GAGE 46-1 WTP MODIFICATION AND DEVLOPMENT OF LONG TERM WATER TREATMENT APPROACHES – WORK ORDER NO. 2008392 IN THE TOTAL AMOUNT OF $850,000

Riverside Public Utilities – Water Division

Board of Public Utilities
October 28, 2019

BACKGROUND

RPU's Water Supply:

a. Local Groundwater Basins
b. Precipitation and recharge
c. Naturally filtered by gravels, sands and silts

BACKGROUND

Percolation adds trace minerals to groundwater:

a. Radionuclides
b. Arsenic
c. Hexavalent Chromium

BACKGROUND

Anthropogenic trace contaminants:

a. Perchlorate
b. TCE, 1,2,3-TCP
c. DBCP
d. Nitrates
e. PFAS, PFOA

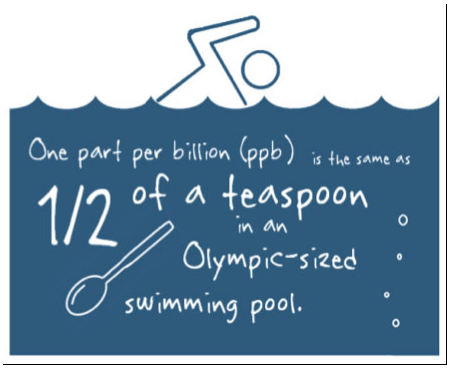
BACKGROUND

Units of Measure: Parts Per Million

a. 1 part per million (ppm) - one millionth of something or 0.0001%.
b. 1 ppm = 1 cent in $10,000
c. 1 inch in 16 miles
d. 1 minute in 2 years

BACKGROUND

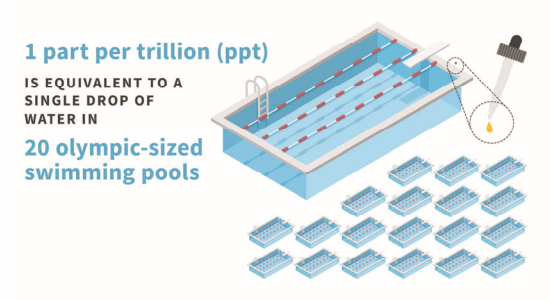
Units of Measure: Parts Per Billion



a. 1 part per billion (ppb) - one billionth of something or 0.0000001%
b. 1 cent in $10,000,000
c. 1 second in 32 years
d. 1 blade of grass in a football field

BACKGROUND

Units of Measure: Parts Per Trillion



a. 1 part per trillion (ppt) - 1 in 1,000,000,000,000
b. 1 grain of sugar in an Olympic-sized pool
c. 1 second in 320 centuries

BACKGROUND

PFOS/PFOA Timeline:

a. 2009 – EPA established provisional health advisories (HAs)
   i. PFOA at 400 ppt
   ii. PFOS at 200 ppt

b. 2013 - 2015 –UCMR3

c. May 2016 – Cal EPA health advisories
   i. 70 ppt for combined PFOS and PFOA

BACKGROUND

d. 2018 – DDW released notification and response levels:
   i. PFOA notification level 14 ppt
   ii. PFOS notification level 13 ppt
   iii. Response Level of 70 ppt for PFOA +PFOS

e. Feb 2019 – EPA announced the PFAS Action Plan

f. Mar 2019 – DDW orders:
   i. Wells within 2 miles of an airport or within1 mile of a landfill
   ii. 34 of 50

BACKGROUND

g. May 2019 –AB 756 signed
   i. Authorizes SWRCB to order monitoring for PFOS and PFOA substances.

h. Aug 2019 – DDW Reduced notification levels to:
   i. PFOS 6.5 ppt
   ii. PFOA 5.1 ppt

i. 2020 – Response levels are expected to be reduced (not confirmed)

BACKGROUND

Various states have established drinking water guidelines, including the following:

State	PFOA Guideline in µg/L	PFOS Guideline in µg/L
Delaware	0.4	0.2
Maine	0.13	0.56
Michigan	0.42	0.011
Minnesota	0.035	0.027
New Jersey	0.04	N/A
North Carolina	2	N/A
Texas	0.3	0.6
Vermont	0.02	N/A

BACKGROUND

RPU has treatment plants for reducing contaminants:

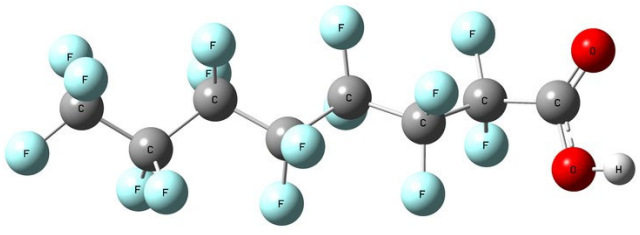
a. Filtration
   i. Manganese, Nitrates, TDS
b. Ion Exchange (IX) – Ionic resins (water softening)
   i. Perchlorate, TCE, 1,2,3-TCP
c. Granular Activated Carbon (GAC)– (Brita™)
   i. DBCP
d. Blending – regulatory limits met at compliance point
e. Chlorination/Disinfection

BACKGROUND

On August 12, 2019, the Water Committee received and filed an update on the California Protection Agency's action on chemical substances known as Perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS).

BACKGROUND

Perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) are human-made compounds that do not occur naturally in the environment



BACKGROUND

a. Repel oil and water

b. Used in a variety of industrial and consumer products, such as carpet and fabric treatments and firefighting foam

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BACKGROUND

c. Extremely persistent in the environment

d. Blood tests show detections in nearly all people tested

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BACKGROUND

Health Effects and MCL:

a. Readily absorbed after oral exposure. Accumulation in: blood, kidneys and liver;

b. Potential developmental, reproductive and systemic effects.

c. Health-based advisories or screening levels have been developed by EPA and state agencies.

d. EPA has not issued a Maximum Contaminant Level (MCL) for drinking water.

BACKGROUND

Common Sources:

a. Contamination associated in areas where chemicals were manufactured and/or used
   i. Military airfields for fire fighting operations
   ii. Industrial operations

b. Wastewater discharges

DISCUSSION

1. Source water: Detection in 34 of 50 wells

2. Compliance point: Below notification level

3. Winter blend – low flows create challenges

DISCUSSION

Options:

1. Treatment of the Gage Well 56-1
   i. $700K Capital, $210K Operating

2. No action – may need to notify

3. Imported Water
   i. $0K Capital, $1.6M to $3.0M Operating

DISCUSSION

Gage 56-1 Treatment:

1. Treatment of the Gage Well 56-1 through either
   i. Granular Activated Carbon (GAC)
   ii. Ion Exchange Resin (IX)

2. PRP agreed to allow RPU to utilize two empty vessels at Gage 46-1 WTP for use in treating Gage 56-1 Well

DISCUSSION

If no corrective action is taken immediately:

1. The concentrations of these chemicals may exceed Notification Levels, and

2. Public notification made to customers of the exceedance as part of the annual Consumer Confidence Reporting.

DISCUSSION

Strategies:

1. Monitor, identify sources, and potentially responsible parties
2. Research treatment options for short-term
   a. Treat flows produced from the Gage 56-1 well
3. Research treatment options for long-term
4. Collaborate with regulators and local agencies
5. Track all costs associated with PFOS/PFOA

DISCUSSION

Capital project expenditure breakdown

Capital Project Expenses Breakdown		
Work Type	**Performed By:**	**Amount ($)**
Planning and Design	RPU Staff	$55,000
Gage 56-1 Well Piping Modifications	RPU Water Field Forces	$345,000
IX Resin	Resin Vendor	$200,000
Construction Contingency		$100,000
Professional Services		
Development of Long-Term Treatment and Operational Approach	Consultant from Consultants Panel	$150,000
Work Order Total:		**$850,000**
Reimbursements		None
Anticipated Start Date:		**November 2019**
Anticipated Duration:		**2 months for Construction; 6 months for Treatment Approach**

DISCUSSION

Anticipated annual operation and maintenance costs

Annual Operating and Maintenance Expenses Breakdown		
Work Type	**Performed By:**	**Amount ($)**
Sampling and Monitoring (Nov-April)	RPU Staff	$8,000
Operations and Maintenance Costs	RPU Water Operations	$35,000
IX Resin (Assume 3-year cycle)	Resin Vendor	$67,000
Electrical Costs (Nov-April)	n/a	$100,000
Estimated Annual Operational Costs:		**$210,000**

RECOMMENDATIONS

That the Board of Public Utilities:

1. Approve Work Order No. 2008392 in the total amount of $850,000 for design, construction, and construction contingency costs for the Gage 46-1 Water Treatment Plant Modification Project; and
2. Authorize staff to utilize the Consultant's Panel to seek a professional services agreement to investigate and develop a long-term water treatment and operational approach to reduce concentrations of chemical substances known as perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) for a not to exceed amount of $150,000.