.624	0.015	7.6	0.015	7.6
226.22	1/17/2018	3.427	3.624	0.015	7.9	0.015	7.9
221.798	1/18/2018	3.686	3.624	0.015	7.2	0.015	7.2
226.5858	1/23/2018	3.664	3.624	0.015	7.4	0.015	7.4
230.5231	1/24/2018	3.831	3.624	0.015	7.2	0.015	7.2
241.4402	1/25/2018	3.524	3.624	0.015	8.2	0.015	8.2
288.7986	1/30/2018	4.375	3.624	0.015	7.9	0.015	7.9
256.3014	1/31/2018	3.652	3.624	0.015	8.4	0.015	8.4
433.8048	2/1/2018	3.726	3.74	1.76	12.2	1.76	12.2
265.6018	2/6/2018	4.476	3.74	0.015	7.1	0.015	7.1
371.831	2/7/2018	4.059	3.74	0.484	10.5	0.484	10.5
475.4747	2/8/2018	3.736	3.74	1.06	14.2	1.06	14.2
301.3591	2/13/2018	3.021	3.74	0.261	11.7	0.261	11.7
333.3962	2/14/2018	3.196	3.74	0.608	11.9	0.608	11.9
317.7422	2/15/2018	2.998	3.74	0.308	12.4	0.308	12.4
219.8916	2/20/2018	3.461	3.74	0.018	7.6	0.018	7.6
247.7147	2/21/2018	3.294	3.74	0.017	9	0.017	9
232.8798	2/22/2018	2.989	3.74	0.042	9.3	0.042	9.3
320.2038	2/27/2018	2.996	3.74	0.015	12.8	0.015	12.8
477.1398	2/28/2018	3.186	3.74	0.457	17.5	0.457	17.5
467.8956	3/1/2018	3.196	3.08394	0.154	17.4	0.154	17.4
384.1466	3/6/2018	2.838	3.08394	1.43	14.8	1.43	14.8
334.4518	3/7/2018	2.767	3.08394	0.393	14.1	0.393	14.1
429.0895	3/8/2018	3.49	3.08394	0.742	14	0.742	14
345.4511	3/13/2018	3	3.08394	0.807	13	0.807	13
483.9916	3/14/2018	3.005	3.08394	0.612	18.7	0.612	18.7
353.4791	3/15/2018	2.938	3.08394	0.026	14.4	0.026	14.4
452.6957	3/20/2018	2.624	3.08394	0.186	20.5	0.186	20.5
390.2512	3/21/2018	2.621	3.08394	0.053	17.8	0.053	17.8
438.6573	3/22/2018	2.931	3.08394	0.045	17.9	0.045	17.9
694.5532	3/27/2018	3.729	3.08394	0.533	21.8	0.533	21.8
741.9288	3/28/2018	3.478	3.08394	0.478	25.1	0.478	25.1
474.2308	3/29/2018	3.174	3.08394	0.015	17.9	0.015	17.9
385.7217	4/3/2018	2.98	3.5245	0.12	15.4	0.12	15.4
549.5935	4/4/2018	3.306	3.5245	0.533	19.4	0.533	19.4
531.9035	4/5/2018	3.56	3.5245	0.015	17.9	0.015	17.9
566.9059	4/10/2018	3.506	3.5245	0.288	19.1	0.288	19.1
725.0496	4/11/2018	3.534	3.5245	0.7	23.9	0.7	23.9



671.0012	4/12/2018	3.557	3.5245	0.519	22.1	0.519	22.1
425.5922	4/15/2018	4.92	3.5245	0.072	10.3	0.072	10.3
603.4126	4/16/2018	5.265	3.5245	0.442	13.3	0.442	13.3
590.5415	4/17/2018	4.573	3.5245	0.684	14.8	0.684	14.8
272.1383	4/24/2018	2.833	3.5245	0.018	11.5	0.018	11.5
301.5945	4/25/2018	2.797	3.5245	0.029	12.9	0.029	12.9
434.1614	4/26/2018	2.705	3.5245	0.945	18.3	0.945	18.3
478.4953	5/1/2018	2.66	2.55	0.069	21.5	0.069	21.5
373.2621	5/2/2018	2.71	2.55	0.015	16.5	0.015	16.5
322.0066	5/3/2018	2.66	2.55	0.015	14.5	0.015	14.5
550.5714	5/8/2018	2.67	2.55	0.125	24.6	0.125	24.6
453.9081	5/9/2018	2.661	2.55	0.053	20.4	0.053	20.4
375.6914	5/10/2018	2.695	2.55	0.015	16.7	0.015	16.7
287.1764	5/15/2018	2.683	2.55	0.034	12.8	0.034	12.8
240.8323	5/16/2018	2.573	2.55	0.023	11.2	0.023	11.2
227.7308	5/17/2018	2.546	2.55	0.025	10.7	0.025	10.7
228.7513	5/20/2018	2.657	2.55	0.223	10.1	0.223	10.1
496.7146	5/22/2018	2.513	2.55	1.7	22	1.7	22
306.9656	5/23/2018	2.433	2.55	0.028	15.1	0.028	15.1
244.1749	5/29/2018	2.478	2.55	0.015	11.8	0.015	11.8
432.3226	5/30/2018	2.444	2.55	1.11	20.1	1.11	20.1
568.6574	5/31/2018	2.409	2.55	0.704	27.6	0.704	27.6
406.3226	6/5/2018	2.386	2.47	0.019	20.4	0.019	20.4
273.1087	6/6/2018	2.423	2.47	0.015	13.5	0.015	13.5
383.7867	6/7/2018	2.381	2.47	0.627	18.7	0.627	18.7
225.4209	6/12/2018	2.646	2.47	0.015	10.2	0.015	10.2
268.218	6/13/2018	2.722	2.47	0.015	11.8	0.015	11.8
231.7475	6/14/2018	2.667	2.47	0.019	10.4	0.019	10.4
247.5974	6/19/2018	3.03	2.47	0.298	9.5	0.298	9.5
202.3793	6/20/2018	2.35	2.47	0.826	9.5	0.826	9.5
524.3441	6/21/2018	2.206	2.47	12.6	15.9	12.6	15.9
346.4417	6/25/2018	3.088	2.47	0.752	12.7	0.752	12.7
247.1716	6/26/2018	2.184	2.47	0.27	13.3	0.27	13.3
225.4481	6/27/2018	2.124	2.47	0.227	12.5	0.227	12.5
320.3383	6/28/2018	2.261	2.47	0.788	16.2	0.788	16.2
245.0614	7/1/2018	2.532	2.2261	0.405	11.2	0.405	11.2
418.2705	7/4/2018	2.359	2.2261	4.56	16.7	4.56	16.7
304.6091	7/5/2018	2.376	2.2261	0.272	15.1	0.272	15.1
445.1874	7/10/2018	2.162	2.2261	5.99	18.7	5.99	18.7
231.3031	7/12/2018	2.202	2.2261	0.095	12.5	0.095	12.5
202.7061	7/16/2018	2.214	2.2261	0.178	10.8	0.178	10.8
283.1839	7/18/2018	2.185	2.2261	1.84	13.7	1.84	13.7
172.3455	7/24/2018	2.165	2.2261	0.045	9.5	0.045	9.5
176.6637	7/25/2018	2.117	2.2261	0.106	9.9	0.106	9.9
178.9085	7/26/2018	2.173	2.2261	0.072	9.8	0.072	9.8

187.1017	7/31/2018	2.153	2.2261	0.12	10.3	0.12	10.3
204.3296	8/1/2018	2.177	2.15	0.454	10.8	0.454	10.8
257.9629	8/2/2018	2.12	2.15	1.69	12.9	1.69	12.9
230.2113	8/7/2018	2.156	2.15	0.303	12.5	0.303	12.5
331.1407	8/8/2018	2.121	2.15	4.22	14.5	4.22	14.5
288.8736	8/9/2018	2.209	2.15	1.48	14.2	1.48	14.2
140.7647	8/14/2018	2.017	2.15	0.268	8.1	0.268	8.1
281.3332	8/15/2018	2.212	2.15	4.15	11.1	4.15	11.1
280.6418	8/21/2018	2.178	2.15	3.05	12.4	3.05	12.4
225.3171	8/22/2018	2.134	2.15	1.46	11.2	1.46	11.2
238.2084	8/23/2018	2.046	2.15	1.96	12	1.96	12
201.9661	8/28/2018	2.168	2.15	1.07	10.1	1.07	10.1
192.4609	8/29/2018	2.05	2.15	0.857	10.4	0.857	10.4
285.5566	8/30/2018	2.026	2.15	5.6	11.3	5.6	11.3
208.2164	9/3/2018	2.28	2.37	1.35	9.6	1.35	9.6
194.404	9/4/2018	2.184	2.37	0.373	10.3	0.373	10.3
269.7501	9/5/2018	2.103	2.37	3.38	12	3.38	12
187.4108	9/25/2018	2.422	2.37	0.978	8.3	0.978	8.3
184.4927	9/26/2018	2.371	2.37	1.73	7.6	1.73	7.6
233.5804	9/27/2018	2.237	2.37	4.02	8.5	4.02	8.5
277.1335	10/2/2018	2.564	2.46	4.66	8.3	4.66	8.3
396.0604	10/3/2018	2.522	2.46	7.33	11.5	7.33	11.5
414.8491	10/4/2018	2.43	2.46	8.47	12	8.47	12
262.4379	10/7/2018	2.651	2.46	3.57	8.3	3.57	8.3
251.6602	10/8/2018	2.668	2.46	3.11	8.2	3.11	8.2
201.6562	10/23/2018	2.121	2.46	3.1	8.3	3.1	8.3
258.369	10/24/2018	2.174	2.46	4.25	10	4.25	10
352.8721	10/25/2018	2.92	2.46	2.89	11.6	2.89	11.6
225.8412	10/30/2018	2.567	2.46	0.549	10	0.549	10
261.5703	10/31/2018	2.674	2.46	0.829	10.9	0.829	10.9
292.7719	11/1/2018	3.313	2.954	0.896	9.7	0.896	9.7
258.1941	11/6/2018	3.078	2.954	0.358	9.7	0.358	9.7
268.8833	11/7/2018	2.904	2.954	0.402	10.7	0.402	10.7
261.8538	11/8/2018	2.648	2.954	0.857	11	0.857	11
245.6735	11/13/2018	2.409	2.954	0.928	11.3	0.928	11.3
306.9754	11/14/2018	2.487	2.954	3.2	11.6	3.2	11.6
346.5753	11/15/2018	2.551	2.954	4.19	12.1	4.19	12.1
289.9755	11/18/2018	2.727	2.954	3.15	9.6	3.15	9.6
233.1249	11/19/2018	2.498	2.954	1.69	9.5	1.69	9.5
238.5553	11/20/2018	2.335	2.954	1.65	10.6	1.65	10.6
289.984	11/27/2018	3.535	2.954	0.636	9.2	0.636	9.2
387.0401	11/28/2018	3.296	2.954	2.48	11.6	2.48	11.6
374.4984	11/29/2018	3.114	2.954	2.72	11.7	2.72	11.7
243.7207	12/4/2018	2.593	2.94	1.17	10.1	1.17	10.1
229.0257	12/5/2018	2.524	2.94	1.38	9.5	1.38	9.5

224.7	12/6/2018	2.465	2.94	1.03	9.9	1.03	9.9
219.2814	12/11/2018	2.719	2.94	1.67	8	1.67	8
215.7817	12/12/2018	2.735	2.94	1.26	8.2	1.26	8.2
270.0098	12/13/2018	2.753	2.94	2.96	8.8	2.96	8.8
288.5426	12/16/2018	3.516	2.94	2.44	7.4	2.44	7.4
261.1474	12/19/2018	2.878	2.94	1.98	8.9	1.98	8.9
265.0822	12/21/2018	2.908	2.94	2.33	8.6	2.33	8.6
214.3806	12/25/2018	2.791	2.94	2.81	6.4	2.81	6.4
226.2498	12/26/2018	2.743	2.94	3.29	6.6	3.29	6.6
300.3651	12/27/2018	2.625	2.94	6.62	7.1	6.62	7.1
205.4993	1/1/2019	3.042	2.88	1.4	6.7	1.4	6.7
187.4386	1/2/2019	2.827	2.88	1.25	6.7	1.25	6.7
241.6654	1/3/2019	2.889	2.88	1.93	8.1	1.93	8.1
381.1234	1/8/2019	3.225	2.88	1.27	12.9	1.27	12.9
492.8793	1/9/2019	3.452	2.88	1.22	15.9	1.22	15.9
484.8658	1/10/2019	3.347	2.88	1.17	16.2	1.17	16.2
297.2376	1/15/2019	2.64	2.88	1.9	11.6	1.9	11.6
416.4079	1/16/2019	2.67	2.88	4.5	14.2	4.5	14.2
604.6884	1/17/2019	2.562	2.88	10.1	18.2	10.1	18.2
236.7951	1/22/2019	2.657	2.88	1.886	8.8	1.886	8.8
318.2219	1/23/2019	2.895	2.88	2.68	10.5	2.68	10.5
365.3396	1/24/2019	2.743	2.88	2.77	13.2	2.77	13.2
304.1451	1/29/2019	2.491	2.88	3.64	11	3.64	11
336.3234	1/30/2019	2.497	2.88	2.75	13.4	2.75	13.4
355.0958	1/31/2019	2.487	2.88	3.02	14.1	3.02	14.1
223.8309	2/5/2019	2.652	2.93	1.52	8.6	1.52	8.6
210.9329	2/6/2019	2.547	2.93	1.23	8.7	1.23	8.7
428.9362	2/7/2019	2.426	2.93	10.3	10.9	10.3	10.9
226.6905	2/12/2019	2.657	2.93	1.83	8.4	1.83	8.4
268.1831	2/13/2019	3.125	2.93	1.39	8.9	1.39	8.9
328.7053	2/14/2019	3.326	2.93	2.15	9.7	2.15	9.7
264.0451	2/19/2019	3.393	2.93	0.531	8.8	0.531	8.8
542.6492	2/20/2019	3.335	2.93	5.71	13.8	5.71	13.8
679.5766	2/21/2019	3.134	2.93	9.9	16.1	9.9	16.1
431.9415	2/26/2019	2.895	2.93	2.79	15.1	2.79	15.1
337.8566	2/27/2019	2.719	2.93	0.599	14.3	0.599	14.3
351.5387	3/5/2019	2.506	2.68	4.52	12.3	4.52	12.3
439.4263	3/6/2019	2.509	2.68	6.4	14.6	6.4	14.6
350.2975	3/7/2019	2.655	2.68	1.62	14.2	1.62	14.2
660.2638	3/12/2019	3.528	2.68	6.74	15.7	6.74	15.7
440.9361	3/13/2019	3.126	2.68	0.613	16.3	0.613	16.3
422.129	3/14/2019	2.952	2.68	0.946	16.2	0.946	16.2
352.4667	3/19/2019	2.658	2.68	2.2	13.7	2.2	13.7
406.9578	3/20/2019	2.615	2.68	1.86	16.8	1.86	16.8
275.6121	3/21/2019	2.618	2.68	0.323	12.3	0.323	12.3

441.3161	3/26/2019	2.515	2.68	2.64	18.4	2.64	18.4
305.271	3/27/2019	2.451	2.68	0.134	14.8	0.134	14.8
288.459	3/28/2019	2.47	2.68	0.103	13.9	0.103	13.9
272.4384	4/2/2019	2.339	2.76	0.766	13.2	0.766	13.2
340.4759	4/3/2019	2.313	2.76	1.15	16.5	1.15	16.5
369.7872	4/4/2019	2.278	2.76	0.264	19.2	0.264	19.2
346.6341	4/9/2019	2.553	2.76	0.28	16	0.28	16
457.8269	4/11/2019	2.815	2.76	0.301	19.2	0.301	19.2
387.6895	4/16/2019	3.091	2.76	0.139	14.9	0.139	14.9
443.8649	4/17/2019	2.943	2.76	0.084	18	0.084	18
438.3442	4/18/2019	2.987	2.76	0.196	17.4	0.196	17.4
331.4237	4/23/2019	2.828	2.76	0.252	13.8	0.252	13.8
485.4382	4/24/2019	2.765	2.76	0.251	20.8	0.251	20.8
453.875	4/25/2019	2.639	2.76	0.022	20.6	0.022	20.6
432.8662	4/30/2019	2.507	2.76	0.403	20.3	0.403	20.3
590.375	5/1/2019	2.525	2.47	0.335	27.7	0.335	27.7
577.977	5/2/2019	2.449	2.47	0.198	28.1	0.198	28.1
487.3825	5/7/2019	2.471	2.47	1.65	22	1.65	22
594.3931	5/8/2019	2.586	2.47	2.36	25.2	2.36	25.2
526.2206	5/9/2019	2.4	2.47	1.19	25.1	1.19	25.1
323.0376	5/14/2019	2.296	2.47	6.17	10.7	6.17	10.7
421.7558	5/15/2019	2.324	2.47	8.56	13.2	8.56	13.2
590.8823	5/16/2019	2.567	2.47	10.4	17.2	10.4	17.2
703.5908	5/21/2019	2.474	2.47	15.7	18.4	15.7	18.4
440.6989	5/22/2019	2.359	2.47	2.3	20.1	2.3	20.1
323.6912	5/23/2019	2.405	2.47	0.338	15.8	0.338	15.8
252.7796	5/28/2019	2.423	2.47	0.109	12.4	0.109	12.4
462.2255	5/29/2019	2.448	2.47	2.84	19.8	2.84	19.8
413.1922	5/30/2019	2.325	2.47	0.109	21.2	0.109	21.2
509.8989	6/4/2019	2.32	2.35	0.753	25.6	0.753	25.6
534.2829	6/5/2019	2.326	2.35	0.342	27.2	0.342	27.2
586.1485	6/6/2019	2.4	2.35	0.284	29	0.284	29
516.9911	6/11/2019	2.381	2.35	0.335	25.7	0.335	25.7
510.8707	6/12/2019	2.439	2.35	0.115	25	0.115	25
431.6451	6/13/2019	2.297	2.35	0.032	22.5	0.032	22.5
337.0054	6/18/2019	2.315	2.35	0.155	17.3	0.155	17.3
534.7637	6/19/2019	2.319	2.35	0.05	27.6	0.05	27.6
470.5536	6/20/2019	2.21	2.35	0.03	25.5	0.03	25.5
396.2744	6/25/2019	2.335	2.35	0.049	20.3	0.049	20.3
503.641	6/26/2019	2.256	2.35	0.068	26.7	0.068	26.7
468.5209	6/27/2019	2.226	2.35	0.037	25.2	0.037	25.2
304.8395	6/30/2019	2.353	2.35	0.034	15.5	0.034	15.5
243.1117	7/1/2019	2.154	2.17	0.033	13.5	0.033	13.5
308.5204	7/2/2019	2.771	2.17	1.35	12	1.35	12
219.0567	7/9/2019	2.157	2.17	0.977	11.2	0.977	11.2

203.684	7/10/2019	2.18	2.17	0.803	10.4	0.803	10.4
225.8778	7/11/2019	2.166	2.17	0.904	11.6	0.904	11.6
223.4133	7/14/2019	2.253	2.17	3.29	8.6	3.29	8.6
226.379	7/16/2019	2.114	2.17	2.74	10.1	2.74	10.1
259.1459	7/17/2019	2.121	2.17	4.75	9.9	4.75	9.9
213.0812	7/23/2019	2.147	2.17	2.2	9.7	2.2	9.7
245.2961	7/24/2019	2.15	2.17	4.18	9.5	4.18	9.5
227.8418	7/25/2019	2.141	2.17	2.96	9.8	2.96	9.8
229.8367	7/30/2019	2.133	2.17	1.72	11.2	1.72	11.2
226.2151	7/31/2019	2.151	2.17	1.71	10.9	1.71	10.9
207.5549	8/1/2019	2.067	2.12	1.34	10.7	1.34	10.7
218.2307	8/6/2019	2.085	2.12	1.25	11.3	1.25	11.3
225.2698	8/7/2019	2.089	2.12	1.53	11.4	1.53	11.4
224.5729	8/8/2019	2.089	2.12	1.59	11.3	1.59	11.3
240.1776	8/15/2019	2.076	2.12	0.972	12.9	0.972	12.9
196.4682	8/20/2019	2.077	2.12	0.542	10.8	0.542	10.8
242.2679	8/21/2019	2.147	2.12	1.63	11.9	1.63	11.9
238.9223	8/22/2019	2.123	2.12	0.894	12.6	0.894	12.6
225.9653	8/25/2019	2.273	2.12	1.22	10.7	1.22	10.7
217.5873	8/27/2019	2.104	2.12	0.7	11.7	0.7	11.7
231.0123	8/28/2019	2.134	2.12	0.88	12.1	0.88	12.1
235.8525	9/2/2019	2.288	2.441	3.76	8.6	3.76	8.6
204.5775	9/3/2019	2.198	2.441	1.26	9.9	1.26	9.9
230.4809	9/10/2019	2.36	2.441	1.11	10.6	1.11	10.6
243.739	9/11/2019	2.277	2.441	0.535	12.3	0.535	12.3
269.779	9/12/2019	2.278	2.441	1.4	12.8	1.4	12.8
293.9557	9/17/2019	2.548	2.441	0.633	13.2	0.633	13.2
374.4793	9/18/2019	2.544	2.441	2.55	15.1	2.55	15.1
275.9354	9/19/2019	2.401	2.441	2.28	11.5	2.28	11.5
284.3816	9/24/2019	2.576	2.441	0.037	13.2	0.037	13.2
436.1943	9/25/2019	2.473	2.441	0.049	21.1	0.049	21.1
501.6757	9/26/2019	2.666	2.441	0.063	22.5	0.063	22.5
360.4928	9/30/2019	2.561	2.441	0.278	16.6	0.278	16.6
394.4318	10/1/2019	2.391	2.58	1.08	18.7	1.08	18.7
340.256	10/2/2019	2.361	2.58	3.38	13.9	3.38	13.9
268.7558	10/6/2019	2.571	2.58	0.734	11.8	0.734	11.8
265.9543	10/7/2019	2.75	2.58	0.196	11.4	0.196	11.4
499.0094	10/22/2019	3.385	2.58	0.076	17.6	0.076	17.6
458.9887	10/23/2019	2.938	2.58	0.032	18.7	0.032	18.7
403.5586	10/24/2019	2.76	2.58	0.032	17.5	0.032	17.5
301.4382	10/29/2019	2.332	2.58	0.199	15.3	0.199	15.3
377.0299	10/30/2019	2.346	2.58	1.07	18.2	1.07	18.2
362.441	10/31/2019	2.269	2.58	0.153	19	0.153	19
286.725	11/5/2019	2.232	2.52	0.303	15.1	0.303	15.1
347.6173	11/6/2019	2.282	2.52	0.065	18.2	0.065	18.2

308.3958	11/7/2019	2.264	2.52	0.033	16.3	0.033	16.3
301.7105	11/12/2019	2.301	2.52	0.022	15.7	0.022	15.7
401.9089	11/13/2019	2.254	2.52	1.48	19.9	1.48	19.9
333.3875	11/14/2019	2.281	2.52	0.025	17.5	0.025	17.5
403.6107	11/19/2019	3.019	2.52	0.03	16	0.03	16
358.9806	11/20/2019	2.829	2.52	0.015	15.2	0.015	15.2
360.0025	11/21/2019	2.598	2.52	0.015	16.6	0.015	16.6
273.4094	11/24/2019	2.881	2.52	0.079	11.3	0.079	11.3
250.5752	11/25/2019	2.679	2.52	0.015	11.2	0.015	11.2
302.1104	11/26/2019	2.607	2.52	0.095	13.8	0.095	13.8
279.2958	12/3/2019	2.311	2.94	0.091	14.4	0.091	14.4
279.555	12/4/2019	2.423	2.94	0.034	13.8	0.034	13.8
321.6192	12/5/2019	2.351	2.94	0.103	16.3	0.103	16.3
379.3479	12/10/2019	2.564	2.94	0.24	17.5	0.24	17.5
400.9158	12/11/2019	2.566	2.94	0.034	18.7	0.034	18.7
421.6414	12/12/2019	2.884	2.94	0.03	17.5	0.03	17.5
345.3212	12/16/2019	2.716	2.94	0.445	14.8	0.445	14.8
394.669	12/17/2019	2.595	2.94	0.136	18.1	0.136	18.1
390.666	12/18/2019	2.553	2.94	0.148	18.2	0.148	18.2
470.6262	12/22/2019	4.125	2.94	0.08	13.6	0.08	13.6
274.1829	12/25/2019	2.983	2.94	0.321	10.7	0.321	10.7
360.4794	12/26/2019	2.853	2.94	2.25	12.9	2.25	12.9
296.2197	12/30/2019	2.65	2.94	0.503	12.9	0.503	12.9
299.3096	12/31/2019	2.833	2.94	0.568	12.1	0.568	12.1
225.1343	1/2/2020	2.947	3.42	0.06	9.1	0.06	9.1
473.3853	1/7/2020	3.531	3.42	0.175	15.9	0.175	15.9
527.2238	1/8/2020	3.607	3.42	0.126	17.4	0.126	17.4
591.2864	1/9/2020	3.449	3.42	0.156	20.4	0.156	20.4
486.7552	1/14/2020	3.341	3.42	0.169	17.3	0.169	17.3
451.8508	1/15/2020	3.228	3.42	0.084	16.7	0.084	16.7
430.3984	1/16/2020	3.201	3.42	0.022	16.1	0.022	16.1
464.0625	1/21/2020	3.271	3.42	0.111	16.9	0.111	16.9
572.7686	1/22/2020	3.545	3.42	0.073	19.3	0.073	19.3
671.5293	1/23/2020	3.676	3.42	0.904	21	0.904	21
495.3985	1/28/2020	3.681	3.42	0.037	16.1	0.037	16.1
446.2546	1/29/2020	3.445	3.42	0.032	15.5	0.032	15.5
462.267	1/30/2020	3.335	3.42	0.02	16.6	0.02	16.6
432.698	2/3/2020	3.401	3.64	0.255	15	0.255	15
515.0403	2/4/2020	3.874	3.64	0.041	15.9	0.041	15.9
650.6581	2/6/2020	6.699	3.64	0.046	11.6	0.046	11.6
475.0851	2/11/2020	3.512	3.64	0.12	16.1	0.12	16.1
467.8927	2/12/2020	3.261	3.64	0.204	17	0.204	17
530.7572	2/13/2020	3.35	3.64	0.097	18.9	0.097	18.9
339.8397	2/18/2020	3.04	3.64	0.104	13.3	0.104	13.3
454.5345	2/19/2020	2.972	3.64	0.538	17.8	0.538	17.8

510.8283	2/20/2020	2.82	3.64	0.52	21.2	0.52	21.2
287.6027	2/25/2020	2.759	3.64	0.399	12.1	0.399	12.1
317.1885	2/26/2020	2.7	3.64	0.186	13.9	0.186	13.9
364.0745	2/27/2020	2.651	3.64	0.867	15.6	0.867	15.6
359.5012	3/3/2020	3.17	2.83	0.098	13.5	0.098	13.5
358.4385	3/4/2020	3.062	2.83	0.036	14	0.036	14
409.3544	3/5/2020	3.288	2.83	0.028	14.9	0.028	14.9
369.8903	3/10/2020	2.944	2.83	0.165	14.9	0.165	14.9
295.6656	3/11/2020	2.865	2.83	0.074	12.3	0.074	12.3
290.0877	3/12/2020	2.808	2.83	0.087	12.3	0.087	12.3
325.9526	3/17/2020	2.616	2.83	1.14	13.8	1.14	13.8
293.975	3/18/2020	2.626	2.83	0.723	12.7	0.723	12.7
269.3644	3/19/2020	2.594	2.83	0.251	12.2	0.251	12.2
364.579	3/24/2020	2.605	2.83	0.981	15.8	0.981	15.8
316.547	3/25/2020	2.614	2.83	1.02	13.5	1.02	13.5
294.4469	3/26/2020	2.546	2.83	0.567	13.3	0.567	13.3
365.4234	3/31/2020	2.825	2.83	1.11	14.4	1.11	14.4
325.0226	4/1/2020	2.741	2.6	0.518	13.7	0.518	13.7
311.8634	4/2/2020	2.715	2.6	0.573	13.2	0.573	13.2
382.5749	4/7/2020	2.567	2.6	3.07	14.8	3.07	14.8
398.2644	4/8/2020	2.532	2.6	2.06	16.8	2.06	16.8
401.3771	4/9/2020	2.575	2.6	3.69	15	3.69	15
328.8782	4/14/2020	2.477	2.6	2.22	13.7	2.22	13.7
354.7476	4/15/2020	2.508	2.6	2.36	14.6	2.36	14.6
391.867	4/16/2020	2.555	2.6	1.49	16.9	1.49	16.9
361.2888	4/21/2020	2.375	2.6	2.84	15.4	2.84	15.4
364.9567	4/22/2020	2.898	2.6	1.3	13.8	1.3	13.8
322.921	4/23/2020	2.791	2.6	0.473	13.4	0.473	13.4
376.2781	4/28/2020	2.587	2.6	1.34	16.1	1.34	16.1
400.8136	4/29/2020	2.507	2.6	4.17	15	4.17	15
389.978	4/30/2020	2.565	2.6	1.53	16.7	1.53	16.7
308.2179	5/5/2020	2.715	2.72	0.312	13.3	0.312	13.3
317.7327	5/6/2020	2.869	2.72	0.179	13.1	0.179	13.1
306.8097	5/7/2020	2.702	2.72	0.315	13.3	0.315	13.3
400.7328	5/12/2020	3.11	2.72	7.85	7.6	7.85	7.6
472.8705	5/13/2020	2.589	2.72	15.1	6.8	15.1	6.8
471.7671	5/14/2020	2.481	2.72	15.1	7.7	15.1	7.7
409.8867	5/19/2020	2.599	2.72	9.01	9.9	9.01	9.9
465.5997	5/20/2020	2.621	2.72	11.9	9.4	11.9	9.4
555.2288	5/21/2020	2.541	2.72	18.5	7.7	18.5	7.7
449.2041	5/26/2020	2.602	2.72	12.5	8.2	12.5	8.2
509.162	5/27/2020	2.609	2.72	13.5	9.9	13.5	9.9
521.8171	5/28/2020	2.64	2.72	13.3	10.4	13.3	10.4
605.901	6/2/2020	2.906	3.035	15.1	9.9	15.1	9.9
602.8727	6/3/2020	2.791	3.035	15.3	10.6	15.3	10.6

411.641	6/4/2020	2.624	3.035	7.31	11.5	7.31	11.5
639.6713	6/9/2020	3.306	3.035	12.9	10.3	12.9	10.3
448.0406	6/10/2020	2.955	3.035	7.78	10.4	7.78	10.4
602.6217	6/11/2020	3.036	3.035	12.8	11	12.8	11
474.4157	6/16/2020	3.689	3.035	6.52	8.9	6.52	8.9
520.2859	6/17/2020	3.354	3.035	9	9.6	9	9.6
488.2831	6/18/2020	3.163	3.035	8.01	10.5	8.01	10.5
321.9514	6/23/2020	2.868	3.035	2.66	10.8	2.66	10.8
233.5526	6/24/2020	2.859	3.035	0.495	9.3	0.495	9.3
228.6359	6/25/2020	2.753	3.035	0.158	9.8	0.158	9.8
253.6305	6/29/2020	2.572	3.035	0.024	11.8	0.024	11.8
308.0378	6/30/2020	2.571	3.035	0.166	14.2	0.166	14.2
377.0333	7/1/2020	2.649	2.45	0.066	17	0.066	17
399.5271	7/7/2020	2.579	2.45	0.075	18.5	0.075	18.5
364.833	7/8/2020	2.502	2.45	0.084	17.4	0.084	17.4
270.7291	7/9/2020	2.471	2.45	0.037	13.1	0.037	13.1
406.0729	7/14/2020	2.74	2.45	3.37	14.4	3.37	14.4
322.8319	7/15/2020	2.424	2.45	0.469	15.5	0.469	15.5
272.5713	7/16/2020	2.401	2.45	0.512	13.1	0.512	13.1
353.5366	7/21/2020	2.455	2.45	0.367	16.9	0.367	16.9
241.0969	7/22/2020	2.375	2.45	0.272	11.9	0.272	11.9
292.5198	7/23/2020	2.333	2.45	0.034	15	0.034	15
307.4391	7/28/2020	2.36	2.45	0.02	15.6	0.02	15.6
366.9522	7/29/2020	2.363	2.45	0.02	18.6	0.02	18.6
316.9285	7/30/2020	2.301	2.45	0.015	16.5	0.015	16.5
311.5149	8/11/2020	2.289	2.295	0.018	16.3	0.018	16.3
353.2698	8/12/2020	2.282	2.295	0.062	18.5	0.062	18.5
280.7905	8/13/2020	2.288	2.295	0.015	14.7	0.015	14.7
297.6251	8/18/2020	2.311	2.295	0.042	15.4	0.042	15.4
348.0862	8/19/2020	2.304	2.295	0.015	18.1	0.015	18.1
259.7369	8/20/2020	2.254	2.295	0.017	13.8	0.017	13.8
301.8338	8/25/2020	2.218	2.295	0.017	16.3	0.017	16.3
281.6131	8/26/2020	2.148	2.295	0.02	15.7	0.02	15.7
318.5832	8/27/2020	2.205	2.295	0.024	17.3	0.024	17.3
260.8882	9/15/2020	2.346	2.37	0.134	13.2	0.134	13.2
316.6846	9/16/2020	2.31	2.37	0.038	16.4	0.038	16.4
276.1888	9/17/2020	2.31	2.37	0.036	14.3	0.036	14.3
309.7876	9/22/2020	2.345	2.37	0.04	15.8	0.04	15.8
374.6401	9/23/2020	2.575	2.37	0.045	17.4	0.045	17.4
306.4746	9/24/2020	2.45	2.37	0.099	14.9	0.099	14.9
183.344	9/28/2020	2.486	2.37	0.043	8.8	0.043	8.8
232.9141	9/29/2020	2.419	2.37	0.045	11.5	0.045	11.5
197.1733	9/30/2020	2.398	2.37	0.059	9.8	0.059	9.8
199.7735	10/6/2020	2.374	2.68	0.29	9.8	0.29	9.8
165.6971	10/7/2020	2.354	2.68	0.24	8.2	0.24	8.2



186.3289	10/8/2020	2.32	2.68	0.53	9.1	0.53	9.1
274.7796	10/11/2020	2.88	2.68	0.04	11.4	0.04	11.4
260.0321	10/12/2020	2.724	2.68	0.046	11.4	0.046	11.4
337.3625	10/27/2020	2.568	2.68	0.052	15.7	0.052	15.7
358.1954	10/28/2020	2.548	2.68	0.056	16.8	0.056	16.8
269.2454	10/29/2020	2.51	2.68	0.062	12.8	0.062	12.8
359.389	11/3/2020	2.883	3.05	0.147	14.8	0.147	14.8
337.7727	11/4/2020	2.924	3.05	0.051	13.8	0.051	13.8
296.9462	11/5/2020	2.981	3.05	0.044	11.9	0.044	11.9
411.4354	11/8/2020	2.731	3.05	0.064	18	0.064	18
444.3234	11/11/2020	2.755	3.05	0.038	19.3	0.038	19.3
376.4131	11/12/2020	2.713	3.05	0.036	16.6	0.036	16.6
313.537	12/8/2020	2.883	3.05	0.14	12.9	0.14	12.9

**ATTACHMENT C**

**REVISED PERMIT ACTION LEVEL ALTERNATIVE 2**

Data, Controls, Numeric Output

significant digits to display

Fix Random number Seed

366 Daily

134,000 Annual

Action Level based on 109 data points Over 1800 days

Please select Data file

WA0020893DAYmp002\_DMR(alt2).csv

Upload complete

Earliest Data to consider for calculation

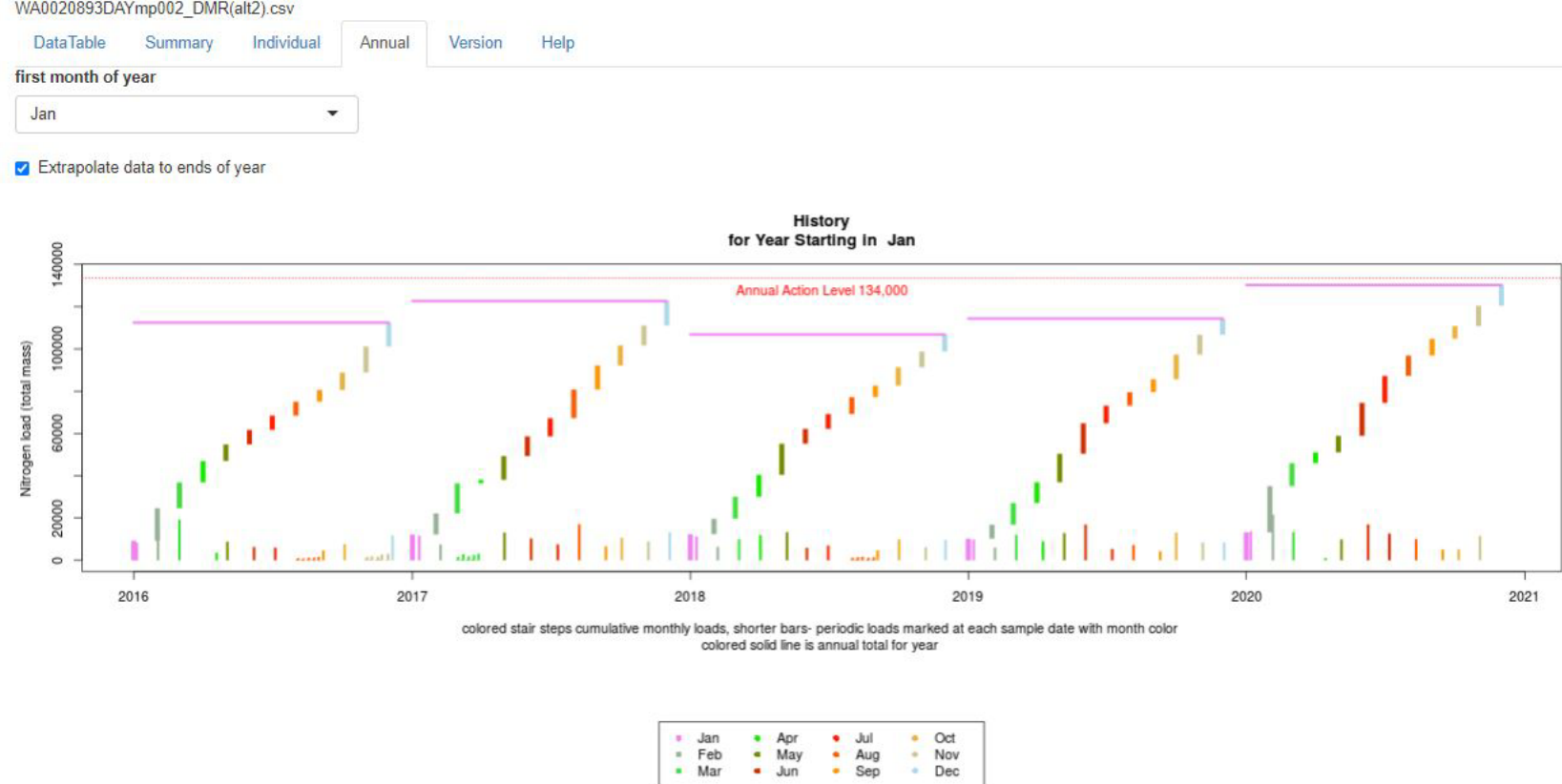
Latest Data to consider for calculation

Samples per month (per year/12)

Thousands of iterations

Confidence Level Needed

If Date is not second field input, data assumed to be sequential months starting in Jan 2015



load	POS	Q2	Qave	AMM	NIT	Ammonia	Nitrate...	Nitrite
297.7915	1/5/2016	2.511	3.12294	0.02	14.2	0.02	14.2	
540.1278	2/2/2016	2.848	2.97866	0.04	22.7	0.04	22.7	
392.5671	3/1/2016	2.92	3.07742	0.02	16.1	0.02	16.1	
256.8628	4/19/2016	2.295	2.43637	0.02	13.4	0.02	13.4	
252.4835	5/3/2016	2.29	2.22839	0.02	13.2	0.02	13.2	
224.8998	6/7/2016	2.12	2.1628	0.02	12.7	0.02	12.7	
214.6773	7/5/2016	2.254	2.09394	0.02	11.4	0.02	11.4	
187.8929	8/2/2016	2.026	2.05555	0.02	11.1	0.02	11.1	
241.3519	8/3/2016	2.073	2.05555	0.06	13.9	0.06	13.9	
202.234	8/4/2016	2.069	2.05555	0.02	11.7	0.02	11.7	
221.8307	8/9/2016	2.078	2.05555	0.4	12.4	0.4	12.4	
221.0961	8/10/2016	2.033	2.05555	0.04	13	0.04	13	
157.1263	8/11/2016	1.979	2.05555	0.02	9.5	0.02	9.5	
167.1816	8/16/2016	2.128	2.05555	0.02	9.4	0.02	9.4	
203.7399	8/17/2016	2.046	2.05555	0.14	11.8	0.14	11.8	
248.2244	8/18/2016	2.033	2.05555	0.24	14.4	0.24	14.4	
173.1119	8/23/2016	2.031	2.05555	0.02	10.2	0.02	10.2	
213.3894	8/24/2016	2.042	2.05555	0.03	12.5	0.03	12.5	
254.9905	8/25/2016	1.97	2.05555	0.02	15.5	0.02	15.5	
205.0439	8/30/2016	2.08	2.05555	0.02	11.8	0.02	11.8	
275.0138	8/31/2016	2.028	2.05555	0.16	16.1	0.16	16.1	
166.9885	9/6/2016	2.21	2.2469	0.02	9.04	0.02	9.04	
274.7339	10/4/2016	2.401	2.80587	0.02	13.7	0.02	13.7	
418.8628	11/1/2016	3.608	3.4292	0.02	13.9	0.02	13.9	
414.3465	11/3/2016	3.082	3.4292	0.02	16.1	0.02	16.1	
337.0239	11/7/2016	2.967	3.4292	0.02	13.6	0.02	13.6	
354.814	11/8/2016	2.777	3.4292	0.02	15.3	0.02	15.3	
323.9503	11/9/2016	2.873	3.4292	0.02	13.5	0.02	13.5	
456.4727	11/15/2016	4.337	3.4292	0.02	12.6	0.02	12.6	
537.7098	11/16/2016	3.68	3.4292	0.02	17.5	0.02	17.5	
576.9969	11/17/2016	3.242	3.4292	0.04	21.3	0.04	21.3	
401.1552	11/20/2016	3.366	3.4292	0.09	14.2	0.09	14.2	
369.1162	11/21/2016	3.019	3.4292	0.06	14.6	0.06	14.6	
391.6544	11/22/2016	3.232	3.4292	0.03	14.5	0.03	14.5	
433.6627	11/29/2016	3.846	3.4292	0.02	13.5	0.02	13.5	
516.5404	11/30/2016	3.915	3.4292	0.02	15.8	0.02	15.8	
337.9131	12/6/2016	3.343	3.18406	0.02	12.1	0.02	12.1	
417.5748	1/10/2017	2.742	2.83858	0.66	17.6	0.66	17.6	
338.3998	2/7/2017	2.936	3.23468	0.02	13.8	0.02	13.8	
473.7123	3/1/2017	3.092	3.55358	0.47	17.9	0.47	17.9	
340.1004	3/2/2017	3.014	3.55358	0.03	13.5	0.03	13.5	
480.41	3/7/2017	3.702	3.55358	0.46	15.1	0.46	15.1	
530.6627	3/8/2017	3.498	3.55358	0.39	17.8	0.39	17.8	
588.8736	3/9/2017	3.586	3.55358	0.19	19.5	0.19	19.5	

348.3535	3/14/2017	3.825	3.55358	0.02	10.9	0.02	10.9
414.1466	3/15/2017	4.379	3.55358	0.04	11.3	0.04	11.3
387.1395	3/16/2017	3.83	3.55358	0.02	12.1	0.02	12.1
440.5084	3/21/2017	3.375	3.55358	0.15	15.5	0.15	15.5
469.8085	3/22/2017	3.188	3.55358	0.77	16.9	0.77	16.9
523.2519	3/23/2017	3.077	3.55358	0.49	19.9	0.49	19.9
286.2185	3/28/2017	3.358	3.55358	0.02	10.2	0.02	10.2
529.6879	3/29/2017	4.002	3.55358	0.17	15.7	0.17	15.7
1.299789	4/4/2017	3.117	3.26913	0.04	0.01	0.04	0.01
375.9532	5/2/2017	2.828	2.92835	0.04	15.9	0.04	15.9
296.5849	6/6/2017	2.473	2.41167	0.08	14.3	0.08	14.3
268.4092	7/11/2017	2.453	2.21252	0.02	13.1	0.02	13.1
488.1502	8/8/2017	2.08	2.08839	1.84	26.3	1.84	26.3
317.5288	9/12/2017	2.058	2.09257	0.1	18.4	0.1	18.4
303.6978	10/3/2017	2.055	2.291	0.02	17.7	0.02	17.7
317.7633	11/7/2017	2.368	2.999	1.19	14.9	1.19	14.9
380.3749	12/5/2017	2.905	3.134	0.1	15.6	0.1	15.6
405.1618	1/9/2018	4.357	3.624	0.75	10.4	0.75	10.4
228.4586	2/6/2018	4.476	3.74	0.02	6.1	0.02	6.1
358.1108	3/6/2018	2.838	3.08394	1.43	13.7	1.43	13.7
343.4712	4/3/2018	2.98	3.5245	0.12	13.7	0.12	13.7
515.0542	5/8/2018	2.67	2.55	0.13	23	0.13	23
212.474	6/3/2018	2.51	2.47	0.05	10.1	0.05	10.1
226.1618	7/1/2018	2.532	2.2261	0.41	10.3	0.41	10.3
204.3296	8/1/2018	2.177	2.15	0.454	10.8	0.454	10.8
257.9629	8/2/2018	2.12	2.15	1.69	12.9	1.69	12.9
230.2113	8/7/2018	2.156	2.15	0.303	12.5	0.303	12.5
331.1407	8/8/2018	2.121	2.15	4.22	14.5	4.22	14.5
288.8736	8/9/2018	2.209	2.15	1.48	14.2	1.48	14.2
140.7647	8/14/2018	2.017	2.15	0.268	8.1	0.268	8.1
281.3332	8/15/2018	2.212	2.15	4.15	11.1	4.15	11.1
280.6418	8/21/2018	2.178	2.15	3.05	12.4	3.05	12.4
225.3171	8/22/2018	2.134	2.15	1.46	11.2	1.46	11.2
238.2084	8/23/2018	2.046	2.15	1.96	12	1.96	12
201.9661	8/28/2018	2.168	2.15	1.07	10.1	1.07	10.1
192.4609	8/29/2018	2.05	2.15	0.857	10.4	0.857	10.4
285.5566	8/30/2018	2.026	2.15	5.6	11.3	5.6	11.3
171.2169	9/4/2018	2.184	2.37	0.37	9.03	0.37	9.03
284.6178	10/2/2018	2.564	2.46	4.66	8.65	4.66	8.65
238.7358	11/6/2018	3.078	2.954	0.36	8.94	0.36	8.94
261.2013	12/2/2018	3.026	2.94	1.53	8.82	1.53	8.82
351.5373	1/8/2019	3.225	2.88	1.27	11.8	1.27	11.8
215.8686	2/5/2019	2.652	2.93	1.52	8.24	1.52	8.24
347.3587	3/5/2019	2.506	2.68	4.52	12.1	4.52	12.1
321.0837	4/9/2019	2.553	2.76	0.28	14.8	0.28	14.8

460.5919	5/7/2019	2.471	2.47	1.65	20.7	1.65	20.7
483.9135	6/4/2019	2.32	2.35	1.01	24	1.01	24
193.9255	7/9/2019	2.157	2.17	0.98	9.8	0.98	9.8
207.7974	8/6/2019	2.085	2.12	1.25	10.7	1.25	10.7
204.1065	9/10/2019	2.36	2.441	1.11	9.26	1.11	9.26
374.4909	10/1/2019	2.391	2.58	1.08	17.7	1.08	17.7
303.4225	11/5/2019	2.232	2.52	0.3	16	0.3	16
242.6564	12/3/2019	2.311	2.94	0.09	12.5	0.09	12.5
472.0601	1/7/2020	3.531	3.42	0.13	15.9	0.13	15.9
797.7063	2/5/2020	6.911	3.64	0.04	13.8	0.04	13.8
319.8974	3/3/2020	3.17	2.83	0.1	12	0.1	12
53.50469	4/14/2020	2.477	2.6	2.22	0.37	2.22	0.37
283.2652	5/5/2020	2.715	2.72	0.31	12.2	0.31	12.2
606.3092	6/9/2020	3.306	3.035	12.9	9.09	12.9	9.09
363.0696	7/7/2020	2.579	2.45	0.08	16.8	0.08	16.8
286.7357	8/11/2020	2.289	2.295	0.02	15	0.02	15
243.2009	9/15/2020	2.346	2.37	0.13	12.3	0.13	12.3
185.1221	10/6/2020	2.374	2.68	0.29	9.06	0.29	9.06
330.608	11/3/2020	2.883	3.05	0.15	13.6	0.15	13.6
313.537	12/8/2020	2.883	3.05	0.14	12.9	0.14	12.9