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STATE OF CALIFORNIA
WATER RESOURCES CONTROL BOARD
DIVISION OF DRINKING WATER

TO: City of Los Angeles Department of Water and Power
Box 51111, Room 1455
Los Angeles, CA 90051

Attn: Mr. Martin L. Adams
Senior Assistant General Manager, Water System

CITATION FOR VIOLATION OF CALIFORNIA CODE OF REGULATIONS, TITLE
22, SECTION 64655

WATER SYSTEM NO. 1910067

CITATION NO. 04_15_16C_002_1910067_38

Issued on June 16, 2016

Section 116650 of the California Health and Safety Code authorizes the issuance of a citation to a public water system for violation of the California Safe Drinking Water Act (Health and Safety Code, Division 104, Part 12, Chapter 4, commencing with Section 116270) (hereinafter "California SDWA"), or any regulation, standard, permit or order issued or adopted thereunder.

1 The State Water Resources Control Board, acting by and through its Division of
2 Drinking Water (hereinafter "Division") and the Deputy Director for the Division
3 (hereinafter "Deputy Director"), hereby issues a Citation to the City of Los Angeles
4 Department of Water and Power (hereinafter "LADWP") (mailing address: Box 51111,
5 Room 1455, Los Angeles, CA, 90051), for failure to comply with Section 64655 of
6 Title 22, California Code of Regulations (CCR).

7
8 **APPLICABLE AUTHORITIES**

9
10 **Section 116650 of California Health and Safety Code provides:**

11
12 **116650. Citations**

13
14 (a) If the department determines that a public water system is in violation of this
15 chapter or any regulation, permit, standard, citation, or order issued or adopted
16 thereunder, the department may issue a citation to the public water system.
17 The citation shall be served upon the public water system personally or by
18 certified mail. Service shall be deemed effective as of the date of personal
19 service or the date of receipt of the certified mail. If a person to whom a citation
20 is directed refuses to accept delivery of the certified mail, the date of service
21 shall be deemed to be the date of mailing.

- 1 (b) Each citation shall be in writing and shall describe the nature of the violation or
2 violations, including a reference to the statutory provision, standard, order,
3 citation, permit, or regulation alleged to have been violated.
- 4 (c) A citation may specify a date for elimination or correction of the condition
5 constituting the violation.
- 6 (d) A citation may include the assessment of a penalty as specified in subdivision (e).
- 7 (e) The department may assess a penalty in an amount not to exceed one thousand
8 dollars (\$1,000) per day for each day that a violation occurred, and for each day
9 that a violation continues to occur. A separate penalty may be assessed for
10 each violation.

11

12 **Title 22, California Code of Regulations, Chapter 17 Surface Water Treatment,**
13 **Article 3 Monitoring Requirements, Section 64655 states in relevant part:**

14

15 **64655. Filtration Monitoring**

16

17 *(a) To determine compliance with the performance standards specified in section*
18 *64653 and the operating criteria in section 64660, a supplier shall conduct turbidity*
19 *monitoring in accordance with table 64655. Monitoring shall be conducted when the*
20 *treatment plant is in operation and pursuant to the operations plan required by section*
21 *64661.*

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Table 64655

Filtered Water Turbidity Monitoring

If a supplier uses...	Turbidity monitoring shall be conducted of...	And the turbidity level shall be recorded...
<i>(1) Conventional or direct filtration treatment and serves 10,000 or more persons</i>	<i>(A) Each individual filter, continuously; and</i>	<i>At least once every 15 minutes</i>
	<i>(B) The combined filter effluent^(b), continuously</i>	<i>At least once every 15 minutes</i>

(c) If there is an interruption in continuous turbidity monitoring due to equipment failure or maintenance, a supplier that uses conventional or direct filtration treatment shall conduct grab sample monitoring once every four hours in lieu of continuous monitoring until the continuous turbidimeter is back on-line. From the time of equipment failure or maintenance interruption, continuous monitoring shall be reinitiated:

(1) For a supplier serving 10,000 or more persons, within 48 hours for the combined filter effluent and within five working days for the individual filter effluent.

STATEMENT OF FACTS

LADWP is a community water system that serves approximately 3.9 million people through 690,547 service connections. It is operated under Water Supply Permit No. 04-15-08P-003, issued on May 1, 2008, and subsequent permit amendments.

1 The Los Angeles Aqueduct Filtration Plant (LAAFP) is a 600-million gallon per day
2 (MGD) plant that treats surface water from the Los Angeles Aqueduct and the State
3 Water Project. The treatment processes include pre-ozonation, rapid mix and
4 coagulation, high-rate flocculation, high-rate filtration, chlorine and ultraviolet
5 disinfection, and fluoridation. Since the LAAFP does not include a sedimentation
6 process, it is classified as a direct filtration plant. The LAAFP is divided into two
7 modules with two treatment trains per module. Each treatment train contains one
8 ozone contactor, two rapid mixers, nine flocculators, and six double filters. After
9 filtration, the combined effluent receives ultraviolet disinfection and chlorine
10 disinfection. Ammonia is then added to form a chloramine residual before entering the
11 distribution system.

12
13 In accordance with the Interim Enhanced Surface Water Treatment Rule (IESWTR),
14 the LAAFP has turbidimeters installed at the effluent of each individual filter to
15 continuously report turbidity measurements and record them every 15 minutes. The
16 continuous readings from all turbidimeters are monitored in the LAAFP control room
17 by a Water Treatment Operator (WTO). In addition, a WTO is expected to walk
18 through the LAAFP unit processes once per eight-hour shift and verify that all
19 monitoring equipment, including the turbidimeters, is operating properly.

20
21 Friday, March 4, 2016, approximately 00:15

22 The LAAFP filter effluent turbidimeter for Module #2, Filter #12 failed. It began displaying
23 “-0.00 NTU” for the turbidity value, as shown in Attachment A. The LAAFP Control Room

1 Operator (CRO) did not note any audible or visual alarms at the time on the Distributed
2 Control System (DCS). There are no written records from the WTO walk-through during
3 this shift.
4

5 Friday, March 4, 2016, approximately 13:15

6 During the routine plant walk-through, the WTO noticed an alarm signal on the
7 turbidimeter display in the LAAFP filter gallery and notified the CRO of the issue. At that
8 point, the CRO directed the same WTO to collect and analyze a grab sample in
9 accordance with Standard Operating Procedures and Surface Water Treatment Rule
10 (SWTR) regulations. The grab sample was 0.073 NTU. In addition, the CRO contacted
11 the LADWP Instrument Shop to make repairs. These were completed at approximately
12 15:00 hours and consisted of replacing a burnt-out lightbulb within the turbidimeter.
13

14 Friday, March 4, 2016, approximately 15:30

15 The CRO contacted the LAAFP Chief Plant Operator (CPO) at home and informed him of
16 the turbidimeter alarm and repair. The CPO instructed the CRO to trend the turbidimeter
17 value to determine when the bulb had failed. The CRO erroneously stated that the bulb
18 had failed 12:15 PM (not AM), and with that information, the CPO determined that one
19 grab sample taken during the continuous turbidimeter outage was sufficient to meet the
20 SWTR individual filter monitoring requirements.
21
22
23

1 Friday, April 8, 2016, 18:54

2 The LAAFP Associate Engineer (AE) was finalizing the LAAFP Monthly Report for March
3 2016 and discovered that only one turbidity grab sample had been taken over the
4 approximately 15-hour outage of the continuous turbidimeter. The AE notified the LAAFP
5 CPO and the Division by email immediately. The email and March 2016 LAAFP SWTR
6 report are shown in Attachment B.

7
8 Friday, April 29, 2016

9 At the request of the Division, LADWP completed an investigation and submitted an
10 incident report regarding the turbidimeter failure and subsequent actions. The incident
11 report is shown in Attachment C. During the investigation, it was discovered that the
12 "low turbidity" alarm for the turbidimeter on Module #2, Filter #12 had been changed
13 to a negative number in September 2015. Because the turbidimeter does not read or
14 display negative numbers, the low turbidity alarm was not triggered by the -0.00 NTU
15 reading during the bulb failure; therefore, the CRO was not alerted to the problem via the
16 DCS. The investigation confirmed that all other LAAFP turbidimeter alarms are correctly
17 set for 0.01 NTU, and a standardized list of turbidity alarm setpoints was generated, as
18 shown in Attachment D. LADWP interviewed the WTO responsible for changing the
19 turbidimeter low alarm setting, and he claimed it was an error.

20

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1 Treated Water Evaluation and Investigation

2 LADWP performed an analysis of the available data during the Module #2, Filter #12
3 turbidimeter failure and reported the following findings in the incident report
4 (Attachment C):

- 5 1. Influent water quality and quantity were stable for the duration of the turbidimeter
6 outage. Operators did not note any significant changes in the treatability of the
7 water during this time period.
- 8 2. Chemical use and residuals were stable, again indicating consistent water quality
9 and treatability.
- 10 3. Flows, backwash frequency, and headloss for Filter #12 closely mimic those of the
11 other filters on that train, indicating no significant differences in either influent
12 water quality or filter performance during this time period.
- 13 4. UV disinfection trends show a *Cryptosporidium* and *Giardia* inactivation of not less
14 than 1.5 log and 2.0 log, respectively, during this time period.
- 15 5. Turbidity readings for the remaining filters on Module #2, combined turbidity
16 readings for Train #3, and a simplified mass-balance calculation indicate that Filter
17 #12's turbidity during this period did not exceed 0.30 NTU. This indicates the filter
18 performance parameters were met for *Cryptosporidium*, *Giardia*, and virus removal
19 on that filter.
- 20 6. The multiple barrier approach utilized at LAAFP, including filter operations, UV
21 disinfection and chlorine disinfection, provided an effective barrier against
22 pathogens during the continuous turbidimeter instrument failure

23

1 **DETERMINATION**

2
3 The Division has determined that LADWP is in violation of Section 64655(c) of Title
4 22, California Code of Regulations due to the failure to conduct grab sample
5 monitoring once every four hours in lieu of continuous individual filter turbidity
6 monitoring until the continuous turbidimeter was back online.

7
8 **DIRECTIVES**

9
10 LADWP is hereby directed to take the following actions:

- 11 1. Because of the failure to conduct grab sample monitoring once every four
12 hours in lieu of continuous individual filter turbidity monitoring until the
13 continuous turbidimeter was back online, Section 64463.7, Title 22, CCR,
14 regarding Tier 3 Public Notice, will be utilized for the failure to meet the
15 Surface Water Treatment Rule, as instructed in Section 64666(d). By **April**
16 **7, 2017**, LADWP shall provide Tier 3 public notification by mail or direct
17 delivery to customers served. The notice shall include all mandatory
18 language specified by the regulation. Notice shall be provided to all
19 customers that receive a bill, including those that provide their drinking
20 water to others (e.g., schools or school systems, apartment building
21 owners, or large private employers), and other service connections to which
22 water is delivered by the water system. In addition, LADWP shall use one or
23 more of the following methods to reach persons not likely to be reached by
24 the a mailing or direct delivery (renters, university students, nursing home

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patients, prison inmates, etc.): (1) publication in a local newspaper or newsletter distributed to customers; (2) e-mail message to employees or students; (3) posting on the Internet or intranet; or (4) direct delivery to each customer.

2. Within 10 days of providing Tier 3 notification, LADWP shall provide proof of notification by submittal of the necessary form (Attachment E) with a copy of the distributed notice to the Division. The certification of notification must identify the number of notices posted, the locations where the notices were posted, and how long the notices were posted.

3. LADWP shall modify the instrumentation for all critical water quality parameters, including but not limited to turbidimeters, chlorine residual analyzers, and UV reactor setpoints, to ensure that alarm settings can only be changed by the order of the LAAFP Chief Plant Operator or other authorized supervisory personnel. The LAAFP Operations, Maintenance, and Monitoring Plan (OMMP) shall be updated with this information, and Section 25, Plant Alarms, of the OMMP shall be updated with the turbidity alarm setpoints shown in Attachment D. The updated LAAFP OMMP shall be submitted to the Division by **September 1, 2016**.

4. Effective immediately, a certified water treatment operator shall perform a physical walkthrough of all LAAFP unit processes at least once per shift and shall record the findings in the worksheet shown in Attachment F. This procedure shall be documented in the updated LAAFP OMMP and submitted to the Division by **September 1, 2016**.

1 The Division reserves the right to make such modifications to this Citation as it may
2 deem necessary to protect public health and safety. Such modifications may be
3 issued as amendments to this Citation, and shall be deemed effective upon issuance.

4
5 Nothing in this Citation relieves LADWP of its obligation to meet the requirements of
6 the California Safe Drinking Water Act, or of any regulation, permit, standard, or order
7 issued or adopted thereunder.

8
9 All submittals required by this Citation shall be submitted to the Division at the
10 following address:

11 Chi Diep
12 District Engineer
13 State Water Resources Control Board
14 Division of Drinking Water
15 500 North Central Avenue, Suite 500
16 Glendale, CA 91203
17

18 **PARTIES BOUND**

19 This Citation shall apply to and be binding upon LADWP, its officers, directors,
20 shareholders, agents, employees, contractors, successors, and assignees.

21
22 **SEVERABILITY**

23 The Directives of this Citation are severable, and LADWP shall comply with each and
24 every provision thereof, notwithstanding the effectiveness of any other provision.

25

1 **FURTHER ENFORCEMENT ACTION**

2 The California SDWA authorizes the Division to: issue citation with assessment of
3 administrative penalties to a public water system for violation or continued violation of
4 the requirements of the California SDWA or any permit, regulation, permit or order
5 issued or adopted thereunder including, but not limited to, failure to correct a violation
6 identified in a citation or compliance order. The California SDWA also authorizes the
7 Division to take action to suspend or revoke a permit that has been issued to a public
8 water system if the system has violated applicable law or regulations or has failed to
9 comply with an order of the Division; and to petition the superior court to take various
10 enforcement measures against a public water system that has failed to comply with
11 an order of the Division. The Division does not waive any further enforcement action
12 by issuance of this citation.

13
14
15 June 16, 2016

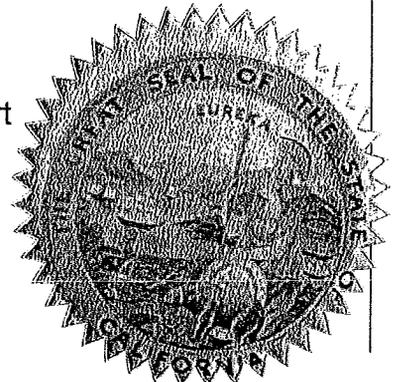
16 Date



Chi Diep, P.E.
District Engineer
Division of Drinking Water
State Water Resources Control Board

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20 **Attachments:**

- 21 A: LAAFP Module #2, Filter #12 trend data for March 4, 2016
- 22 B: Email and LADWP March 2016 LAAFP SWTR Monthly Report
- 23 C: LADWP Incident Report
- 24 D: LAAFP Turbidity Alarm Setpoints, April 2016



1 E: Form for Proof of Tier 3 Notification

2 F: Turbidimeter Recording Worksheet

3

4 By Certified Mail No. 7014 2870 0001 2130 1373

ATTACHMENT A

LAAFP Module #2, Filter #12 Trend Data
for March 4, 2016

Historical Trend Display

File Create Page Zoom Shift

Select Abort Status

Modify Properties

Tab

Start Time: 03/03/16 21:59:00 PST

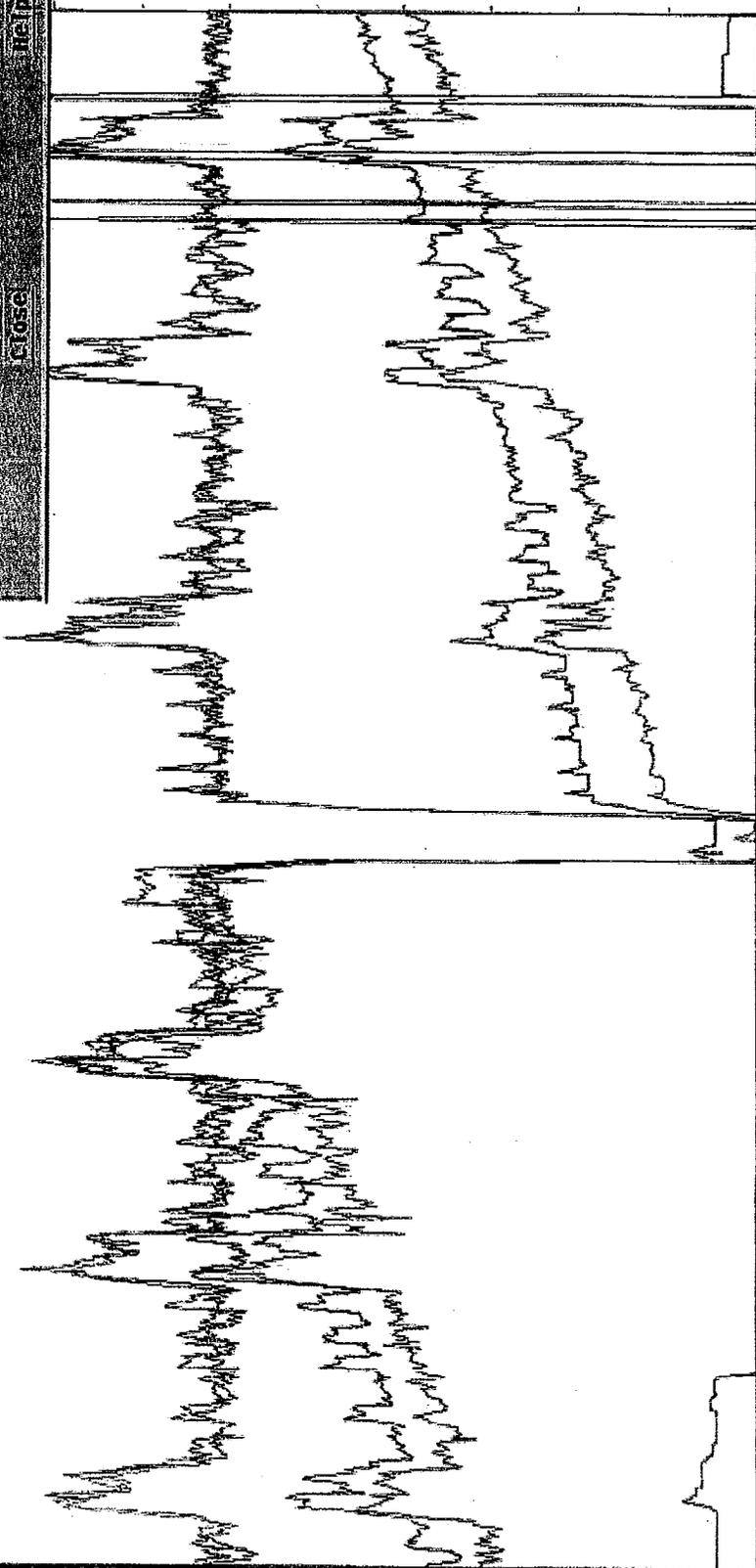
End Time: 03/04/16 15:58:59 PST

- A AIT3413C
- A FIT3405C
- A FIT3406C
- A PDIT3411C
- A PDIT3412C

- Mod2 Fil 12 Effluent Turbidity 100%G NTU
- Mod 2 Filter 12A Effluent Flow 100%G MGD
- Mod 2 Filter 12B Effluent Flow 100%G MGD
- Mod2 Fil 12A Head Loss Diff Pr 100%G FT
- Mod2 Fil 12B Head Loss Diff Pr 100%G FT

Values

Point Name	Actual Value
AIT3413C	-0.00
FIT3405C	10.5
FIT3406C	9.9
PDIT3411C	4.9
PDIT3412C	3.9



1 Tick = 1.0 Hours

Retrieval is complete

info
 FIELD
 PLANT
 UNIT

15-Apr-2016
 11:07:24
 drop211
 UNIT12A2

Historical Trend Display

File Create Page Zoom Shift

Select Abort Status Modify Properties...

Start Time: 03/03/16 12:59:00 PST
End Time: 03/04/16 15:58:59 PST

- A AIT3413C
- A FIT3405C
- A FIT3406C
- A PDIT3411C
- A PDIT3412C

- Mod2 Fil 12 Effluent Turbidity 100%G
- Mod 2 Filter 12A Effluent Flow 100%G
- Mod 2 Filter 12B Effluent Flow 100%G
- Mod2 Fil 12A Head Loss Diff Pr 100%G
- Mod2 Fil 12B Head Loss Diff Pr 100%G

- MTC
- MCD
- MCD
- FI
- FI

Time Value Display 1

Date: 03/03/16
Time: 14:28:05
Point Name

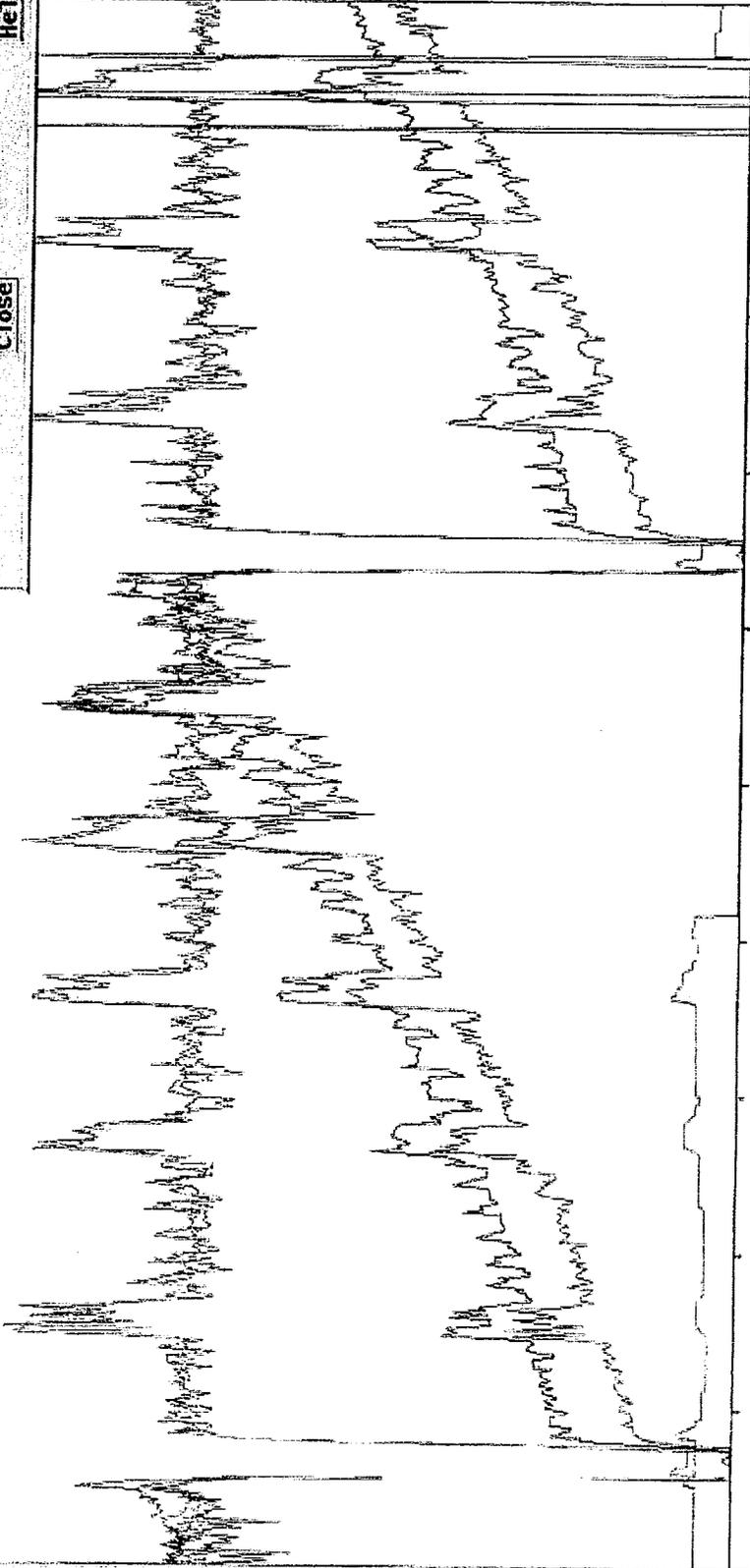
Actual Value	0.10
Actual Value	8.6
Actual Value	8.6
Actual Value	5.6
Actual Value	5.2

AIT3413C
FIT3405C
FIT3406C
PDIT3411C
PDIT3412C

Values

Close

Help



9.00
8.00
7.00
6.00
5.00

1 Tick = 2.7 Hours

Retrieval is complete

19-Apr-2016 11:10:53 drop211 INIT12M3

PLANT FIELD info

Date	Time	(1) NTU		(2) MGD		(3) MGD		(4) FT		(5) FT	
		ACTUAL VAL	NTU	ACTUAL VAL	MGD	ACTUAL VAL	MGD	ACTUAL VAL	FT	ACTUAL VAL	FT
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03/03/16	15:24:48 PST	0.08	10.4	9.8	2.0	1.1	1.1				
03/03/16	15:27:30 PST	0.07	10.3	10.2	2.0	1.1	1.2				
03/03/16	15:30:12 PST	0.07	10.0	9.6	2.0	1.1	1.1				
03/03/16	15:32:54 PST	0.06	10.2	9.7	2.0	1.1	1.1				
03/03/16	15:35:36 PST	0.06	9.4	9.8	1.9	1.1	1.1				
03/03/16	15:38:18 PST	0.06	9.4	9.8	1.8	1.1	1.1				
03/03/16	15:41:00 PST	0.06	10.0	10.1	2.1	1.1	1.3				
03/03/16	15:43:42 PST	0.06	10.0	9.9	2.1	1.2	1.2				
03/03/16	15:46:24 PST	0.06	10.1	10.2	2.0	1.1	1.2				
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03/03/16	16:37:42 PST	0.05	10.4	9.9	2.3	1.4	1.4				
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03/03/16	16:43:06 PST	0.05	10.0	9.9	2.3	1.4	1.4				
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03/03/16	17:20:54 PST	0.07	12.6	12.1	3.1	2.5	2.5				
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03/03/16	17:31:42 PST	0.07	9.8	9.9	2.3	1.7	1.7				
03/03/16	17:34:24 PST	0.07	9.4	10.3	2.2	1.7	1.7				
03/03/16	17:37:06 PST	0.07	9.6	10.1	2.3	1.6	1.6				
03/03/16	17:39:48 PST	0.06	9.8	9.8	2.3	1.6	1.6				
03/03/16	17:42:30 PST	0.06	9.9	9.7	2.4	1.6	1.6				
03/03/16	17:45:12 PST	0.06	9.5	9.7	2.3	1.9	1.9				
03/03/16	17:47:54 PST	0.06	11.0	10.3	2.8	1.6	1.6				
03/03/16	17:50:36 PST	0.06	10.4	9.9	2.6	2.5	2.5				
03/03/16	17:53:18 PST	0.06	10.3	9.8	2.5	1.8	1.8				

Date	Time	(1) NTU		(2) MGD		(3) MGD		(4) FT		(5) FT	
		ACTUAL VAL	MGD	ACTUAL VAL	MGD	ACTUAL VAL	MGD	ACTUAL VAL	FT	ACTUAL VAL	FT
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03/03/16	18:01:24 PST	112	0.06	9.0	9.7	9.7	2.3	2.3	1.7		
03/03/16	18:04:06 PST	113	0.06	9.5	9.9	9.9	2.4	2.4	1.7		
03/03/16	18:06:48 PST	114	0.06	9.4	9.9	9.9	2.3	2.3	1.6		
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03/03/16	18:12:12 PST	116	0.06	10.1	9.4	9.4	2.6	2.6	1.7		
03/03/16	18:14:54 PST	117	0.06	10.0	9.9	9.9	2.7	2.7	1.8		
03/03/16	18:17:36 PST	118	0.06	10.2	9.7	9.7	2.7	2.7	1.7		
03/03/16	18:20:18 PST	119	0.06	9.3	9.7	9.7	2.4	2.4	1.7		
03/03/16	18:23:00 PST	120	0.06	9.4	9.7	9.7	2.5	2.5	1.7		
03/03/16	18:25:42 PST	121	0.06	9.4	9.8	9.8	2.4	2.4	1.8		
03/03/16	18:28:24 PST	122	0.06	9.7	9.8	9.8	2.5	2.5	1.8		
03/03/16	18:31:06 PST	123	0.06	9.5	9.5	9.5	2.5	2.5	1.6		
03/03/16	18:33:48 PST	124	0.06	9.6	10.1	10.1	2.5	2.5	2.0		
03/03/16	18:36:30 PST	125	0.06	10.5	9.7	9.7	2.9	2.9	1.9		
03/03/16	18:39:12 PST	126	0.06	10.3	9.8	9.8	2.8	2.8	1.9		
03/03/16	18:41:54 PST	127	0.06	9.9	9.6	9.6	2.7	2.7	1.8		
03/03/16	18:44:36 PST	128	0.06	9.6	9.9	9.9	2.6	2.6	1.9		
03/03/16	18:47:18 PST	129	0.06	9.5	9.8	9.8	2.6	2.6	1.9		
03/03/16	18:50:00 PST	130	0.06	9.6	9.8	9.8	2.6	2.6	1.8		
03/03/16	18:52:42 PST	131	0.06	9.6	9.8	9.8	2.6	2.6	2.0		
03/03/16	18:55:24 PST	132	0.06	9.5	9.6	9.6	2.6	2.6	2.0		
03/03/16	18:58:06 PST	133	0.06	9.6	9.9	9.9	2.6	2.6	1.9		
03/03/16	19:00:48 PST	134	0.06	9.5	9.6	9.6	2.6	2.6	1.9		
03/03/16	19:03:30 PST	135	0.06	10.7	10.0	10.0	3.0	3.0	1.9		
03/03/16	19:06:12 PST	136	0.06	10.1	9.4	9.4	2.8	2.8	1.9		
03/03/16	19:08:54 PST	137	0.06	10.4	9.8	9.8	2.9	2.9	2.0		
03/03/16	19:11:36 PST	138	0.07	9.4	9.9	9.9	2.6	2.6	2.0		
03/03/16	19:14:18 PST	139	0.07	9.3	9.2	9.2	2.6	2.6	1.8		
03/03/16	19:17:00 PST	140	0.07	9.8	9.4	9.4	2.7	2.7	1.8		
03/03/16	19:19:42 PST	141	0.07	9.7	10.0	10.0	2.7	2.7	2.1		
03/03/16	19:22:24 PST	142	0.07	9.7	10.2	10.2	2.7	2.7	2.2		
03/03/16	19:25:06 PST	143	0.07	9.8	10.0	10.0	2.7	2.7	2.2		
03/03/16	19:27:48 PST	144	0.07	9.8	9.9	9.9	2.8	2.8	2.2		
03/03/16	19:30:30 PST	145	0.07	9.8	10.2	10.2	3.2	3.2	2.2		
03/03/16	19:33:12 PST	146	0.07	10.7	10.0	10.0	3.0	3.0	2.1		
03/03/16	19:35:54 PST	147	0.07	9.9	10.0	10.0	3.0	3.0	2.1		
03/03/16	19:38:36 PST	148	0.07	9.5	9.4	9.4	2.8	2.8	2.0		
03/03/16	19:41:18 PST	149	0.07	9.6	9.5	9.5	2.8	2.8	2.0		
03/03/16	19:44:00 PST	150	0.07	9.7	9.6	9.6	2.8	2.8	2.0		
03/03/16	19:46:42 PST	151	0.07	9.4	10.3	10.3	2.8	2.8	2.4		
03/03/16	19:49:24 PST	152	0.07	9.4	10.4	10.4	2.8	2.8	2.4		
03/03/16	19:52:06 PST	153	0.07	10.3	10.2	10.2	3.3	3.3	2.4		
03/03/16	19:54:48 PST	154	0.07	10.3	10.2	10.2	3.3	3.3	2.3		
03/03/16	19:57:30 PST	155	0.07	10.1	10.3	10.3	3.0	3.0	2.4		
03/03/16	20:00:12 PST	156	0.07	10.1	9.8	9.8	3.1	3.1	2.3		
03/03/16	20:02:54 PST	157	0.07	10.6	11.3	11.3	3.3	3.3	2.3		
03/03/16	20:05:36 PST	158	0.07	11.8	10.3	10.3	3.8	3.8	2.9		
03/03/16	20:08:18 PST	159	0.08	12.3	12.7	12.7	4.1	4.1	2.4		
03/03/16	20:11:00 PST	160	0.08	11.9	12.1	12.1	3.7	3.7	3.4		
03/03/16	20:13:42 PST	161	0.11	11.9	12.6	12.6	3.8	3.8	3.1		
03/03/16	20:16:24 PST	162	0.11	11.6	11.8	11.8	3.7	3.7	3.3		
03/03/16	20:19:06 PST	163	0.11	11.6	11.5	11.5	3.7	3.7	3.1		
03/03/16	20:21:48 PST	164	0.11	11.6	11.6	11.6	3.7	3.7	3.0		
03/03/16	20:24:30 PST	165	0.11	11.8	12.0	12.0	3.8	3.8	3.0		
03/03/16	20:27:12 PST	166	0.11	11.8	11.3	11.3	3.9	3.9	3.2		
03/03/16	20:29:54 PST	167	0.11	11.7	11.5	11.5	3.8	3.8	3.2		
03/03/16	20:32:36 PST		0.11	11.3	11.5	11.5	3.8	3.8	3.0		

Date	Time	(1) NFU		(2) MGD		(3) MGD		(4) FT		(5) FT	
		ACTUAL VAL									
03/03/16	20:32:36 PST	0.11	11.1	10.0	10.0	3.7	2.4				
03/03/16	20:35:18 PST	0.11	10.0	9.8	9.8	3.3	2.3				
03/03/16	20:38:00 PST	0.11	10.3	10.1	10.1	3.3	2.5				
03/03/16	20:40:42 PST	0.10	10.3	9.9	10.1	3.4	2.6				
03/03/16	20:43:24 PST	0.10	9.9	9.8	9.9	3.3	2.5				
03/03/16	20:46:06 PST	0.08	9.9	9.9	9.8	3.3	2.6				
03/03/16	20:48:48 PST	0.08	9.1	9.9	2.8	2.8	2.6				
03/03/16	20:51:30 PST	0.08	9.4	9.9	3.0	3.0	2.5				
03/03/16	20:54:12 PST	0.08	9.3	9.8	3.0	2.6	2.5				
03/03/16	20:56:54 PST	0.08	9.1	9.8	3.5	2.5	2.5				
03/03/16	20:59:36 PST	0.07	10.0	9.6	3.4	2.7	2.7				
03/03/16	21:02:18 PST	0.07	10.0	9.7	3.4	2.7	2.6				
03/03/16	21:05:00 PST	0.07	10.3	9.8	3.5	2.6	2.6				
03/03/16	21:07:42 PST	0.08	10.2	10.0	3.4	2.7	2.7				
03/03/16	21:10:24 PST	0.08	10.2	10.1	3.4	2.7	2.7				
03/03/16	21:13:06 PST	0.08	10.1	9.9	3.5	2.5	2.5				
03/03/16	21:15:48 PST	0.08	10.1	9.5	3.4	2.6	2.6				
03/03/16	21:18:30 PST	0.08	10.0	9.5	3.5	2.5	2.5				
03/03/16	21:21:12 PST	0.08	10.0	9.8	3.0	2.8	2.8				
03/03/16	21:23:54 PST	0.08	8.9	10.1	3.2	2.8	2.8				
03/03/16	21:26:36 PST	0.08	9.2	9.9	3.2	2.6	2.6				
03/03/16	21:29:18 PST	0.08	9.3	9.9	3.2	2.9	2.9				
03/03/16	21:32:00 PST	0.08	10.6	9.5	3.6	2.9	2.9				
03/03/16	21:34:42 PST	0.08	10.1	9.8	3.6	2.7	2.7				
03/03/16	21:37:24 PST	0.08	10.1	9.7	3.6	2.9	2.9				
03/03/16	21:40:06 PST	0.08	9.9	9.9	3.6	2.9	2.9				
03/03/16	21:42:48 PST	0.08	10.1	9.9	3.6	2.7	2.7				
03/03/16	21:45:30 PST	0.08	10.0	9.7	3.6	2.9	2.9				
03/03/16	21:48:12 PST	0.08	9.8	9.8	3.5	2.8	2.8				
03/03/16	21:50:54 PST	0.08	10.0	9.8	3.7	2.8	2.8				
03/03/16	21:53:36 PST	0.08	10.0	9.6	3.7	2.9	2.9				
03/03/16	21:56:18 PST	0.08	10.0	9.7	3.7	3.1	3.1				
03/03/16	21:59:00 PST	0.08	10.0	10.2	3.7	3.0	3.0				
03/03/16	22:01:42 PST	0.08	9.3	9.9	3.3	2.9	2.9				
03/03/16	22:04:24 PST	0.08	9.3	9.5	3.4	3.1	3.1				
03/03/16	22:07:06 PST	0.08	9.2	9.9	3.4	2.9	2.9				
03/03/16	22:09:48 PST	0.08	10.2	10.1	3.4	3.1	3.1				
03/03/16	22:12:30 PST	0.08	10.2	10.1	3.8	3.2	3.2				
03/03/16	22:15:12 PST	0.08	10.2	9.8	3.8	3.2	3.2				
03/03/16	22:17:54 PST	0.08	10.1	9.6	3.8	2.9	2.9				
03/03/16	22:20:36 PST	0.08	9.8	9.6	3.7	3.0	3.0				
03/03/16	22:23:18 PST	0.08	9.6	9.4	3.7	2.9	2.9				
03/03/16	22:26:00 PST	0.08	9.6	9.4	3.8	2.9	2.9				
03/03/16	22:28:42 PST	0.08	9.9	9.5	3.2	3.2	3.2				
03/03/16	22:31:24 PST	0.08	10.0	9.9	3.9	3.8	3.8				
03/03/16	22:34:06 PST	0.08	10.5	11.1	4.1	4.5	4.5				
03/03/16	22:36:48 PST	0.08	11.2	12.4	4.2	4.2	4.2				
03/03/16	22:39:30 PST	0.08	12.7	12.1	5.2	4.2	4.2				
03/03/16	22:42:12 PST	0.11	12.7	12.1	5.1	4.2	4.2				
03/03/16	22:44:54 PST	0.14	12.5	12.4	5.2	4.4	4.4				
03/03/16	22:47:36 PST	0.13	12.6	12.2	5.2	4.4	4.4				
03/03/16	22:50:18 PST	0.13	11.4	11.9	4.7	4.1	4.1				
03/03/16	22:53:00 PST	0.13	11.5	11.7	4.6	4.0	4.0				
03/03/16	22:55:42 PST	0.13	11.4	11.4	4.6	4.2	4.2				
03/03/16	22:58:24 PST	0.12	12.2	12.0	5.1	4.2	4.2				
03/03/16	23:01:06 PST	0.12	12.5	11.7	5.1	4.1	4.1				
03/03/16	23:03:48 PST	0.12	11.0	11.7	4.5	4.5	4.5				
03/03/16	23:06:30 PST	0.12	11.5	11.5	4.6	4.6	4.6				

Date	Time	(1) NTU		(2) MGD		(3) MGD		(4) FT		(5) FT	
		ACTUAL VAL	NTU	ACTUAL VAL	MGD	ACTUAL VAL	MGD	ACTUAL VAL	FT	ACTUAL VAL	FT
03/03/16	23:09:12 PST	0.12	10.7	9.7	9.9	4.4	3.3	3.3	3.3		
03/03/16	23:11:54 PST	0.12	9.7	9.9	9.9	3.9	3.4	3.4	3.4		
03/03/16	23:14:36 PST	0.11	9.6	9.9	9.9	3.9	3.4	3.4	3.4		
03/03/16	23:17:18 PST	0.10	9.6	10.0	10.0	4.0	3.6	3.6	3.6		
03/03/16	23:20:00 PST	0.10	9.8	9.7	9.7	4.0	3.5	3.5	3.5		
03/03/16	23:22:42 PST	0.10	9.7	10.1	9.7	3.9	3.4	3.4	3.4		
03/03/16	23:25:24 PST	0.10	9.8	9.9	9.5	4.1	3.5	3.5	3.5		
03/03/16	23:28:06 PST	0.08	9.9	9.6	9.7	4.1	3.3	3.3	3.3		
03/03/16	23:30:48 PST	0.08	9.6	9.5	9.6	4.1	3.4	3.4	3.4		
03/03/16	23:33:30 PST	0.08	9.5	9.7	9.5	4.0	3.4	3.4	3.4		
03/03/16	23:36:12 PST	0.08	9.4	9.7	10.0	4.1	3.5	3.5	3.5		
03/03/16	23:38:54 PST	0.08	9.7	10.2	10.2	4.6	3.7	3.7	3.7		
03/03/16	23:41:36 PST	0.08	10.4	9.9	9.8	4.4	3.6	3.6	3.6		
03/03/16	23:44:18 PST	0.08	10.2	9.9	9.8	4.5	3.5	3.5	3.5		
03/03/16	23:47:00 PST	0.08	10.4	9.7	9.7	4.5	3.6	3.6	3.6		
03/03/16	23:49:42 PST	0.08	10.4	9.8	9.8	4.1	3.5	3.5	3.5		
03/03/16	23:52:24 PST	0.10	9.7	9.7	9.8	4.1	3.6	3.6	3.6		
03/03/16	23:55:06 PST	0.10	9.5	9.8	9.8	4.2	3.7	3.7	3.7		
03/03/16	23:57:48 PST	0.10	9.6	9.8	9.8	4.2	3.8	3.8	3.8		
03/04/16	00:00:30 PST	0.09	9.8	10.0	10.0	4.2	3.8	3.8	3.8		
03/04/16	00:03:12 PST	0.09	9.7	10.0	10.0	4.2	3.9	3.9	3.9		
03/04/16	00:05:54 PST	0.09	9.7	10.0	10.0	4.2	3.9	3.9	3.9		
03/04/16	00:08:36 PST	0.09	9.4	9.8	9.8	4.2	3.9	3.9	3.9		
03/04/16	00:11:18 PST	0.09	9.7	9.8	9.8	4.1	3.7	3.7	3.7		
03/04/16	00:14:00 PST	0.09	9.7	9.5	9.5	4.4	3.6	3.6	3.6		
03/04/16	00:16:42 PST	-0.00	9.4	9.8	9.8	4.4	3.6	3.6	3.6		
03/04/16	00:19:24 PST	-0.00	10.5	9.7	9.7	4.3	3.8	3.8	3.8		
03/04/16	00:22:06 PST	-0.00	10.2	10.2	9.6	4.7	3.8	3.8	3.8		
03/04/16	00:24:48 PST	-0.00	10.1	9.8	9.6	4.7	3.8	3.8	3.8		
03/04/16	00:27:30 PST	-0.00	9.5	9.7	9.7	4.7	3.9	3.9	3.9		
03/04/16	00:30:12 PST	-0.00	9.4	9.8	9.8	4.2	3.9	3.9	3.9		
03/04/16	00:32:54 PST	-0.00	9.7	9.6	9.6	4.3	3.8	3.8	3.8		
03/04/16	00:35:36 PST	-0.00	9.5	9.3	9.3	4.4	3.8	3.8	3.8		
03/04/16	00:38:18 PST	-0.00	10.1	10.1	10.1	4.4	3.5	3.5	3.5		
03/04/16	00:41:00 PST	-0.00	9.9	10.0	10.0	4.8	4.1	4.1	4.1		
03/04/16	00:43:42 PST	-0.00	10.0	10.0	9.9	4.7	4.1	4.1	4.1		
03/04/16	00:46:24 PST	-0.00	10.2	9.8	9.8	4.8	4.0	4.0	4.0		
03/04/16	00:49:06 PST	-0.00	9.4	10.0	10.0	4.7	4.0	4.0	4.0		
03/04/16	00:51:48 PST	-0.00	9.4	9.8	9.8	4.4	4.2	4.2	4.2		
03/04/16	00:54:30 PST	-0.00	9.5	9.9	9.9	4.4	4.1	4.1	4.1		
03/04/16	00:57:12 PST	-0.00	9.7	10.0	10.0	4.5	4.2	4.2	4.2		
03/04/16	01:02:36 PST	-0.00	10.7	9.7	9.7	4.6	4.0	4.0	4.0		
03/04/16	01:05:18 PST	-0.00	10.1	10.0	10.0	5.2	4.1	4.1	4.1		
03/04/16	01:08:00 PST	-0.00	10.2	10.0	10.0	4.9	4.0	4.0	4.0		
03/04/16	01:10:42 PST	-0.00	10.0	10.0	10.0	4.9	4.2	4.2	4.2		
03/04/16	01:13:24 PST	-0.00	9.4	9.5	9.5	4.9	4.2	4.2	4.2		
03/04/16	01:16:06 PST	-0.00	9.3	9.5	9.5	4.5	4.0	4.0	4.0		
03/04/16	01:18:48 PST	-0.00	10.5	11.2	11.2	4.6	4.2	4.2	4.2		
03/04/16	01:21:30 PST	-0.00	11.0	11.5	11.5	5.4	5.0	5.0	5.0		
03/04/16	01:24:12 PST	-0.00	12.4	12.3	12.1	5.5	5.3	5.3	5.3		
03/04/16	01:26:54 PST	-0.00	12.3	12.3	12.9	6.4	5.7	5.7	5.7		
03/04/16	01:29:36 PST	-0.00	12.3	12.3	12.6	6.3	6.0	6.0	6.0		
03/04/16	01:32:18 PST	-0.00	11.9	11.7	12.1	6.3	5.8	5.8	5.8		
03/04/16	01:35:00 PST	-0.00	11.7	11.5	11.6	6.0	5.5	5.5	5.5		
03/04/16	01:37:42 PST	-0.00	11.5	11.4	11.2	5.9	5.3	5.3	5.3		
03/04/16	01:40:24 PST	-0.00	11.4	11.2	11.7	5.9	5.0	5.0	5.0		
03/04/16	01:43:06 PST	-0.00	11.2	11.7	11.7	5.8	5.5	5.5	5.5		
03/04/16	01:45:48 PST	-0.00	11.0	11.0	11.4	5.8	5.4	5.4	5.4		
03/04/16	01:48:30 PST	-0.00	11.0	11.0	11.4	5.7	5.0	5.0	5.0		
03/04/16	01:51:12 PST	-0.00	11.0	11.0	11.4	5.7	5.0	5.0	5.0		
03/04/16	01:53:54 PST	-0.00	10.7	10.7	11.2	5.5	5.5	5.5	5.5		
03/04/16	01:56:36 PST	-0.00	10.1	10.2	12.0	6.0	5.5	5.5	5.5		
03/04/16	01:59:18 PST	-0.00	10.0	10.0	12.0	6.0	5.5	5.5	5.5		
03/04/16	02:02:00 PST	-0.00	9.4	9.4	12.1	6.3	5.8	5.8	5.8		
03/04/16	02:04:42 PST	-0.00	9.3	9.3	12.1	6.3	5.8	5.8	5.8		
03/04/16	02:07:24 PST	-0.00	10.5	11.0	12.1	6.0	5.5	5.5	5.5		
03/04/16	02:10:06 PST	-0.00	11.0	11.0	12.0	6.0	5.5	5.5	5.5		
03/04/16	02:12:48 PST	-0.00	12.4	12.3	12.1	6.0	5.5	5.5	5.5		
03/04/16	02:15:30 PST	-0.00	12.3	12.3	12.0	6.0	5.5	5.5	5.5		
03/04/16	02:18:12 PST	-0.00	12.3	12.3	12.0	6.0	5.5	5.5	5.5		
03/04/16	02:20:54 PST	-0.00	12.3	12.3	12.0	6.0	5.5	5.5	5.5		
03/04/16	02:23:36 PST	-0.00	11.9	11.7	11.7	5.9	5.3	5.3	5.3		
03/04/16	02:26:18 PST	-0.00	11.5	11.5	11.6	5.8	5.3	5.3	5.3		
03/04/16	02:29:00 PST	-0.00	11.4	11.4	11.2	5.9	5.0	5.0	5.0		
03/04/16	02:31:42 PST	-0.00	11.2	11.2	11.7	5.8	5.5	5.5	5.5		
03/04/16	02:34:24 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	02:37:06 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	02:39:48 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	02:42:30 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	02:45:12 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	02:47:54 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	02:50:36 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	02:53:18 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	02:56:00 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	02:58:42 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:01:24 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:04:06 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:06:48 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:09:30 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:12:12 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:14:54 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:17:36 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:20:18 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:23:00 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:25:42 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:28:24 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:31:06 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:33:48 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:36:30 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:39:12 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:41:54 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:44:36 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:47:18 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:50:00 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:52:42 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:55:24 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	03:58:06 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:00:48 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:03:30 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:06:12 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:08:54 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:11:36 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:14:18 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:17:00 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:19:42 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:22:24 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:25:06 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:27:48 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:30:30 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:33:12 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:35:54 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:38:36 PST	-0.00	11.0	11.0	11.7	5.8	5.5	5.5	5.5		
03/04/16	04:41:18 PST	-0.00	11.0	11.0	11						

Date	Time	(1) NTU		(2) MGD		(3) MGD		(4) FT		(5) FT	
		ACTUAL VAL									
03/04/16	01:45:48 PST	-0.00	12.1	11.9	11.9	11.9	6.3	5.6	5.6		
03/04/16	01:48:30 PST	-0.00	11.1	9.8	9.8	9.8	5.6	4.3	4.3		
03/04/16	01:51:12 PST	-0.00	9.6	10.3	10.3	10.3	4.9	4.6	4.6		
03/04/16	01:53:54 PST	-0.00	10.1	9.4	9.4	9.4	5.1	4.1	4.1		
03/04/16	01:56:36 PST	-0.00	9.9	10.7	10.7	10.7	5.1	4.9	4.9		
03/04/16	01:59:18 PST	-0.00	10.0	10.8	10.8	10.8	5.1	5.0	5.0		
03/04/16	02:02:00 PST	-0.00	10.0	10.0	10.0	10.0	5.1	4.7	4.7		
03/04/16	02:04:42 PST	-0.00	10.7	10.3	10.3	10.3	5.4	4.9	4.9		
03/04/16	02:07:24 PST	-0.00	10.2	9.6	9.6	9.6	5.3	4.3	4.3		
03/04/16	02:10:06 PST	-0.00	9.6	9.7	9.7	9.7	5.0	4.4	4.4		
03/04/16	02:12:48 PST	-0.00	9.6	9.8	9.8	9.8	5.1	4.6	4.6		
03/04/16	02:15:30 PST	-0.00	9.8	9.9	9.9	9.9	5.1	4.5	4.5		
03/04/16	02:18:12 PST	-0.00	9.7	9.8	9.8	9.8	5.1	4.6	4.6		
03/04/16	02:20:54 PST	-0.00	9.7	10.7	10.7	10.7	5.1	5.3	5.3		
03/04/16	02:23:36 PST	-0.00	9.7	9.9	9.9	9.9	5.2	4.5	4.5		
03/04/16	02:26:18 PST	-0.00	10.2	9.9	9.9	9.9	5.2	4.7	4.7		
03/04/16	02:29:00 PST	-0.00	10.3	9.8	9.8	9.8	5.6	4.9	4.9		
03/04/16	02:31:42 PST	-0.00	10.3	10.0	10.0	10.0	5.6	4.8	4.8		
03/04/16	02:34:24 PST	-0.00	10.3	9.9	9.9	9.9	5.6	5.1	5.1		
03/04/16	02:37:06 PST	-0.00	9.1	10.2	10.2	10.2	5.5	4.9	4.9		
03/04/16	02:39:48 PST	-0.00	9.6	9.9	9.9	9.9	5.1	4.5	4.5		
03/04/16	02:42:30 PST	-0.00	9.3	9.4	9.4	9.4	5.1	4.5	4.5		
03/04/16	02:45:12 PST	-0.00	9.5	9.6	9.6	9.6	5.1	4.8	4.8		
03/04/16	02:47:54 PST	-0.00	10.5	9.6	9.6	9.6	5.2	4.7	4.7		
03/04/16	02:50:36 PST	-0.00	10.2	9.6	9.6	9.6	5.6	4.7	4.7		
03/04/16	02:53:18 PST	-0.00	10.2	9.9	9.9	9.9	5.7	5.0	5.0		
03/04/16	02:56:00 PST	-0.00	10.2	9.8	9.8	9.8	5.7	5.1	5.1		
03/04/16	02:58:42 PST	-0.00	10.2	10.0	10.0	10.0	5.7	5.1	5.1		
03/04/16	03:01:24 PST	-0.00	9.9	10.0	10.0	10.0	5.6	5.0	5.0		
03/04/16	03:04:06 PST	-0.00	9.9	9.8	9.8	9.8	5.7	5.0	5.0		
03/04/16	03:06:48 PST	-0.00	10.0	9.8	9.8	9.8	5.7	5.0	5.0		
03/04/16	03:09:30 PST	-0.00	9.9	9.8	9.8	9.8	5.6	4.6	4.6		
03/04/16	03:12:12 PST	-0.00	9.5	9.5	9.5	9.5	5.3	5.1	5.1		
03/04/16	03:14:54 PST	-0.00	9.1	9.8	9.8	9.8	5.2	4.6	4.6		
03/04/16	03:17:36 PST	-0.00	9.3	9.8	9.8	9.8	5.5	5.2	5.2		
03/04/16	03:20:18 PST	-0.00	9.5	9.9	9.9	9.9	5.5	5.5	5.5		
03/04/16	03:23:00 PST	-0.00	10.2	10.1	10.1	10.1	6.0	5.4	5.4		
03/04/16	03:25:42 PST	-0.00	10.2	10.0	10.0	10.0	5.9	5.3	5.3		
03/04/16	03:28:24 PST	-0.00	10.1	9.9	9.9	9.9	5.2	5.2	5.2		
03/04/16	03:31:06 PST	-0.00	9.9	9.9	9.9	9.9	5.7	5.7	5.7		
03/04/16	03:33:48 PST	-0.00	9.9	10.3	10.3	10.3	6.7	6.7	6.7		
03/04/16	03:36:30 PST	-0.00	11.2	11.8	11.8	11.8	6.9	6.9	6.9		
03/04/16	03:39:12 PST	-0.00	12.3	12.0	12.0	12.0	7.5	6.9	6.9		
03/04/16	03:41:54 PST	-0.00	11.7	12.3	12.3	12.3	7.0	6.7	6.7		
03/04/16	03:44:36 PST	-0.00	11.7	12.2	12.2	12.2	7.7	6.7	6.7		
03/04/16	03:47:18 PST	-0.00	11.9	12.0	12.0	12.0	6.9	6.5	6.5		
03/04/16	03:50:00 PST	-0.00	11.9	11.9	11.9	11.9	7.2	6.6	6.6		
03/04/16	03:52:42 PST	-0.00	12.0	12.1	12.1	12.1	7.2	6.7	6.7		
03/04/16	03:55:24 PST	-0.00	12.0	12.0	12.0	12.0	7.3	6.7	6.7		
03/04/16	03:58:06 PST	-0.00	12.0	10.9	10.9	10.9	7.4	5.9	5.9		
03/04/16	04:00:48 PST	-0.00	11.6	12.0	12.0	12.0	7.0	6.8	6.8		
03/04/16	04:03:30 PST	-0.00	11.7	12.0	12.0	12.0	7.0	6.9	6.9		
03/04/16	04:06:12 PST	-0.00	11.5	11.1	11.1	11.1	7.0	5.9	5.9		
03/04/16	04:08:54 PST	-0.00	9.9	10.1	10.1	10.1	5.8	5.4	5.4		
03/04/16	04:11:36 PST	-0.00	10.0	10.2	10.2	10.2	5.8	5.7	5.7		
03/04/16	04:14:18 PST	-0.00	10.0	10.2	10.2	10.2	6.0	5.7	5.7		
03/04/16	04:17:00 PST	-0.00	10.0	10.2	10.2	10.2	6.0	5.7	5.7		
03/04/16	04:19:42 PST	-0.00	10.5	10.6	10.6	10.6	6.4	6.1	6.1		

Date	Time	(1) NHU		(2) MGD		(3) MGD		(4) FT		(5) FT	
		ACTUAL VAL	VAL								
03/04/16	04:22:24 PST	-0.00		10.5		10.1		6.4		5.6	
03/04/16	04:25:06 PST	-0.00		10.3		9.3		6.4		5.0	
03/04/16	04:27:48 PST	-0.00		9.7		9.6		5.9		5.4	
03/04/16	04:30:30 PST	-0.00		9.8		9.6		6.0		5.3	
03/04/16	04:33:12 PST	-0.00		9.8		9.7		6.0		5.6	
03/04/16	04:35:54 PST	-0.00		9.9		10.3		6.1		6.0	
03/04/16	04:38:36 PST	-0.00		9.7		10.0		6.0		5.8	
03/04/16	04:41:18 PST	-0.00		9.7		10.1		6.2		5.8	
03/04/16	04:44:00 PST	-0.00		9.6		10.0		6.2		5.8	
03/04/16	04:46:42 PST	-0.00		9.8		9.8		6.3		5.6	
03/04/16	04:49:24 PST	-0.00		9.8		9.5		6.3		5.4	
03/04/16	04:52:06 PST	-0.00		9.6		9.7		6.3		5.5	
03/04/16	04:54:48 PST	-0.00		9.8		9.7		6.2		5.5	
03/04/16	04:57:30 PST	-0.00		9.7		9.6		6.3		5.9	
03/04/16	05:00:12 PST	-0.00		9.9		9.7		6.3		5.5	
03/04/16	05:02:54 PST	-0.00		9.9		10.3		6.3		5.8	
03/04/16	05:05:36 PST	-0.00		9.6		9.7		6.3		6.3	
03/04/16	05:08:18 PST	-0.00		10.3		9.9		6.3		5.6	
03/04/16	05:11:00 PST	-0.00		10.3		9.9		6.8		5.7	
03/04/16	05:13:42 PST	-0.00		10.0		9.3		6.5		5.5	
03/04/16	05:16:24 PST	-0.00		10.3		9.7		6.8		5.8	
03/04/16	05:19:06 PST	-0.00		10.0		9.8		6.6		6.0	
03/04/16	05:21:48 PST	-0.00		9.8		9.9		6.3		6.1	
03/04/16	05:24:30 PST	-0.00		9.6		10.1		6.4		6.2	
03/04/16	05:27:12 PST	-0.00		9.4		10.4		6.2		6.5	
03/04/16	05:29:54 PST	-0.00		9.5		10.1		6.4		6.2	
03/04/16	05:32:36 PST	-0.00		9.8		10.2		6.4		6.3	
03/04/16	05:35:18 PST	-0.00		9.8		9.6		6.5		6.0	
03/04/16	05:38:00 PST	-0.00		9.7		10.1		6.5		6.4	
03/04/16	05:40:42 PST	-0.00		10.6		9.7		7.2		5.9	
03/04/16	05:43:24 PST	-0.00		10.1		9.8		6.8		6.2	
03/04/16	05:46:06 PST	-0.00		10.1		9.9		6.9		6.4	
03/04/16	05:48:48 PST	-0.00		10.1		9.8		6.9		6.3	
03/04/16	05:51:30 PST	-0.00		10.0		9.8		6.8		6.3	
03/04/16	05:54:12 PST	-0.00		9.8		10.4		6.8		7.1	
03/04/16	05:56:54 PST	-0.00		10.2		10.1		7.1		6.4	
03/04/16	05:59:36 PST	-0.00		9.6		9.7		6.7		6.3	
03/04/16	06:02:18 PST	-0.00		10.2		9.5		7.0		6.0	
03/04/16	06:05:00 PST	-0.00		8.4		9.6		6.0		6.3	
03/04/16	06:07:42 PST	-0.00		8.4		8.3		5.6		5.0	
03/04/16	06:10:24 PST	-0.00		0.8		1.9		0.0		0.4	
03/04/16	06:13:06 PST	-0.00		0.7		-0.0		0.0		0.0	
03/04/16	06:15:48 PST	-0.00		0.9		-0.0		0.0		0.0	
03/04/16	06:18:30 PST	-0.00		1.2		-0.0		0.0		0.0	
03/04/16	06:21:12 PST	-0.00		1.2		-0.0		0.0		0.0	
03/04/16	06:23:54 PST	-0.00		0.7		-0.0		0.0		0.0	
03/04/16	06:26:36 PST	-0.00		0.7		-0.0		0.0		0.0	
03/04/16	06:29:18 PST	-0.00		0.7		0.1		0.0		0.0	
03/04/16	06:32:00 PST	-0.00		0.7		0.0		0.0		0.0	
03/04/16	06:34:42 PST	-0.00		0.7		0.0		0.0		0.0	
03/04/16	06:37:24 PST	-0.00		0.7		-0.0		0.0		0.0	
03/04/16	06:40:06 PST	-0.00		0.7		-0.0		0.0		0.0	
03/04/16	06:42:48 PST	-0.00		3.7		3.9		0.5		0.0	
03/04/16	06:45:30 PST	-0.00		6.9		7.0		1.2		0.0	
03/04/16	06:48:12 PST	-0.00		8.2		8.4		1.5		0.7	
03/04/16	06:50:54 PST	-0.00		9.8		9.5		1.7		0.9	
03/04/16	06:53:36 PST	-0.00		9.6		10.2		1.8		1.1	
03/04/16	06:56:18 PST	-0.00		9.7		10.3		1.8		1.2	
03/04/16	06:59:00 PST	-0.00		10.8		9.8		2.1		1.1	

Date	Time	(1) NTG		(2) MGD		(3) MGD		(4) FT		(5) FT	
		ACTUAL VAL	MGD	ACTUAL VAL	MGD	ACTUAL VAL	MGD	ACTUAL VAL	MGD	ACTUAL VAL	MGD
03/04/16	06:59:00 PST	400	-0.00	9.6	9.7	9.7	9.7	1.9	1.9	1.1	1.1
03/04/16	07:01:42 PST	401	-0.00	9.6	9.5	9.5	9.5	1.9	1.9	1.1	1.1
03/04/16	07:04:24 PST	402	-0.00	9.9	9.7	9.7	9.7	1.9	1.9	1.2	1.2
03/04/16	07:07:06 PST	403	-0.00	9.6	10.2	10.2	10.2	2.2	2.2	1.2	1.2
03/04/16	07:09:48 PST	404	-0.00	10.9	10.1	10.1	10.1	1.9	1.9	1.2	1.2
03/04/16	07:12:30 PST	405	-0.00	9.5	9.9	9.9	9.9	1.9	1.9	1.2	1.2
03/04/16	07:15:12 PST	406	-0.00	9.8	9.6	9.6	9.6	2.0	2.0	1.2	1.2
03/04/16	07:17:54 PST	407	-0.00	9.8	9.7	9.7	9.7	2.0	2.0	1.1	1.1
03/04/16	07:20:36 PST	408	-0.00	9.9	9.6	9.6	9.6	2.0	2.0	1.2	1.2
03/04/16	07:23:18 PST	409	-0.00	9.9	10.0	10.0	10.0	2.0	2.0	1.3	1.3
03/04/16	07:26:00 PST	410	-0.00	9.5	9.9	9.9	9.9	2.0	2.0	1.3	1.3
03/04/16	07:28:42 PST	411	-0.00	9.6	10.1	10.1	10.1	2.4	2.4	1.3	1.3
03/04/16	07:31:24 PST	412	-0.00	10.8	10.0	10.0	10.0	2.1	2.1	1.2	1.2
03/04/16	07:34:06 PST	413	-0.00	10.0	9.9	9.9	9.9	2.0	2.0	1.3	1.3
03/04/16	07:36:48 PST	414	-0.00	9.9	9.9	9.9	9.9	2.0	2.0	1.3	1.3
03/04/16	07:39:30 PST	415	-0.00	9.8	9.9	9.9	9.9	2.0	2.0	1.3	1.3
03/04/16	07:42:12 PST	416	-0.00	9.7	9.9	9.9	9.9	2.0	2.0	1.3	1.3
03/04/16	07:44:54 PST	417	-0.00	9.7	9.9	9.9	9.9	2.0	2.0	1.3	1.3
03/04/16	07:47:36 PST	418	-0.00	9.8	10.0	10.0	10.0	2.1	2.1	1.3	1.3
03/04/16	07:50:18 PST	419	-0.00	9.6	9.9	9.9	9.9	2.0	2.0	1.3	1.3
03/04/16	07:53:00 PST	420	-0.00	9.7	10.1	10.1	10.1	2.5	2.5	1.3	1.3
03/04/16	07:55:42 PST	421	-0.00	11.1	9.9	9.9	9.9	2.1	2.1	1.3	1.3
03/04/16	07:58:24 PST	422	-0.00	9.7	9.9	9.9	9.9	2.1	2.1	1.3	1.3
03/04/16	08:01:06 PST	423	-0.00	9.4	9.8	9.8	9.8	2.1	2.1	1.2	1.2
03/04/16	08:03:48 PST	424	-0.00	10.0	9.7	9.7	9.7	2.0	2.0	1.3	1.3
03/04/16	08:06:30 PST	425	-0.00	9.8	10.2	10.2	10.2	2.0	2.0	1.4	1.4
03/04/16	08:09:12 PST	426	-0.00	9.9	9.9	9.9	9.9	2.1	2.1	1.3	1.3
03/04/16	08:11:54 PST	427	-0.00	9.7	9.9	9.9	9.9	2.1	2.1	1.4	1.4
03/04/16	08:14:36 PST	428	-0.00	9.8	10.4	10.4	10.4	2.3	2.3	1.3	1.3
03/04/16	08:17:18 PST	429	-0.00	10.4	9.7	9.7	9.7	1.4	1.4	1.4	1.4
03/04/16	08:20:00 PST	430	-0.00	9.7	10.1	10.1	10.1	2.2	2.2	1.4	1.4
03/04/16	08:22:42 PST	431	-0.00	9.8	9.8	9.8	9.8	2.1	2.1	1.3	1.3
03/04/16	08:25:24 PST	432	-0.00	9.6	9.9	9.9	9.9	2.1	2.1	1.4	1.4
03/04/16	08:28:06 PST	433	-0.00	9.8	10.1	10.1	10.1	2.1	2.1	1.5	1.5
03/04/16	08:30:48 PST	434	-0.00	9.8	10.0	10.0	10.0	2.5	2.5	1.5	1.5
03/04/16	08:33:30 PST	435	-0.00	11.0	10.6	10.6	10.6	2.9	2.9	2.1	2.1
03/04/16	08:36:12 PST	436	-0.00	12.2	12.0	12.0	12.0	3.3	3.3	2.7	2.7
03/04/16	08:38:54 PST	437	-0.00	12.9	13.6	13.6	13.6	3.3	3.3	2.5	2.5
03/04/16	08:41:36 PST	438	-0.00	13.0	13.1	13.1	13.1	2.9	2.9	2.4	2.4
03/04/16	08:44:18 PST	439	-0.00	11.9	12.6	12.6	12.6	3.0	3.0	2.4	2.4
03/04/16	08:47:00 PST	440	-0.00	12.3	12.6	12.6	12.6	3.0	3.0	1.6	1.6
03/04/16	08:49:42 PST	441	-0.00	12.0	10.5	10.5	10.5	2.9	2.9	2.2	2.2
03/04/16	08:52:24 PST	442	-0.00	12.1	12.4	12.4	12.4	2.9	2.9	1.9	1.9
03/04/16	08:55:06 PST	443	-0.00	11.8	10.9	10.9	10.9	2.9	2.9	1.6	1.6
03/04/16	08:57:48 PST	444	-0.00	11.4	10.4	10.4	10.4	2.8	2.8	1.9	1.9
03/04/16	09:00:30 PST	445	-0.00	11.4	10.8	10.8	10.8	2.8	2.8	1.7	1.7
03/04/16	09:03:12 PST	446	-0.00	10.9	10.4	10.4	10.4	3.0	3.0	2.1	2.1
03/04/16	09:05:54 PST	447	-0.00	12.2	11.4	11.4	11.4	2.8	2.8	1.8	1.8
03/04/16	09:08:36 PST	448	-0.00	11.4	10.5	10.5	10.5	2.8	2.8	1.7	1.7
03/04/16	09:11:18 PST	449	-0.00	10.7	10.1	10.1	10.1	2.5	2.5	1.6	1.6
03/04/16	09:14:00 PST	450	-0.00	9.2	10.0	10.0	10.0	2.2	2.2	1.8	1.8
03/04/16	09:16:42 PST	451	-0.00	9.0	10.2	10.2	10.2	2.2	2.2	1.7	1.7
03/04/16	09:19:24 PST	452	-0.00	10.5	10.3	10.3	10.3	2.5	2.5	1.6	1.6
03/04/16	09:22:06 PST	453	-0.00	10.4	9.8	9.8	9.8	2.5	2.5	1.5	1.5
03/04/16	09:24:48 PST	454	-0.00	10.4	9.6	9.6	9.6	2.6	2.6	1.5	1.5
03/04/16	09:27:30 PST	455	-0.00	9.1	9.5	9.5	9.5	2.3	2.3	1.6	1.6
03/04/16	09:30:12 PST	456	-0.00	9.2	9.8	9.8	9.8	2.3	2.3	1.7	1.7
03/04/16	09:32:54 PST	457	-0.00	9.6	10.0	10.0	10.0	2.3	2.3	1.7	1.7

Date	Time	(1) NTU		(2) MGD		(3) MGD		(4) FT		(5) FT	
		ACTUAL VAL	NTU	ACTUAL VAL	MGD	ACTUAL VAL	MGD	ACTUAL VAL	FT	ACTUAL VAL	FT
03/04/16	12:12:12 PST	516	-0.00	9.2	9.6	9.6	9.6	3.0	3.0	2.3	2.3
03/04/16	12:14:54 PST	517	-0.00	9.6	9.8	9.8	9.8	3.0	3.0	2.4	2.4
03/04/16	12:17:36 PST	518	-0.00	10.6	10.1	10.1	10.1	3.6	3.6	2.6	2.6
03/04/16	12:20:18 PST	519	-0.00	10.5	10.2	10.2	10.2	3.4	3.4	2.7	2.7
03/04/16	12:23:00 PST	520	-0.00	10.3	10.4	10.4	10.4	3.4	3.4	2.7	2.7
03/04/16	12:25:42 PST	521	-0.00	10.0	9.6	9.6	9.6	3.0	3.0	2.5	2.5
03/04/16	12:28:24 PST	522	-0.00	9.3	9.7	9.7	9.7	3.0	3.0	2.5	2.5
03/04/16	12:31:06 PST	523	-0.00	9.2	9.8	9.8	9.8	3.1	3.1	2.6	2.6
03/04/16	12:33:48 PST	524	-0.00	9.5	9.8	9.8	9.8	3.1	3.1	2.5	2.5
03/04/16	12:36:30 PST	525	-0.00	9.8	10.0	10.0	10.0	3.2	3.2	2.6	2.6
03/04/16	12:39:12 PST	526	-0.00	10.4	10.4	10.4	10.4	3.6	3.6	2.6	2.6
03/04/16	12:41:54 PST	527	-0.00	10.4	10.0	10.0	10.0	3.5	3.5	2.7	2.7
03/04/16	12:44:36 PST	528	-0.00	10.2	10.0	10.0	10.0	3.5	3.5	2.7	2.7
03/04/16	12:47:18 PST	529	-0.00	9.8	9.9	9.9	9.9	3.4	3.4	2.7	2.7
03/04/16	12:50:00 PST	530	-0.00	10.1	9.8	9.8	9.8	3.5	3.5	2.7	2.7
03/04/16	12:52:42 PST	531	-0.00	9.9	9.4	9.4	9.4	3.4	3.4	2.5	2.5
03/04/16	12:55:24 PST	532	-0.00	9.2	9.5	9.5	9.5	3.1	3.1	2.6	2.6
03/04/16	12:58:06 PST	533	-0.00	9.4	10.0	10.0	10.0	3.2	3.2	2.8	2.8
03/04/16	13:00:48 PST	534	-0.00	9.4	9.9	9.9	9.9	3.3	3.3	2.7	2.7
03/04/16	13:03:30 PST	535	-0.00	10.4	9.8	9.8	9.8	3.8	3.8	2.7	2.7
03/04/16	13:06:12 PST	536	-0.00	10.4	9.8	9.8	9.8	3.7	3.7	2.8	2.8
03/04/16	13:08:54 PST	537	-0.00	9.9	9.9	9.9	9.9	3.5	3.5	2.8	2.8
03/04/16	13:11:36 PST	538	-0.00	10.2	10.3	10.3	10.3	3.6	3.6	3.1	3.1
03/04/16	13:14:18 PST	539	-0.00	10.0	9.7	9.7	9.7	3.7	3.7	2.7	2.7
03/04/16	13:17:00 PST	540	-0.00	9.9	9.9	9.9	9.9	3.6	3.6	2.9	2.9
03/04/16	13:19:42 PST	541	-0.00	9.8	9.5	9.5	9.5	3.6	3.6	2.8	2.8
03/04/16	13:22:24 PST	542	-0.00	9.9	9.9	9.9	9.9	3.7	3.7	3.0	3.0
03/04/16	13:25:06 PST	543	-0.00	9.1	9.8	9.8	9.8	3.3	3.3	2.9	2.9
03/04/16	13:27:48 PST	544	-0.00	9.5	9.9	9.9	9.9	3.5	3.5	2.9	2.9
03/04/16	13:30:30 PST	545	-0.00	9.3	10.1	10.1	10.1	3.5	3.5	3.0	3.0
03/04/16	13:33:12 PST	546	0.00	10.2	10.0	10.0	10.0	3.9	3.9	3.1	3.1
03/04/16	13:35:54 PST	547	-0.00	10.5	10.0	10.0	10.0	3.9	3.9	2.9	2.9
03/04/16	13:38:36 PST	548	-0.00	10.1	10.0	10.0	10.0	3.8	3.8	3.0	3.0
03/04/16	13:41:18 PST	549	-0.00	10.2	9.7	9.7	9.7	3.8	3.8	2.9	2.9
03/04/16	13:44:00 PST	550	2.00	9.7	9.4	9.4	9.4	3.8	3.8	2.8	2.8
03/04/16	13:46:42 PST	551	0.00	10.0	9.9	9.9	9.9	3.9	3.9	3.1	3.1
03/04/16	13:49:24 PST	552	0.00	10.1	9.8	9.8	9.8	3.8	3.8	3.1	3.1
03/04/16	13:52:06 PST	553	0.00	9.8	9.9	9.9	9.9	3.8	3.8	3.0	3.0
03/04/16	13:54:48 PST	554	0.00	9.6	10.2	10.2	10.2	3.8	3.8	3.2	3.2
03/04/16	13:57:30 PST	555	0.00	10.1	9.9	9.9	9.9	3.8	3.8	3.2	3.2
03/04/16	14:00:12 PST	556	0.00	10.1	9.9	9.9	9.9	3.9	3.9	3.2	3.2
03/04/16	14:02:54 PST	557	0.00	9.8	9.8	9.8	9.8	3.9	3.9	3.2	3.2
03/04/16	14:05:36 PST	558	0.00	10.0	9.9	9.9	9.9	3.8	3.8	3.2	3.2
03/04/16	14:08:18 PST	559	0.00	10.0	9.5	9.5	9.5	4.0	4.0	3.1	3.1
03/04/16	14:11:00 PST	560	0.00	10.5	10.5	10.5	10.5	4.4	4.4	3.6	3.6
03/04/16	14:13:42 PST	561	2.00	11.5	12.0	12.0	12.0	4.7	4.7	4.3	4.3
03/04/16	14:16:24 PST	562	2.00	12.3	12.4	12.4	12.4	5.1	5.1	4.4	4.4
03/04/16	14:19:06 PST	563	2.00	13.1	12.4	12.4	12.4	5.5	5.5	4.3	4.3
03/04/16	14:21:48 PST	564	-0.00	12.8	12.0	12.0	12.0	5.2	5.2	4.3	4.3
03/04/16	14:24:30 PST	565	-0.00	11.6	12.4	12.4	12.4	4.6	4.6	4.5	4.5
03/04/16	14:27:12 PST	566	-0.00	11.6	12.3	12.3	12.3	4.7	4.7	4.6	4.6
03/04/16	14:29:54 PST	567	-0.00	11.5	11.5	11.5	11.5	4.7	4.7	3.9	3.9
03/04/16	14:32:36 PST	568	-0.00	11.8	11.5	11.5	11.5	4.9	4.9	4.2	4.2
03/04/16	14:35:18 PST	569	-0.00	11.8	11.7	11.7	11.7	4.9	4.9	4.3	4.3
03/04/16	14:38:00 PST	570	-0.00	11.6	11.7	11.7	11.7	4.8	4.8	4.1	4.1
03/04/16	14:40:42 PST	571	-0.00	11.7	11.8	11.8	11.8	4.9	4.9	4.4	4.4
03/04/16	14:43:24 PST	572	-0.00	11.1	11.1	11.1	11.1	4.8	4.8	3.2	3.2
03/04/16	14:46:06 PST	573	-0.00	11.2	10.4	10.4	10.4	4.7	4.7	3.6	3.6

Date	Time	(1)		(2)		(3)		(4)		(5)	
		INTG ACTUAL VAL	ACTUAL VAL	MGD ACTUAL VAL	ACTUAL VAL	MGD ACTUAL VAL	ACTUAL VAL	FT ACTUAL VAL	ACTUAL VAL	FT ACTUAL VAL	ACTUAL VAL
03/04/16	14:48:48 PST	574	-0.00	10.0	10.2	4.0	4.0	3.4	3.4	3.4	
03/04/16	14:51:30 PST	575	-0.00	9.9	10.2	4.0	4.0	3.5	3.5	3.5	
03/04/16	14:54:12 PST	576	0.41	9.6	10.1	4.1	4.1	3.6	3.6	3.6	
03/04/16	14:56:54 PST	577	2.00	9.4	10.1	4.2	4.2	3.6	3.6	3.6	
03/04/16	14:59:36 PST	578	-0.00	10.1	10.1	4.2	4.2	3.5	3.5	3.5	
03/04/16	15:02:18 PST	579	0.07	10.1	9.9	4.2	4.2	3.6	3.6	3.6	
03/04/16	15:05:00 PST	580	0.07	9.9	10.0	4.2	4.2	3.6	3.6	3.6	
03/04/16	15:07:42 PST	581	0.07	10.1	10.0	4.3	4.3	3.6	3.6	3.6	
03/04/16	15:10:24 PST	582	0.07	9.6	9.6	4.1	4.1	3.5	3.5	3.5	
03/04/16	15:13:06 PST	583	0.07	10.0	9.9	4.2	4.2	3.5	3.5	3.5	
03/04/16	15:15:48 PST	584	0.07	9.8	9.8	4.3	4.3	3.6	3.6	3.6	
03/04/16	15:18:30 PST	585	0.07	10.0	10.0	4.4	4.4	3.6	3.6	3.6	
03/04/16	15:21:12 PST	586	0.07	10.0	9.9	4.4	4.4	3.6	3.6	3.6	
03/04/16	15:23:54 PST	587	0.07	9.9	10.2	4.4	4.4	3.9	3.9	3.9	
03/04/16	15:26:36 PST	588	0.07	10.0	10.0	4.4	4.4	3.7	3.7	3.7	
03/04/16	15:29:18 PST	589	0.06	9.6	9.6	4.3	4.3	3.4	3.4	3.4	
03/04/16	15:32:00 PST	590	0.06	10.0	10.0	4.5	4.5	3.8	3.8	3.8	
03/04/16	15:34:42 PST	591	0.06	10.0	10.1	4.4	4.4	4.0	4.0	4.0	
03/04/16	15:37:24 PST	592	0.06	9.6	9.9	4.4	4.4	3.8	3.8	3.8	
03/04/16	15:40:06 PST	593	0.06	9.9	9.9	4.4	4.4	4.0	4.0	4.0	
03/04/16	15:42:48 PST	594	0.06	9.6	10.1	4.5	4.5	4.0	4.0	4.0	
03/04/16	15:45:30 PST	595	0.06	9.7	9.9	4.4	4.4	3.8	3.8	3.8	
03/04/16	15:48:12 PST	596	0.06	9.7	9.7	4.4	4.4	3.7	3.7	3.7	
03/04/16	15:50:54 PST	597	0.06	9.7	10.2	4.5	4.5	4.1	4.1	4.1	
03/04/16	15:53:36 PST	598	0.06	9.9	9.9	4.6	4.6	3.9	3.9	3.9	
03/04/16	15:56:18 PST	599	0.06	9.5	9.7	4.5	4.5	3.9	3.9	3.9	

ATTACHMENT B

Email and LADWP March 2016 LAAFP SWTR
Monthly Report



LAAFP March 2016 Monthly Report

From: Kawada, Dale <Dale.Kawada@ladwp.com>
Sent: Friday, April 08, 2016 7:46 PM
To: Brownstein, Susan@waterboards; Diep, Chi P.@waterboards
Cc: Manoukian, Razmik; Miller, V.N.; Harasick, Richard; Collins, Anselmo; Thompson, Mike
Subject: LAAFP March 2016 Monthly Report
Attachments: Report March 2016.pdf; UV Cover Pages 16-03.pdf; Off_Specification Report 16-03 B.pdf; Daily UV Reactor Operational Report 16-03.pdf; UV Sensor Calibration Check 16-03.pdf

Susan and Chi - Sending this on behalf of Jorge L. Pineda, T5, Water Treatment Supervisor A. Michael E. Thompson, T5, LAAFP Chief Plant Operator is on vacation.

Pretty routine month here at the LAAFP and the UV Plant for February. Treating mostly SWP water to Turbidities are low.

On March 4, 2016 from 00:15 to 15:00 (14 hours, 45 minutes) Mod 2 Filter 12 was reading "0" NTU's due to a Bad Analyzer Bulb. The Operator only took one grab sample at 13:30, with the result of 0.073 NTU's. Several 4 hour Grab Samples were not taken. During the time Mod 2 Filter 12 had the Bad Analyzer Bulb, the Train 3 Turbidities had a high of 0.048 NTU's, which indicates the Filter was probably fine for turbidities. The operator did not notice the Bad Analyzer Bulb until 13:30, due to No Alarms on the computer for Mod 2 Filter 12. This problem has been turned over to the LAAFP Chief Plant Operator to it won't happen again.

Train #4 jet mixer installation project is still ongoing: Due for completion in March April 2016.

Hard copy will go out in the mail today.
If you have any questions, please call.

Dale Kawada
Associate Engineer

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MONTHLY SUMMARY OF MONITORING FOR SURFACE WATER TREATMENT REGULATIONS

Los Angeles Aqueduct Filtration Plant

Data for March 2016

System Number: 19-067

TURBIDITY MONITORING

Filters Exceeding 1.0 NTU in Two Consecutive 15-minute Samples:

Filter	Date and Time	Turbidity, NTU	Also > 1.0 in Each of Previous Two Months?	If so, Deadline for Individual Filter Self-Assessment
None				

Filters Exceeding 2.0 NTU in Two Consecutive 15-minute Samples:

Filter	Date and Time	Turbidity, NTU	Also > 2.0 in Previous Month?	If so, CPE Deadline
None				

Failures in Combined Filter Effluent Continuous Turbidity Monitoring System:

Starting Date and Time	Duration (d:hh:mm)	# 15-Minute Measurements Missed	# Grab Samples Taken	Comments
None				

Failures in Individual Filter Continuous Turbidity Monitoring Systems:

Filter	Starting Date and Time	Duration (d:hh:mm)	# Grabs Taken	Comments
M2F12	03/04/16 00:15	0:14:45	1	Replaced Analyzer Bulb

MONTHLY SUMMARY OF MONITORING FOR SURFACE WATER TREATMENT REGULATIONS

Los Angeles Aqueduct Filtration Plant

Data for March 2016

System Number: 19-067

TURBIDIMETER CALIBRATION

Dates of Turbidimeter Calibrations:

Date	Turbidimeter	Calibration Method
03/01/16	Raw Water	Compared to a Ratio XR
03/01/16	Reclaimed Water	Compared to a Ratio XR
03/01/16	Low/High Plant Effluent	Compared to a Ratio XR
03/09/16	Raw Water	Compared to a Ratio XR
03/09/16	Reclaimed Water	Compared to a Ratio XR
03/09/16	Low/High Plant Effluent	Compared to a Ratio XR
03/17/16	Raw Water	Compared to a Ratio XR
03/17/16	Reclaimed Water	Compared to a Ratio XR
03/17/16	Low/High Plant Effluent	Compared to a Ratio XR
03/25/16	Raw Water	Compared to a Ratio XR
03/25/16	Reclaimed Water	Compared to a Ratio XR
03/25/16	Low/High Plant Effluent	Compared to a Ratio XR
03/31/16	Raw Water	Compared to a Ratio XR
03/31/16	Reclaimed Water	Compared to a Ratio XR
03/31/16	Low/High Plant Effluent	Compared to a Ratio XR

DISINFECTION PROCESS DATA

Disinfectant Residual Type: **Free Chlorine**

Were Inactivation (CT) Requirements Met Each Day: **No**

Incidents with < 0.2 mg/L Residual in Plant Effluent:

Starting Date and Time	Duration (d:hh:mm)	DHS Notification Date and Time	Comments
None			

Total Number of Incidents with < 0.2 mg/L Residual in Effluent: **0**
 Standard Met: (No Period of < 0.2 mg/L Residual Exceeding 4 Hours): **Yes**

ATTACHMENT C

LADWP Incident Report



Los Angeles Aqueduct Filtration Plant (LAAFP)
Incident Report for Module 2, filter #12 Turbidimeter
Date of occurrence: March 4, 2016

Description of Event: On Friday, March 4, 2016, at approximately 00:15 hours, the filter effluent turbidimeter for Module #2, Filter #12 (Turbidimeter) failed. It began displaying erroneous values for turbidity, including negative numbers. The LAAFP Control Room Operator (CRO) did not note any audible or visual alarms at the time on the Distributed Control System (DCS).

This condition continued until approximately 13:15 hours when a Water Treatment Operator (WTO) noticed an alarm signal on the Turbidimeter display in the filter gallery and notified the CRO of the issue. At that point, the CRO directed the same WTO to collect and analyze a grab sample in accordance with Standard Operating Procedures and Surface Water Treatment Rule (SWTR) regulations. The grab sample registered 0.073 NTU. In addition, the CRO contacted the Instrument Shop to make repairs. These were completed at approximately 15:00 hours and consisted of replacing a burnt out lightbulb within the Turbidimeter. At approximately 15:30 hour, the CRO contacted Mike Thompson, the Chief Plant Operator of LAAFP, at home and informed him of what had occurred and that the Turbidimeter was back in service. Mr. Thompson instructed the CRO to trend the turbidimeter value to indicate when the bulb had failed, the CRO stated 12:15pm, and with that information Mr. Thompson determined that one grab sample was appropriate.

On Friday, April 8, 2016, at approximately 18:54 hours, Dale Kawada of the LAAFP sent Mike Thompson an email informing him that during the Turbidimeter failure on March 4, 2016 we had not taken the appropriate number of grab samples. Mr. Kawada was finalizing the LAAFP Monthly Report and discovered that we had only taken one turbidity grab sample over the approximate 15-hour instrument outage. Due to the seriousness of this issue, Mike Thompson investigated the problem.

Findings and Corrective Actions: Mr. Thompson found the following and took the actions noted.

1. On March 4, 2016, the CRO informed Mr. Thompson that the turbidimeter went out of service at 12:15pm. This was incorrect and may have been related to the failure to specify the failure time in terms of the 24-hour clock. Mr. Thompson was told the failure was at 15 minutes past noon (12:15pm or 12:15 hours), and with that information determined that only one grab sample was required. This was incorrect. The instrument failed at 15 minutes past midnight (12:15am or 00:15 hours) and additional grab samples were required during this outage. **Action:** Work with CROs and other personnel to clearly communicate occurrence times and avoid miscommunications. Mike Thompson will conduct refresher training on trending data and reviewing alarm history. In addition, Mike Thompson will review any unusual events reported by the CROs to double check what had occurred and report appropriately.
2. The DCS set point for a "low turbidity alarm" for the Turbidimeter was erroneously set for a negative number. Since the instrument does not truly read or display negative numbers, the alarm did not trigger, failing to alert the CRO of the problem. The investigation proved that all other LAAFP turbidimeter alarms were set for 0.00ntu or 0.01ntu. **Action:** The CRO reset all effluent turbidity alarm setpoints: Low of 0.01 NTU; high alarm #1 at 0.150 NTU. A set point

sheet is posted at the CRO workstation. Additionally, all turbidity alarm setpoints will be "locked in", with the ability to change alarm setpoints disabled, except for authorized supervisory personnel. This action is pending the assistance of a computer technology contractor.

Water Quality Concerns: Mr. Thompson consulted with his supervisor, Mr. Vee Miller (Plant Engineer) and Mr. Razmik Manoukian (Treatment Manager) regarding this water quality event. In analyzing the trend data, we found the following:

1. Influent water quality and quantity were stable during the duration of the event. Operators noted no significant changes in treatability of the water during this time period.
2. Chemical use and residuals were stable, again indicating consistent water quality and treatability.
3. Flows, backwash frequency and headloss for Filter #12 closely mimic those of the other filters on that train, indicating no significant differences in either influent water quality or filter performance during this time period.
4. UV disinfection trends show a Cryptosporidium and Giardia inactivation of not less than 1.5log and 2.0 log removal respectively during this time period.
5. Turbidity readings for the remaining filters on Module #2, combined turbidity readings for Train #3, and a simplified mass-balance indicate that Filter #12's turbidity during this period did not exceed 0.30ntu. This indicates the filter performance parameters were met for Cryptosporidium, Giardia and virus removal on that filter.
6. The multiple barrier approach utilized at LAAFP, including filter operations, UV disinfection and chlorine disinfection provided an effective barrier against pathogens during this instrument failure and the water served to our customers was safe to drink.

Summary and Conclusion: On Friday, March 4, 2016, at approximately 00:15 hours, the Turbidimeter failed. Due to an erroneous set point, the DCS did not go into alarm. At approximately 13:15 hours a WTO noted an alarm signal on the Turbidimeter display and notified the CRO. The WTO collected a grab sample that registered 0.073 NTU. The Instrument Shop replaced a burnt out lightbulb within the Turbidimeter. During the outage, we failed to take sufficient grab samples and due to a communications issue failed to realize same.

During the investigation of this incident we found and corrected issues with the following:

- Clear communication regarding time and nature of failure is critical to proper response.
- Supervisory review of all unusual events at LAAFP and Field Stations.
- Setpoints for key water quality parameters need to be electronically secured to prevent improper changes to values.
- Overall plant performance and water quality parameters were stable.
- Multi-barrier pathogen inactivation helped us assure effluent compliance with regulations.

Water Operations Metro Report

Distribution Treatment

Event Date	Location	Reported By	Recorded By	Event Type	Status
04-MAR-2016 04:31:00	NORTH HOLLYWOOD WEST WELLS OSG	IFIX	SCOTT, TERRY	WATER TREATMENT	In Progress
<p>0425 called hector, no answer left message, north Hollywood west wells to chlorine residual free ac, called Jorge 0430 sending wto. alex, A responded and made the corrections. analyzer pump restarted per Jorge per alex. also notified Jorge of the stone canyon vault 4 chemscan ac trouble, will notify hector.</p>					
04-MAR-2016 04:07:00	MANHATTAN WELLS	IFIX	SCOTT, TERRY	CL2 RES. ALARM	In Progress
<p>2150 alex J, and joe ariza responded to manhattan high chlorine alarm, made some adjustments.</p>					

Treatment LAAPF

Event Date	Location	Reported By	Recorded By	Event Type	Status
04-MAR-2016 04:01:00	LOS ANGELES FILTRATION PLANT	DCS	SCOTT, TERRY	WATER TREATMENT	In Progress
<p>2200-0600 ts, rg, 18 filters, 8 uv's, 5 osb, #8 oos, plant flow: 336 mgd, C&E generators, ozone .19 mg/L, O2 @ 32 l/d, Railcar #3 @ 3900 #/da, @ 2.53 mg/L, virus 4.59:1, giardia 1.51:1, ct act 20.33 mg/L*min.</p>					

ATTACHMENT D

LAAFP Turbidity Alarm Setpoints, April 2016

LAAFP
Turbidity alarm setpoints for all filters, trains, plant effluent.

All filter effluent turbidity alarm setpoints are as follows:

- (1) Low alarm limit #1 (LL) at 0.010 NTU.
- (2) High alarm limit #1 (HL) at 0.200 NTU.
- (3) High alarm limit #2 at 0.250 NTU.
- (4) High alarm limit #3 at 0.300 NTU.
- (5) Low alarm dead band (DJ) at 0.02
- (6) High alarm dead band (DB) at 0.02

Trains #1-4 turbidity alarm setpoints are as follows:

- (1) Low alarm limit #1 (LL) at 0.010 NTU.
- (2) High alarm limit #1 (HL) at 0.150 NTU.
- (3) High alarm limit #2 at 0.200 NTU.
- (4) High alarm limit #3 at 0.300 NTU.
- (5) Low alarm dead band (DJ) at 0.001
- (6) High alarm dead band (DB) at 0.005

Effluent turbidity alarm setpoints are as follows:

- (1) Low alarm limit #1 (LL) at 0.010 NTU.
- (2) High alarm limit #1 (HL) at 0.150 NTU.
- (3) High alarm limit #2 at 0.200 NTU.
- (4) High alarm limit #3 at 0.300 NTU.
- (5) Low alarm dead band (DJ) at 0.001
- (6) High alarm dead band (DB) at 0.005

ATTACHMENT E

Form for Proof of Tier 3 Notification

PROOF OF NOTIFICATION

Name of Water System: **Los Angeles Department of Water and Power**

System Number: 1910167

**Certification of Notification for
Ground Water Rule Treatment Technique and Reporting Violations**

As required by *California Code of Regulations*, Title 22, Section 64463.7, *Tier 3 Public Notice*, I notified the users of the water supplied by the Los Angeles Department of Water and Power of the violation of Section 644655, Title 22, *California Code of Regulations*. I complied with the requirement to conduct public notification as indicated below:

<u>Required Action (indicate all that were used)</u>	<u>Date Completed</u>
Public Notification – Hand Delivery	<input type="text"/>
Public Notification - Mail Delivery	<input type="text"/>
Public Notification – Continuous Posting	<input type="text"/>
Public Notification - Consumer Confidence Report	<input type="text"/>
Public Notification - Other method Specify other method used: _____	<input type="text"/>

Signature of Water System Representative

Date

ATTACH A COPY OF THE NOTICE USED.

**THIS FORM MUST BE COMPLETED AND RETURNED TO
THE DIVISION OF DRINKING WATER**

ATTACHMENT F

Turbidimeter Recording Worksheet

*Complete checklist during the first hour of each shift.

Control Room: Filter, Turbidimeter, Chlorine analyzer checklist

LAAFP

Date and time: _____; _____
Data checked by: _____

LAAFP Filters: Module #1	Filter 1	Filter 2	Filter 3	Filter 4	Filter 5	Filter 6	Filter 7	Filter 8	Filter 9	Filter 10	Filter 11	Filter 12
DCS Flow (MGD) side A												
DCS Flow (MGD) side B												
DCS headloss side A												
DCS headloss side B												
<i>DCS Turbidity value (NTU)</i>												
<i>Local instrument Flow (MGD) side A (journeyman read)</i>												
<i>Local instrument Flow (MGD) side B (journeyman read)</i>												
<i>Local headloss side B (Journeyman Local turbidimeter reading by journeyman. Verify value with cro read. (ex: 0.055 NTU)</i>												

LAAFP Filters: Module #2	Filter 1	Filter 2	Filter 3	Filter 4	Filter 5	Filter 6	Filter 7	Filter 8	Filter 9	Filter 10	Filter 11	Filter 12
DCS Flow (MGD) side A												
DCS Flow (MGD) side B												
DCS headloss side A												
DCS headloss side B												
<i>DCS Turbidity value (NTU)</i>												
<i>Local instrument Flow (MGD) side A (journeyman read)</i>												
<i>Local instrument Flow (MGD) side B (journeyman read)</i>												
<i>Local headloss side B (Journeyman Local turbidimeter reading by journeyman. Verify value with cro read. (ex: 0.055 NTU)</i>												

Turbidity Data	Train	Train	Train	Train	Effluent (Low)	Effluent (High)
DCS Train & turbidimeter readings	1	2	3	4		
Local Train & Turbidimeter readings						

*Compare DCS versus local turbidity readings. Call inst. shop to check instruments as needed.

All online instrumentation (turbidimeters, chlorine residual analyzers, etc), have instrument techs perform calibration, repairs as needed.

