



PORT ORANGE CITY COUNCIL WORKSHOP

Council Chambers

1000 City Center Circle, City Hall

Tuesday, November 17, 2015 @ 6:30 PM

WORKSHOP AGENDA

Pursuant to Section 3.06 of the Charter of the City of Port Orange, the Mayor has called a **Workshop** of the City Council to be held for the following purposes:

OPENING

1. Pledge of Allegiance
2. Silent Invocation
3. Roll Call
4. Rules of Procedure

DISCUSSION ITEMS:

5. Fluoride Discussion
6. Time and Attendance Presentation
7. Community Development Block Grant (CDBG) Presentation
8. Inflow & Infiltration(I&I) Study Results
9. Water Audit/Status of Meter replacement Program

ADJOURNMENT

ANY PERSON WHO DECIDES TO APPEAL ANY DECISION MADE BY THE CITY COUNCIL WILL NEED A RECORD OF THE PROCEEDINGS, AND FOR SUCH PURPOSE HE OR SHE MAY NEED TO ENSURE AT HIS OR HER OWN EXPENSE FOR THE TAKING AND PREPARATION OF A VERBATIM RECORD OF ALL TESTIMONY AND EVIDENCE OF THE PROCEEDINGS UPON WHICH THE APPEAL IS TO BE BASED.

NOTE: IF YOU ARE A PERSON WITH A DISABILITY WHO NEEDS ANY ACCOMMODATION IN ORDER TO PARTICIPATE IN THIS PROCEEDING, YOU ARE ENTITLED, AT NO COST TO YOU, TO THE PROVISION OF CERTAIN ASSISTANCE. PLEASE CONTACT THE CITY CLERK FOR THE CITY OF PORT ORANGE, 1000 CITY CENTER CIRCLE, PORT ORANGE, FLORIDA 32129, TELEPHONE NUMBER 386-506-5563, WITHIN 2 WORKING DAYS OF YOUR RECEIPT OF THIS NOTICE OR 5 DAYS PRIOR TO THE MEETING DATE; IF YOU ARE HEARING OR VOICE IMPAIRED, CONTACT THE RELAY OPERATOR AT 1-800-955-8771.

Dr. Paul Connett's bio.

Dr. Paul Connett is a graduate of Cambridge University and holds a Ph.D. in chemistry from Dartmouth College. Since 1983 he taught chemistry at St. Lawrence University in Canton, NY where he specialized in Environmental Chemistry and Toxicology. He retired in May 2006.

Paul Connett has researched the literature on fluoride's toxicity and the fluoridation debate for 20 years. He helped found the Fluoride Action Network (FAN) see <http://www.fluorideACTION.net>. He has given invited presentations on the dangers of fluoridation to legislative and research bodies and local communities in Australia, Canada, Germany, Ireland, Israel, Japan, New Zealand, the UK and the US. This has included invited presentations in 2003 to both the US EPA and the US National Research Council.

In 2010, with two other authors he published the book, *The Case Against Fluoride* (Chelsea Green), which contains 80 pages of citations to the scientific literature. As of November 2015 there has yet to be a scientifically referenced response to this book.

Despite being challenged many times to do so, very few of those championing fluoridation in government agencies and professional bodies, have been prepared to publicly debate professor Connett on fluoridation.

In addition to his work on fluoride Paul Connett has worked on waste management. Since 1985 this has taken him to 64 countries, where he has give over 2500 pro bono presentations to communities. His work on waste has been summarized in a book published in 2013, *The Zero Waste Solution: Untrashing the Planet One Community at a Time* (Chelsea Green, 2013).

Why We Should End Fluoridation

Paul Connett, PhD

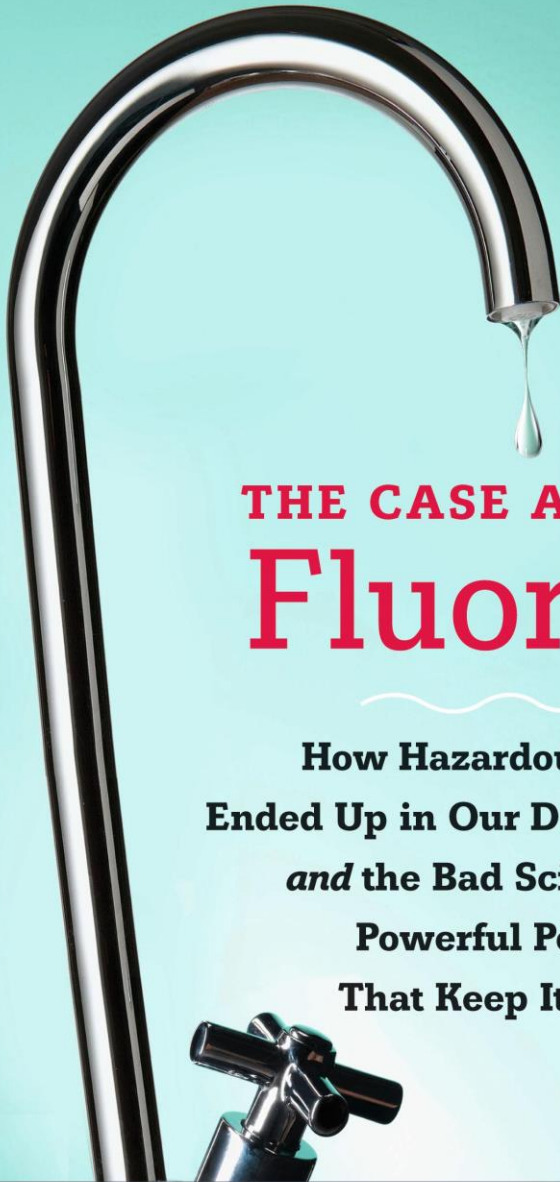
Director, Fluoride Action Network

FluorideALERT.org

Port Orange, Florida, Nov 17, 2015

Personal introduction

- I have spent the last 20 years fighting **water fluoridation** first as a professor of chemistry specializing in **environmental chemistry and toxicology**, and until recently as director of the **Fluoride Action Network**.
- This research effort culminated in the publication of ***The Case Against Fluoride*** in Oct, 2010.



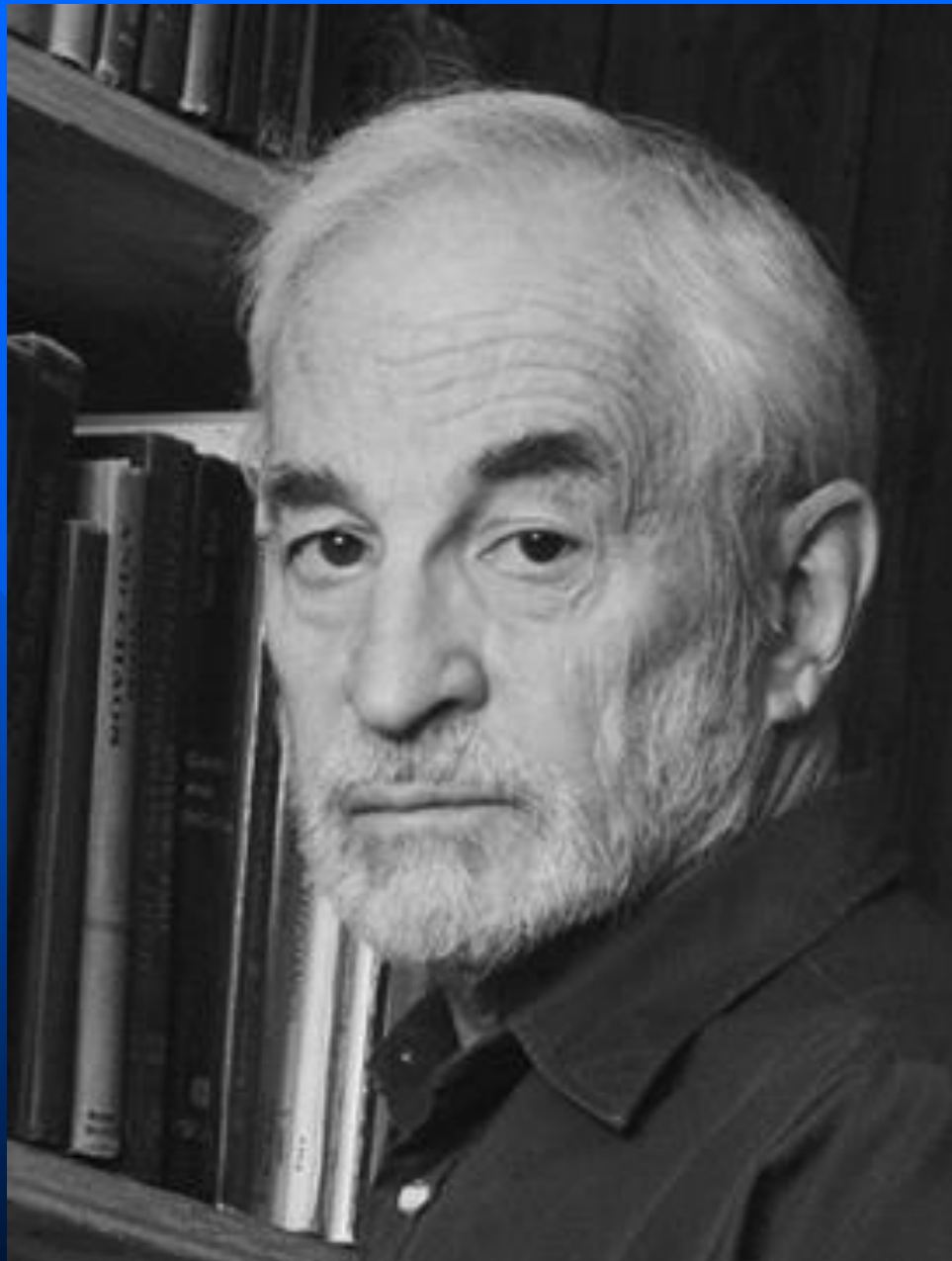
.....
**A New Look
at the Scientific
Evidence**
.....

THE CASE AGAINST Fluoride

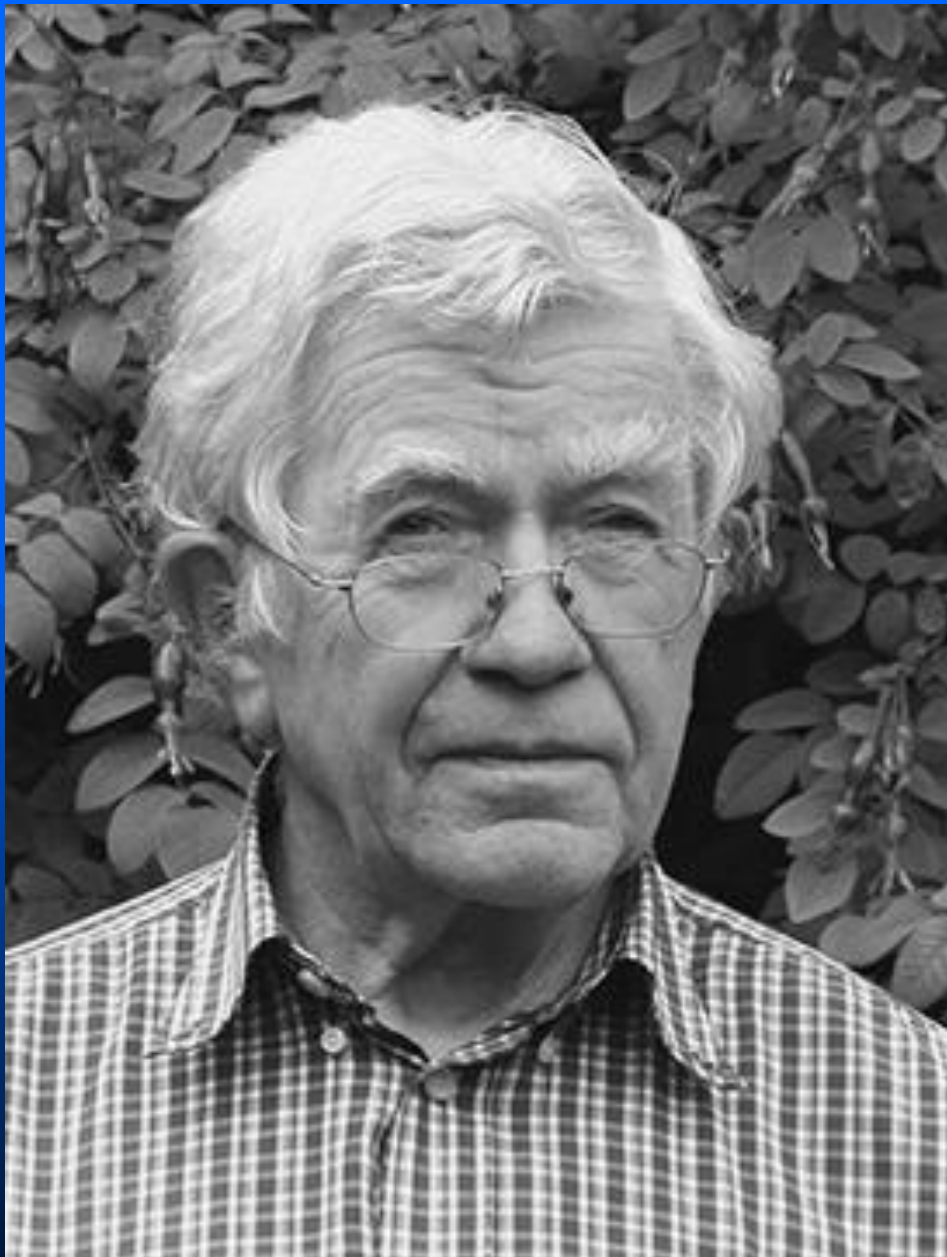
**How Hazardous Waste
Ended Up in Our Drinking Water
and the Bad Science and
Powerful Politics
That Keep It There**

PAUL CONNETT, PhD

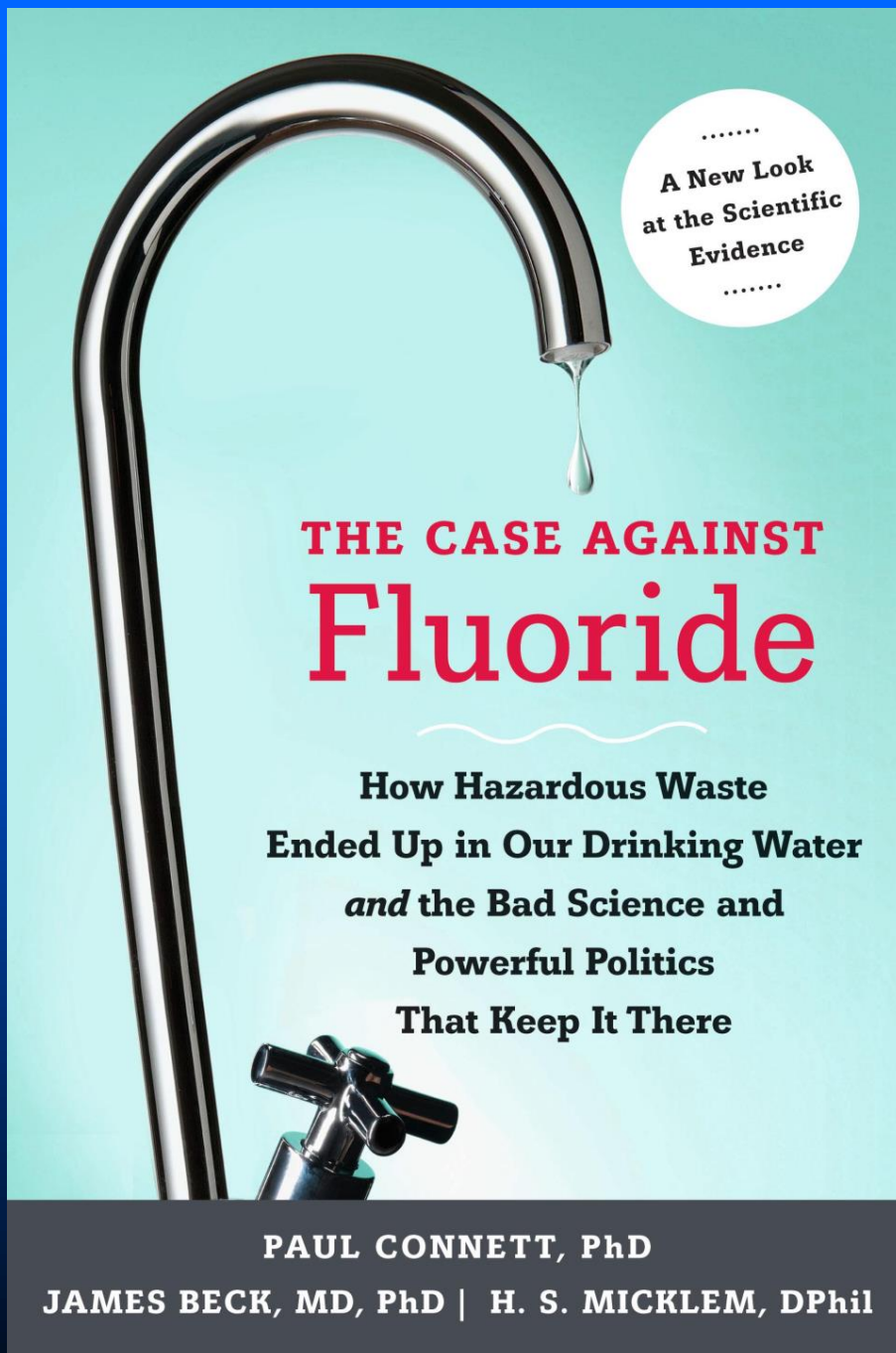
JAMES BECK, MD, PhD | H. S. MICKLEM, DPhil



James Beck, MD, PhD, retired professor of Physics from Calgary



HS Micklem, D Phil (Oxon), retired professor of Biology from Edinburgh



Book published
by Chelsea Green

October, 2010

Can be ordered
on Amazon.com

Contains
80 pages
of references
to the
Scientific
literature

Outline of my presentation

1. Better ways of fighting tooth decay in low-income families (e.g. Childsmile, Scotland).
2. Fluoridation is a poor medical practice.
3. Facts about fluorine, fluoride and nature's protection of the baby.
4. Our children are being over-exposed to fluoride
5. Fluoride is NEUROTOXIC
6. The evidence of benefit is surprisingly weak.
7. Fluoride's benefit (if any) is predominantly TOPICAL
8. Summary

1. Better ways of fighting tooth decay

Scotland

- Instead of water fluoridation, the Scottish Government has a **ChildSmile** program, which:
 - a) teaches toothbrushing in nursery-schools;
 - b) provides healthy snacks & drinks in school;
 - c) provides dental health and dietary advice to both children and parents, and
 - d) provides annual dental check-ups and treatment if required including fluoride varnish applications.

ChildSmile results

- The proportion of children aged 4–6 years without obvious dental decay has risen from **42% in 1996** to **67% in 2012**.
- The proportion of children aged 10–12 years without obvious dental decay rose from
- **53% in 2005** to **73% in 2013**

(Information Services Division Scotland, 2013).

ChildSmile Cost savings

- *“Glasgow researchers found that the scheme had reduced the cost of treating dental disease in five-year-olds by more than half between 2001 and 2010.” (BBC, Scotland)*

- In short our kids need
- MORE BRUSHING!
- MORE FRUIT AND VEGETABLES!
- LESS SUGAR!
- Less sugar means less tooth decay and less OBESITY
- Less obesity means less diabetes and fewer heart attacks
- In other words education to promote less sugar consumption is a very good investment!

We need
EDUCATION
not FLUORIDATION
to fight tooth decay and
obesity.

2. Fluoridation is
a poor medical
practice

We should NEVER use the public water supply to deliver ANY medical treatment

- a) You can't control the DOSE;
- b) You can't control who gets the treatment **AND**
- c) It violates the individual's right to informed consent to medication

3. Facts about Fluorine and Fluoride

1. Fluorine is the 13th most abundant element in the earth's crust
2. It does not occur as the free element because it is extremely reactive
3. It only occurs as compounds with other elements – these are called
FLUORIDES

4. Metallic fluorides (e.g. NaF, CaF_2 etc) release free fluoride ions F^- when they dissolve in water.

5. The level of fluoride that “naturally” occurs in some water supplies is a function of GEOLOGY not NATURE (The rocks came first and biology came after).

6. The average level of the fluoride ion in the oceans is 1.4 ppm.

7. Despite its abundance nature has found very little use for the fluoride ion in biology

8. In mammals not one single molecule (protein, fat, nucleic acid, carbohydrate or metabolite) contains fluorine and

9. not one single biochemical process has been shown to need fluoride ions to function properly

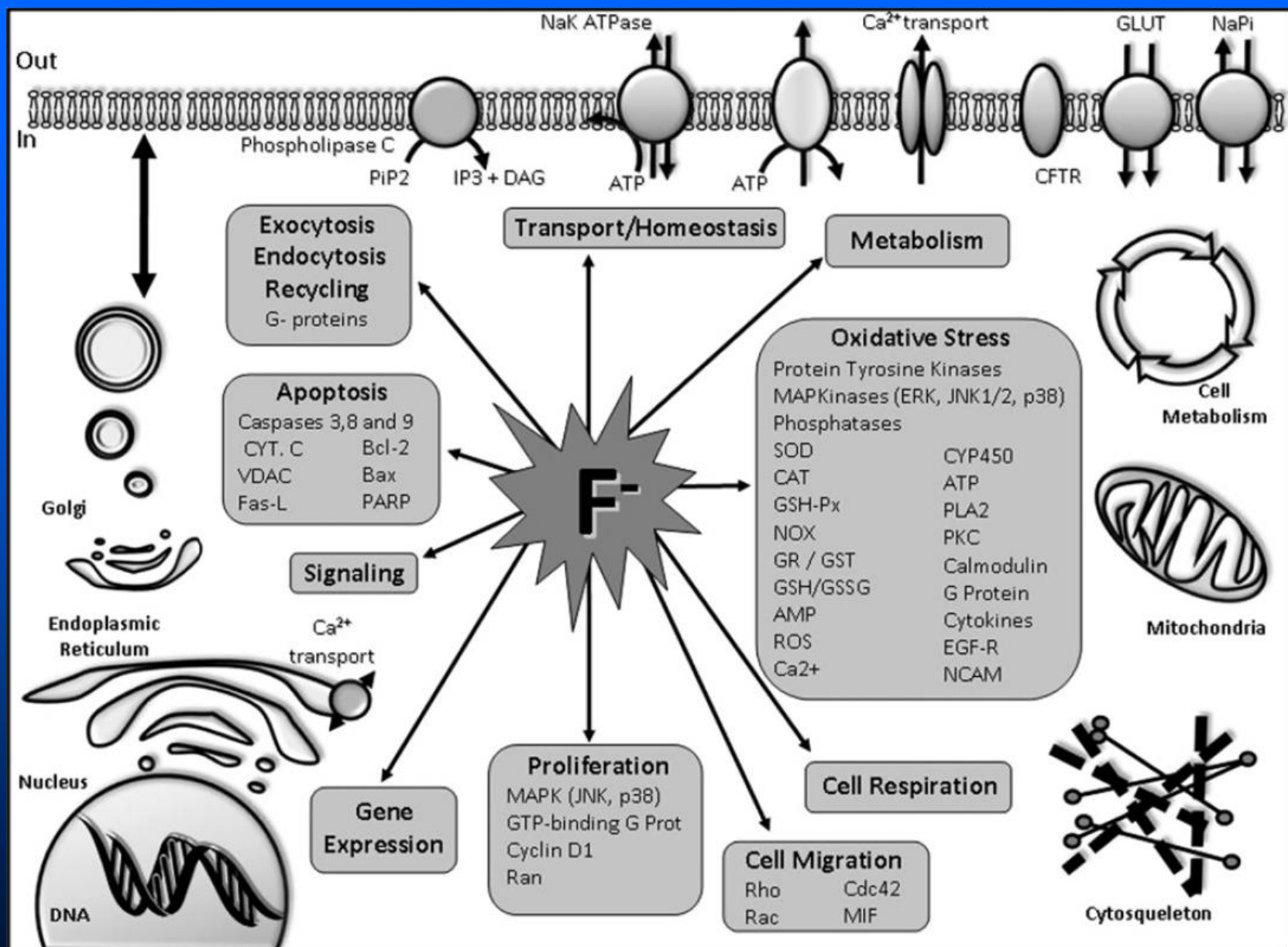
10. In other words fluoride is NOT AN ESSENTIAL NUTRIENT.

11. On the other hand, many biochemical molecules and processes are harmed by fluoride.

12. Fluoride is HIGHLY TOXIC.

13. See **Barbier et al, (2010). Molecular mechanisms of fluoride toxicity. *Chem. Biol. Interact.* 188(2):319-333.**

Fluoride's effects on human cells

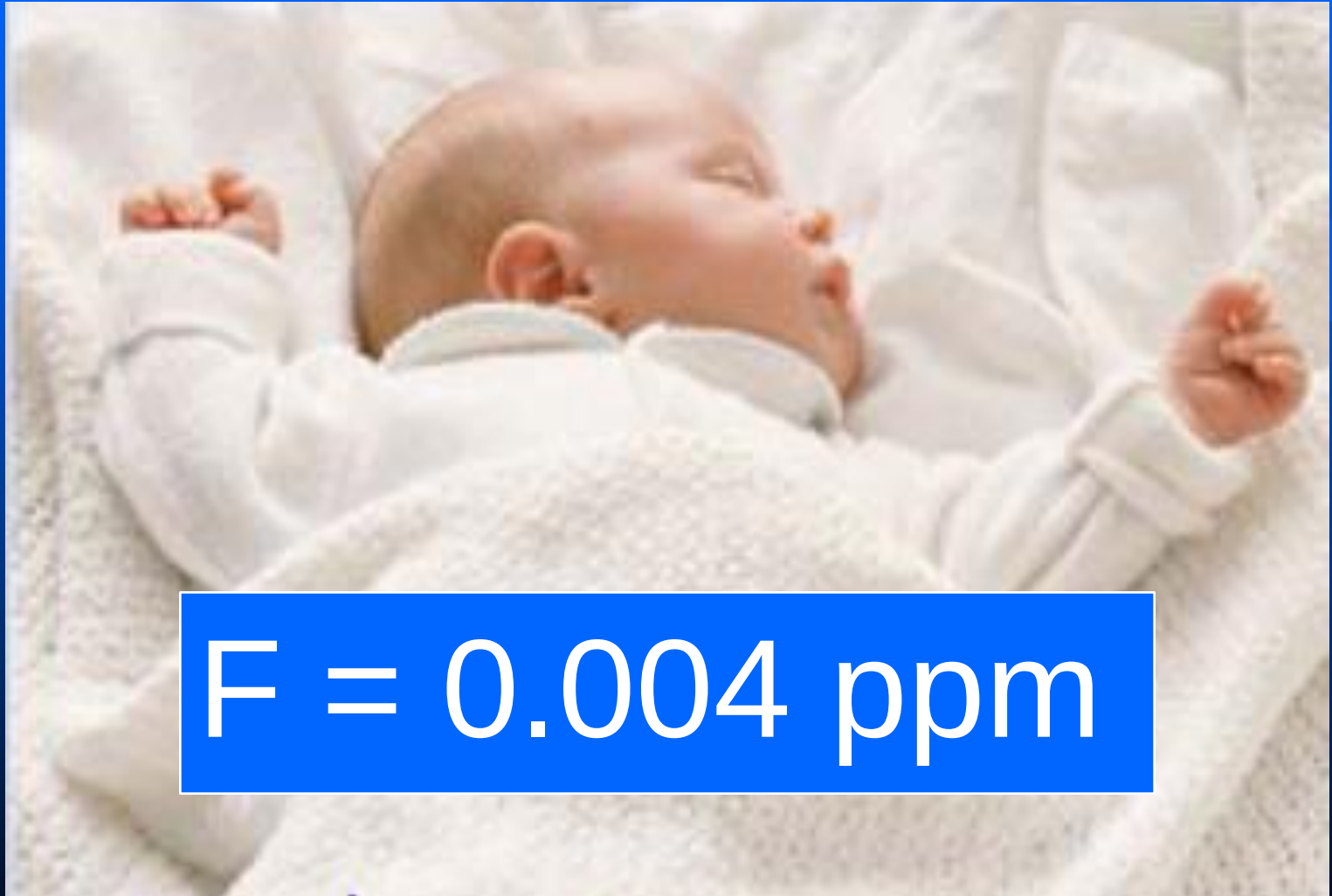


Barbier O, Arreola-Mendoza L, Del Razo LM.

Molecular mechanisms of fluoride toxicity. Chem Biol Interact. 2010 Nov 5; 188(2):319-33

In my view, it is no accident
that the level of fluoride in
mothers' milk is
EXTREMELY LOW

Mothers' milk protects our babies from early exposure to fluoride



$F = 0.004 \text{ ppm}$

Water fluoridation removes
nature's protection when babies are
bottle-fed with fluoridated water



$F = 0.7 \text{ ppm}$
175 x level in mothers' milk

4. Our children
Are being
over-exposed
to Fluoride

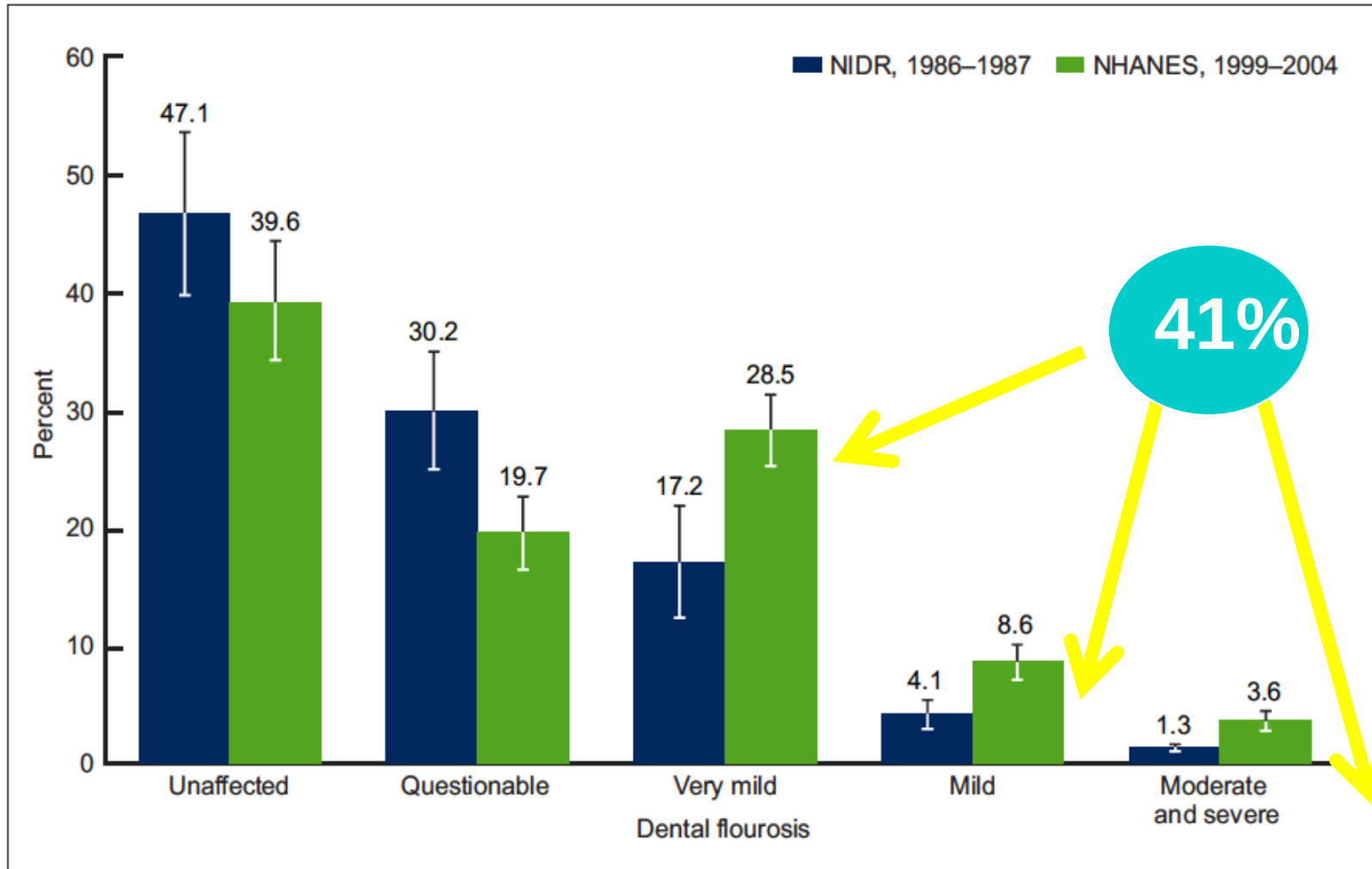
CDC (2010)

**41% of ALL American children
aged 12-15 had dental fluorosis**

**Beltrán-Aguilar et al. Prevalence and Severity of Dental
Fluorosis in the United States, 1999-2004**

CDC, 2010

Figure 3. Change in dental fluorosis prevalence among children aged 12–15 participating in two national surveys: United States, 1986–1987 and 1999–2004



NOTES: Dental fluorosis is defined as having very mild, mild, moderate, or severe forms and is based on Dean's Fluorosis Index. Percentages do not sum to 100 due to rounding. Error bars represent 95% confidence intervals.

SOURCES: CDC/NCHS, National Health and Nutrition Examination Survey, 1999–2004 and National Institute of Dental Research, National Survey of Oral Health in U.S. School Children, 1986–1987.

Impacts up to 50% of tooth surface



**Mild Dental Fluorosis
Affects 8.6% of US teens**

Impacts 100% of tooth surface



**Moderate-Severe Dental Fluorosis
Affects 3.6% of American teens**

It would be reckless to assume that when fluoride is damaging the baby's growing tooth cells it is not damaging other developing tissues.

5. Fluoride is
NEUROTOXIC

See

www.FluorideACTION.net/issues/health/brain

Fluoride's Neurotoxicity

- FAN has identified 314 studies that have investigated fluoride's effects on the brain and nervous system. This includes 181 animal studies, 112 human studies, and 21 cell studies.
- The majority of these studies were published subsequent to the NRC's 2006 review, including 124 animal studies, 63 human studies, and 12 cell studies.

The **animal studies** indicate that fluoride can enter the brain and change brain chemistry and some at very low levels (e.g. Varner et al, 1998)

34 out of 36 Animal Studies Have Found Fluoride Impairs Learning/Memory



IQ studies – the current tally

- **49** out of **56** studies have found an association between fairly modest exposure to fluoride and lowered IQ (China, India, Mexico and Iran)

The Harvard Meta-analysis

- In 2012, Choi et al (the team included Philippe Grandjean) published a meta-analysis of 27 studies comparing IQ in “high” versus “low” fluoride villages

Harvard Meta-analysis of IQ studies

Review

Developmental Fluoride Neurotoxicity: A Systematic Review and Meta-Analysis

Anna L. Choi,¹ Guifan Sun,² Ying Zhang,³ and Philippe Grandjean^{1,4}

¹Department of Environmental Health, Harvard School of Public Health, Boston, Massachusetts, USA; ²School of Public Health, China Medical University, Shenyang, China; ³School of Stomatology, China Medical University, Shenyang, China; ⁴Institute of Public Health, University of Southern Denmark, Odense, Denmark

BACKGROUND: Although fluoride may cause neurotoxicity in animal models and acute fluoride poisoning causes neurotoxicity in adults, very little is known of its effects on children's neurodevelopment.

OBJECTIVE: We performed a systematic review and meta-analysis of published studies to investigate the effects of increased fluoride exposure and delayed neurobehavioral development.

METHODS: We searched the MEDLINE, EMBASE, Water Resources Abstracts, and TOXNET databases through 2011 for eligible studies. We also searched the China National Knowledge Infrastructure (CNKI) database, because many studies on fluoride neurotoxicity have been published in Chinese journals only. In total, we identified 27 eligible epidemiological studies with high and reference exposures, end points of IQ scores, or related cognitive function measures with means and variances for the two exposure groups. Using random-effects models, we estimated the standardized mean difference between exposed and reference groups across all studies. We conducted sensitivity analyses restricted to studies using the same outcome assessment and having drinking-

Registry 2003). Fluoride exposure to the developing brain, which is much more susceptible to injury caused by toxicants than is the mature brain, may possibly lead to permanent damage (Grandjean and Landrigan 2006). In response to the recommendation of the NRC (2006), the U.S. Department of Health and Human Services (DHHS) and the U.S. EPA recently announced that DHHS is proposing to change the recommended level of fluoride in drinking water to 0.7 mg/L from the currently recommended range of 0.7–1.2 mg/L, and the U.S. EPA is reviewing the maximum amount of

Environmental Health Perspectives,
2012 Oct;120(10):1362-8.

Harvard meta-analysis of 27 studies

- The Harvard team acknowledged that there were weaknesses in many of the studies, however, **they stressed that the results were remarkably consistent**
- In ***26 of the 27 studies*** average IQ in the “high fluoride” village was lowered by **about 7 IQ points**

Fluoridation proponents have argued that the concentrations in the “high” fluoride villages were not relevant to water fluoridation in the US.

They are wrong!

Author/year

ppm in High F village

Chen 1991	4.55
Lin 1991	0.88
An 1992	2.1 – 7.6 (mean = 4.9)
Xu 1994	1.8
Yang 1994	2.97
Li 1995	1.81 – 2.69 (mean = 2.25)
Yao 1996	2 – 11 (mean = 6.5)
Zhao 1996	4.12
Yao 1997	2
Lu 2000	3.15
Hang 2001	2.90
Wang 2001	2.97
Xiang 2003	0.57 – 4.5 (mean = 2.54)
Seraj 2006	2.5
Wang 2006	5.44 +/- 3.88 (1.52 – 9.32)
Fan 2007	1.14 - 6.09 (mean = 3.62)
Wang 2007	3.8 – 11.5 (mean = 7.65)
Li 2010	2.47 +/- 0.75 (1.72 – 3.22)
Poureslami 2011	2.38
Wang 1996	>1- 8.6 (mean = 4.8)

Mean of 20 results (using means) = $70.49 / 20 = 3.52$

Taken from Choi et al, 2012 – Table 1, pp 24-26.

- The mean fluoride concentration in these 20 studies is LOWER than the US EPA's safe drinking water standard (4 ppm)
- And, in several studies the High F village is less than 3 ppm

IQ studies with water F concentration below 3 mg/L in "higher F group", and with statistically significant results

Study	IQ point difference	Water F concentration "high F group" (mg/L)
Xu et al. 1994	-14.0	1.8
Yao et al. 1997	-6.5	2
Hong et al. 2001	-6.6	2.90
Seraj et al. 2006	-13.4	2.5
Poureslami et al. 2011	-6.2	2.38

More details on one
of the IQ studies

Xiang et al. (2003 a,b)

- Compared IQ of children in two villages:
- Low Fluoride Village Average F in well water = **0.36 ppm** (Range = 0.18 -0.76 ppm)
- High Fluoride Village Average F in well water = **2.5 ppm** (Range 0.57 – 4.5 ppm)
- **Controlled for lead exposure** and **iodine intake**, and retrospectively for **arsenic**
- Found a drop of 5-10 IQ points across the whole age range between the two villages

Xiang et al. (2003 a,b)

MALES

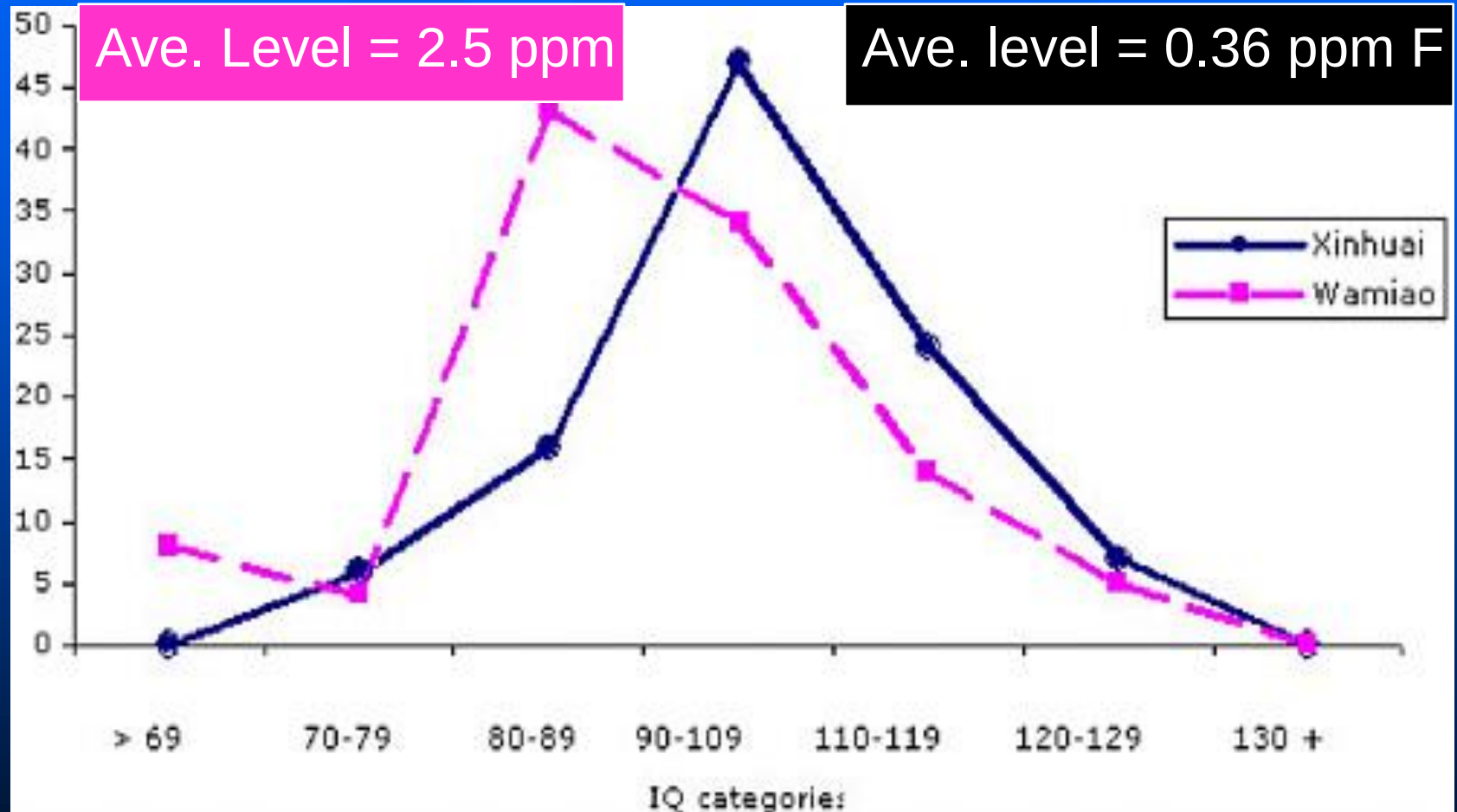


Table 8. Level of fluoride in drinking water and children's IQs

Village	F in drinking water (mg/L)		IQ and rate of retardation			
	Group	No. sample	Water F level (Mean±SD)	No. children	IQ (Mean±SD)	Rate of IQ<80 (%)
Xinhuai Wamiao	F	290	0.36±0.15	290	100.41±13.21	6.55
	A	9	0.75±0.14	9	99.56±14.13	0.00
	B	42	1.53±0.27	42	95.21±12.22*	9.52
	C	111	2.46±0.30	111	92.19±12.98 [†]	14.41*
	D	52	3.28±0.25	52	89.88±11.98 [†]	21.15 [†]
	E	8	4.16±0.22	8	78.38±12.68 [†]	37.50 [†]

* $p < 0.05$. [†] $p < 0.01$ compared with group F.

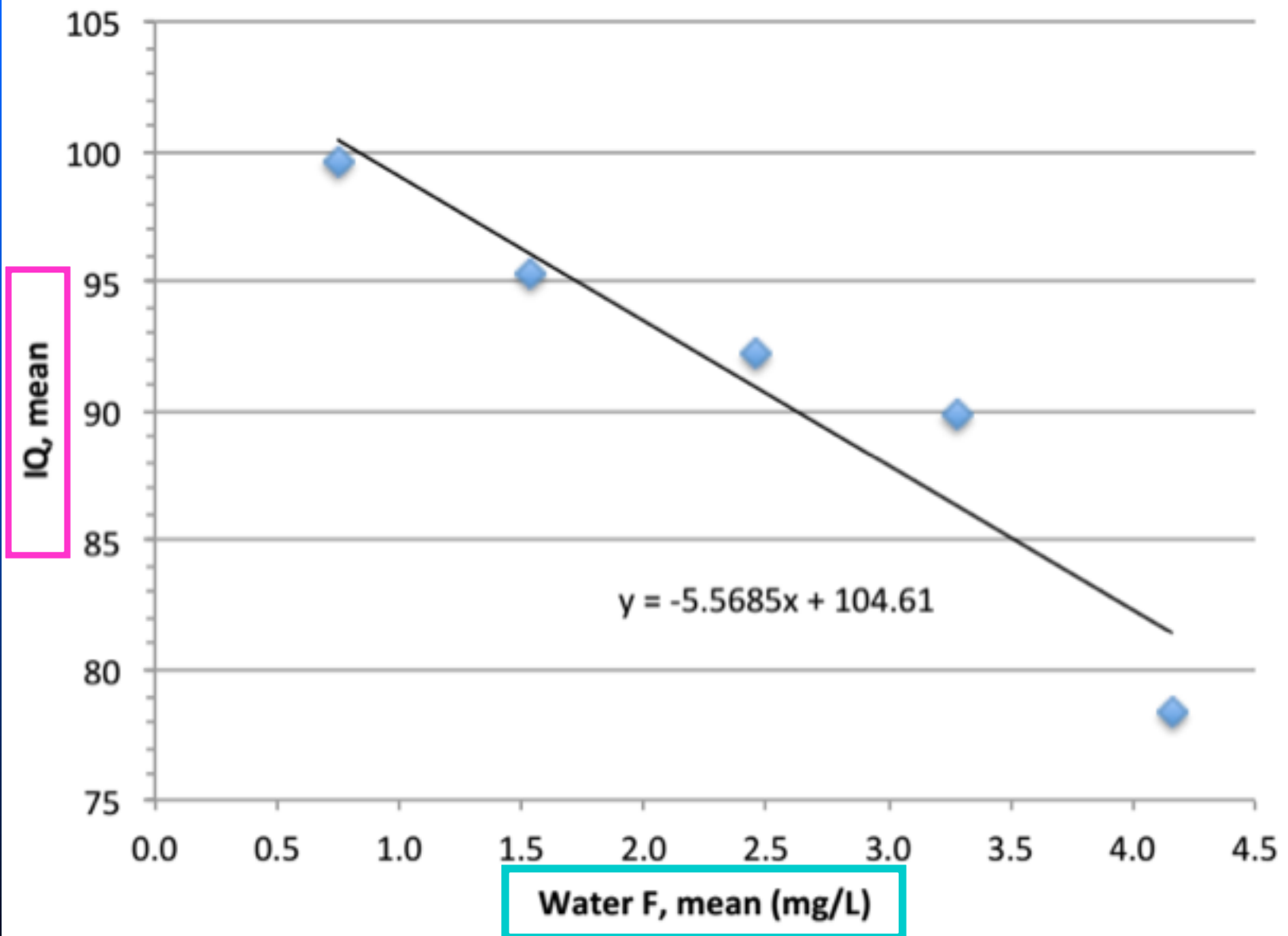
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IQ vs Water F

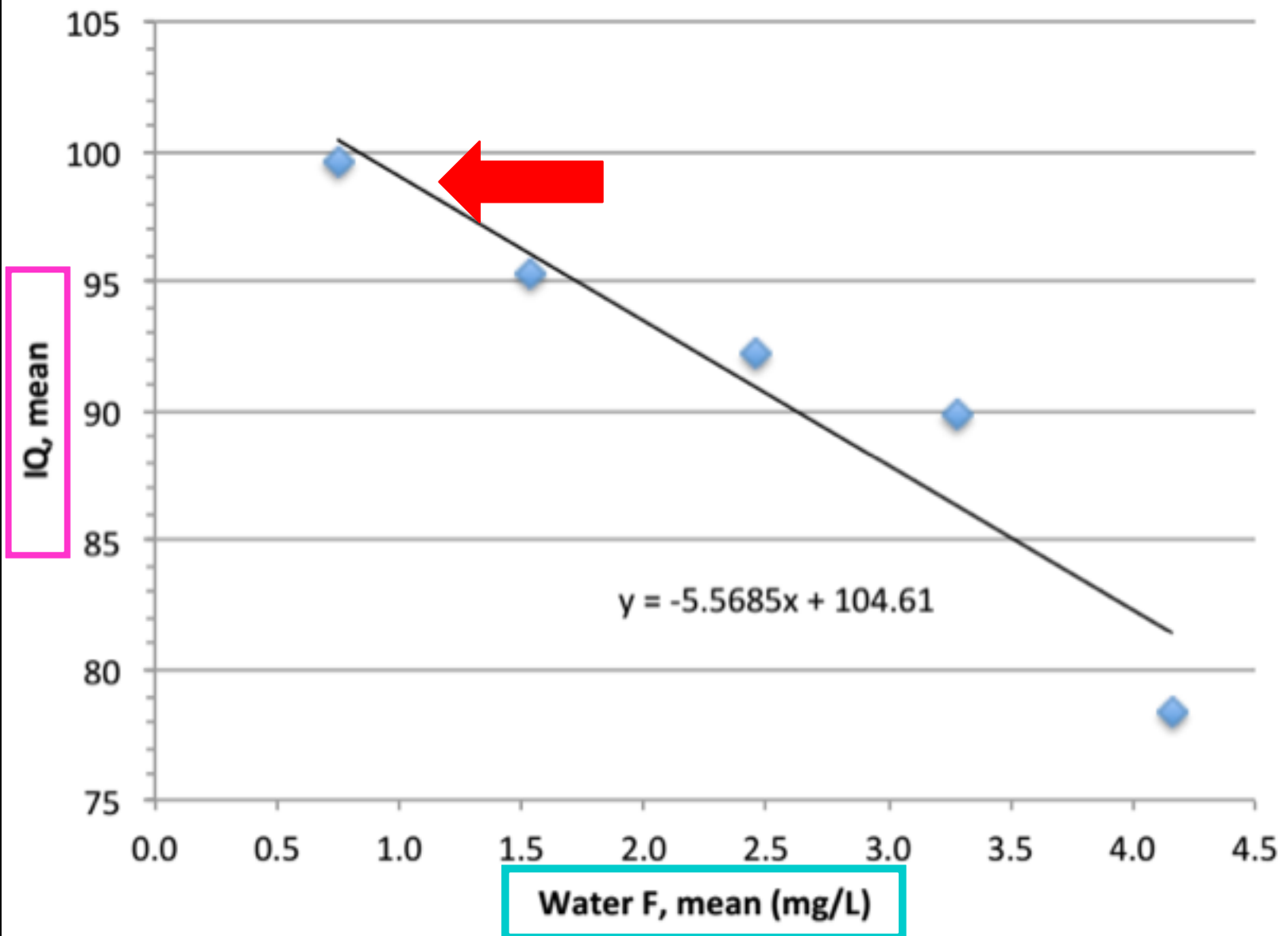
(for "high F" village Waimao, grouped by water F category)



This data would suggest that IQ is lowered somewhere between 0.75 and 1.5 ppm

IQ vs Water F

(for "high F" village Waimao, grouped by water F category)



In two respects these Chinese children had LESS exposure from other sources than North American children: 1) they were probably breast-fed not bottle-fed and 2) they didn't use fluoridated toothpaste

There is certainly NO MARGIN
OF SAFETY to protect the
brains of ALL children exposed
to a combination of water
fluoridation and other sources.

The very last children
who need a loss of IQ
points are children from
low-income families, who
are precisely the children
targeted in water
fluoridation programs!

3 QUESTIONS for PROPONENTS

1) What **primary studies** can you cite that allow you to *confidently* ignore *all* the evidence of fluoride's neurotoxicity cited by FAN (**181 animal studies, 112 human studies, and 21 cell studies**)?

See

www.FluorideACTION.net/issues/health/brain

2) How can you justify putting a neurotoxic substance into the drinking water of millions of children?

3) How can you claim that fluoridation is “safe” when there is NO MARGIN OF SAFETY to protect *ALL* our children from lowered IQ?

A question for
all citizens,
professionals
and decision
makers

 CLEARCHANNEL

FLUORIDEACTION.NET

 Healthy Water NW

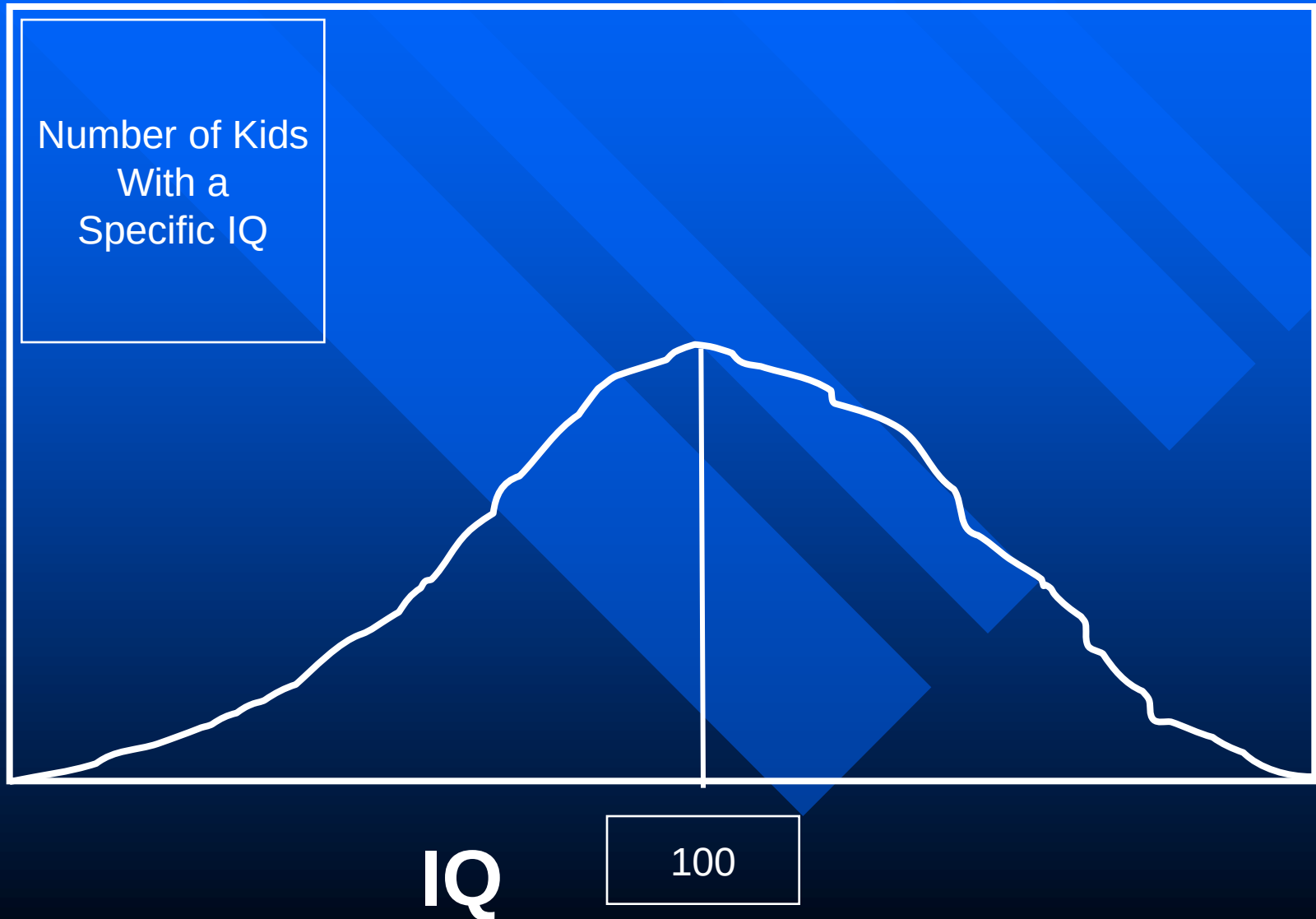
Do you really want her
drinking a neurotoxic
chemical?



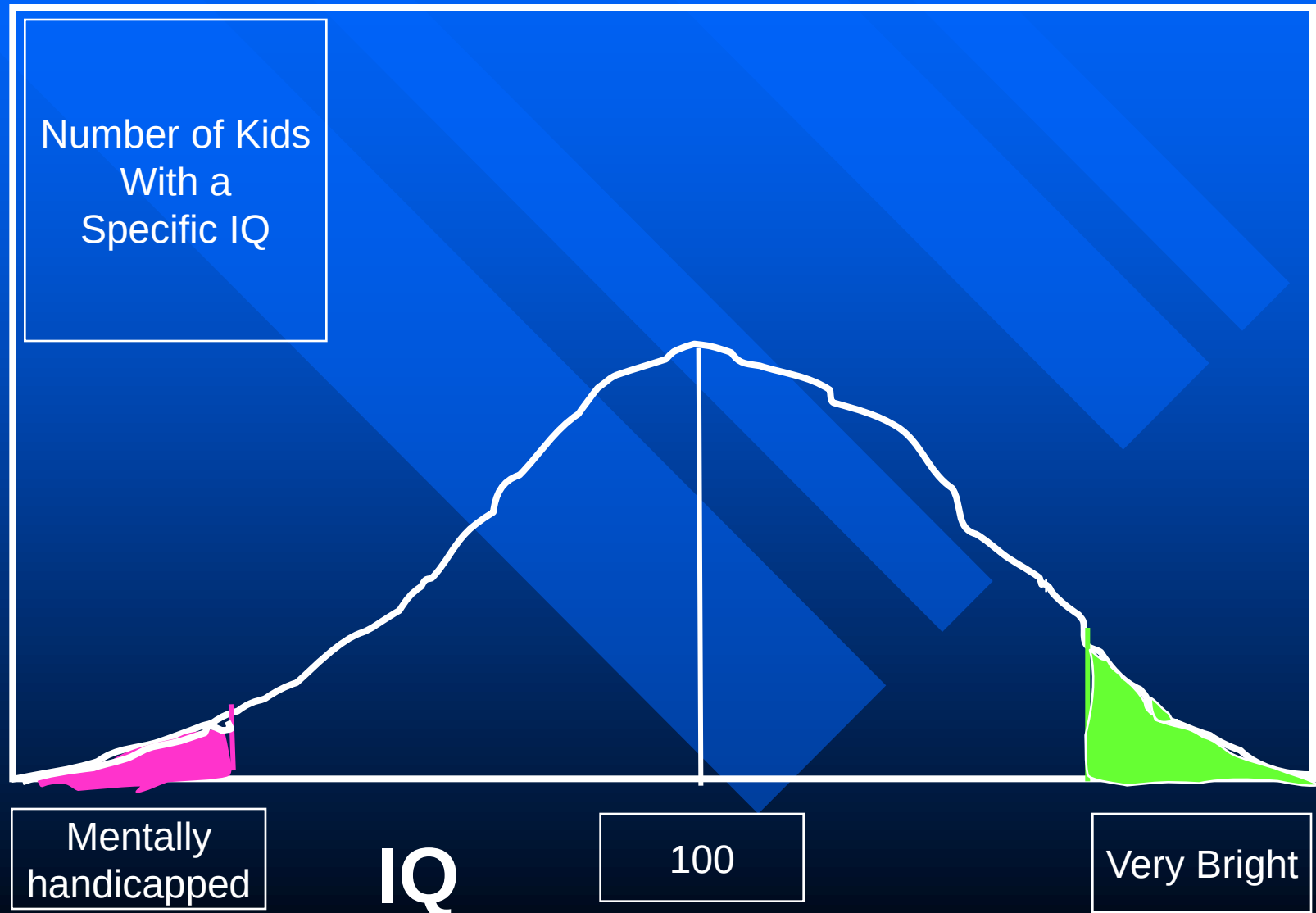
STOP ARTIFICIAL WATER FLUORIDATION

At the individual level this is
Russian roulette at the
population level it is more
predictable.

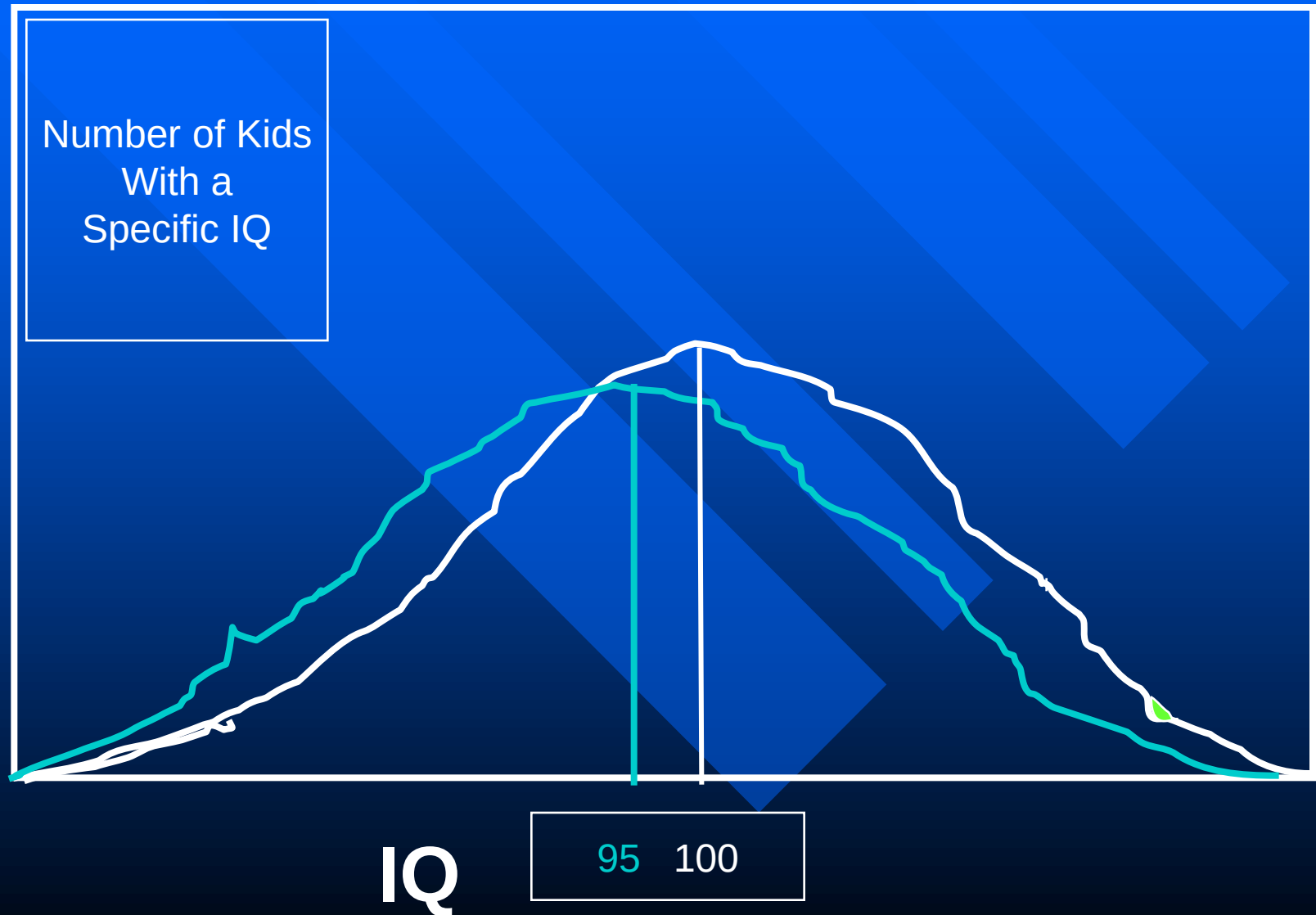
IQ and population



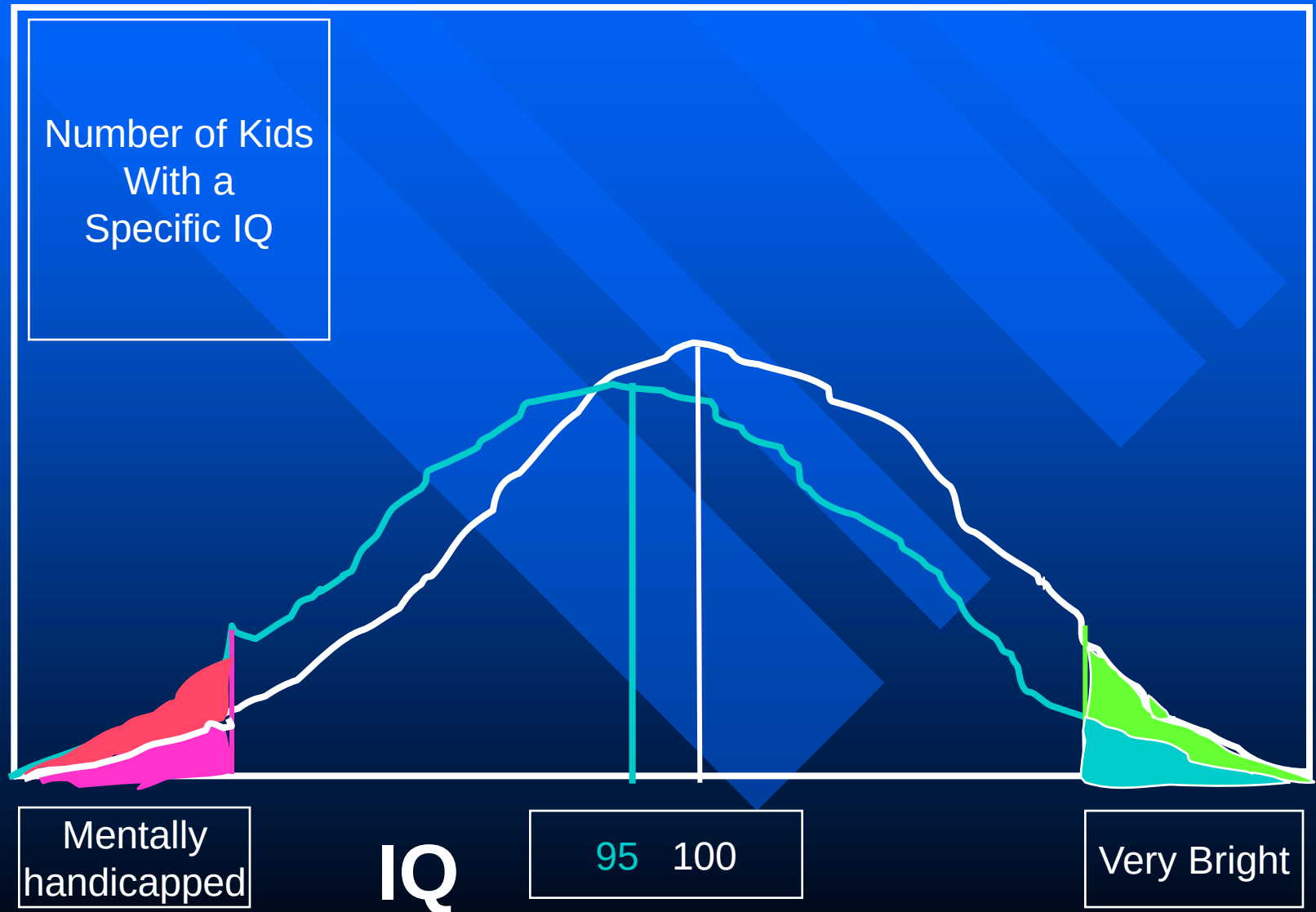
IQ and population



IQ and population



IQ and population



Xiang et al. (2003 a,b)

MALES

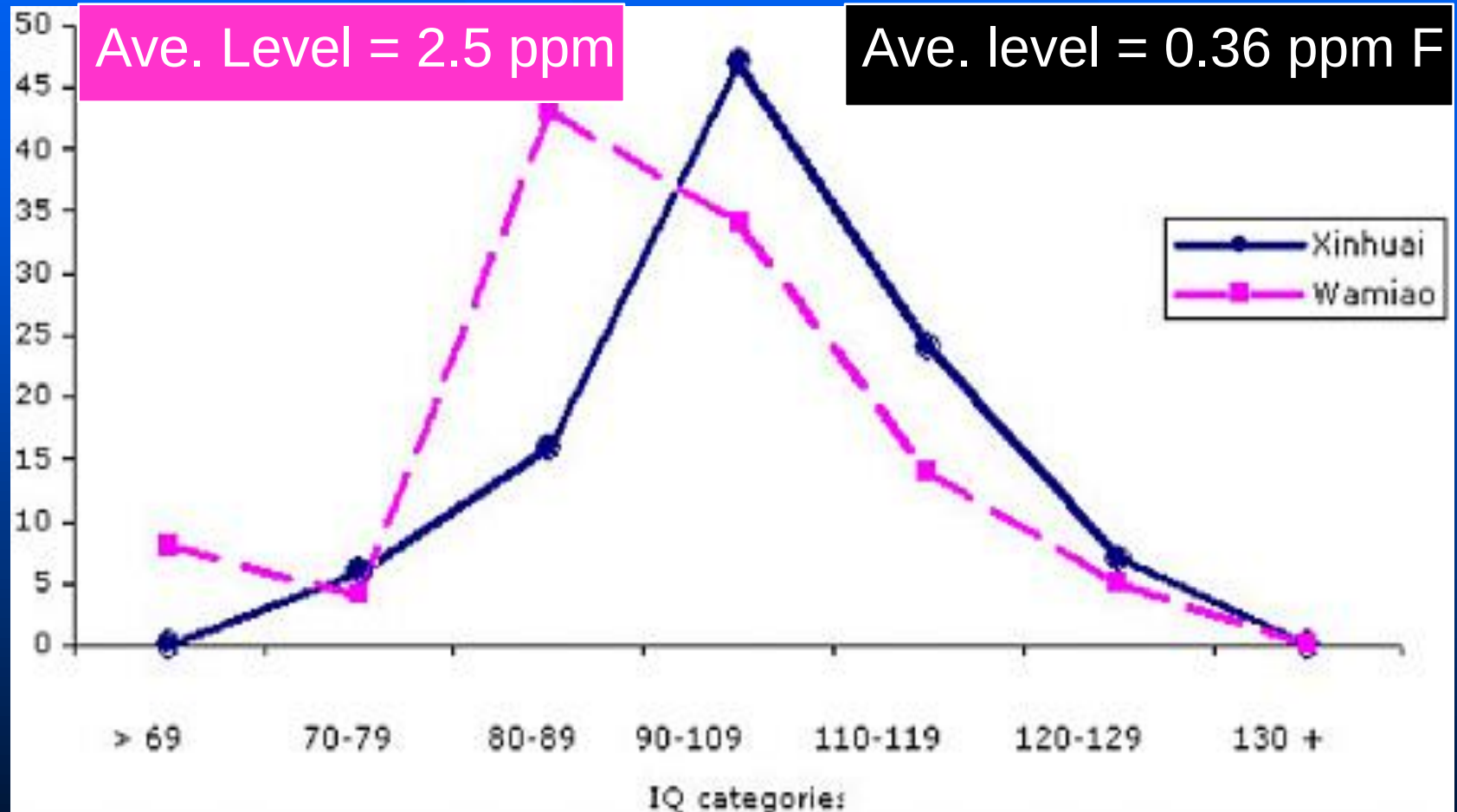


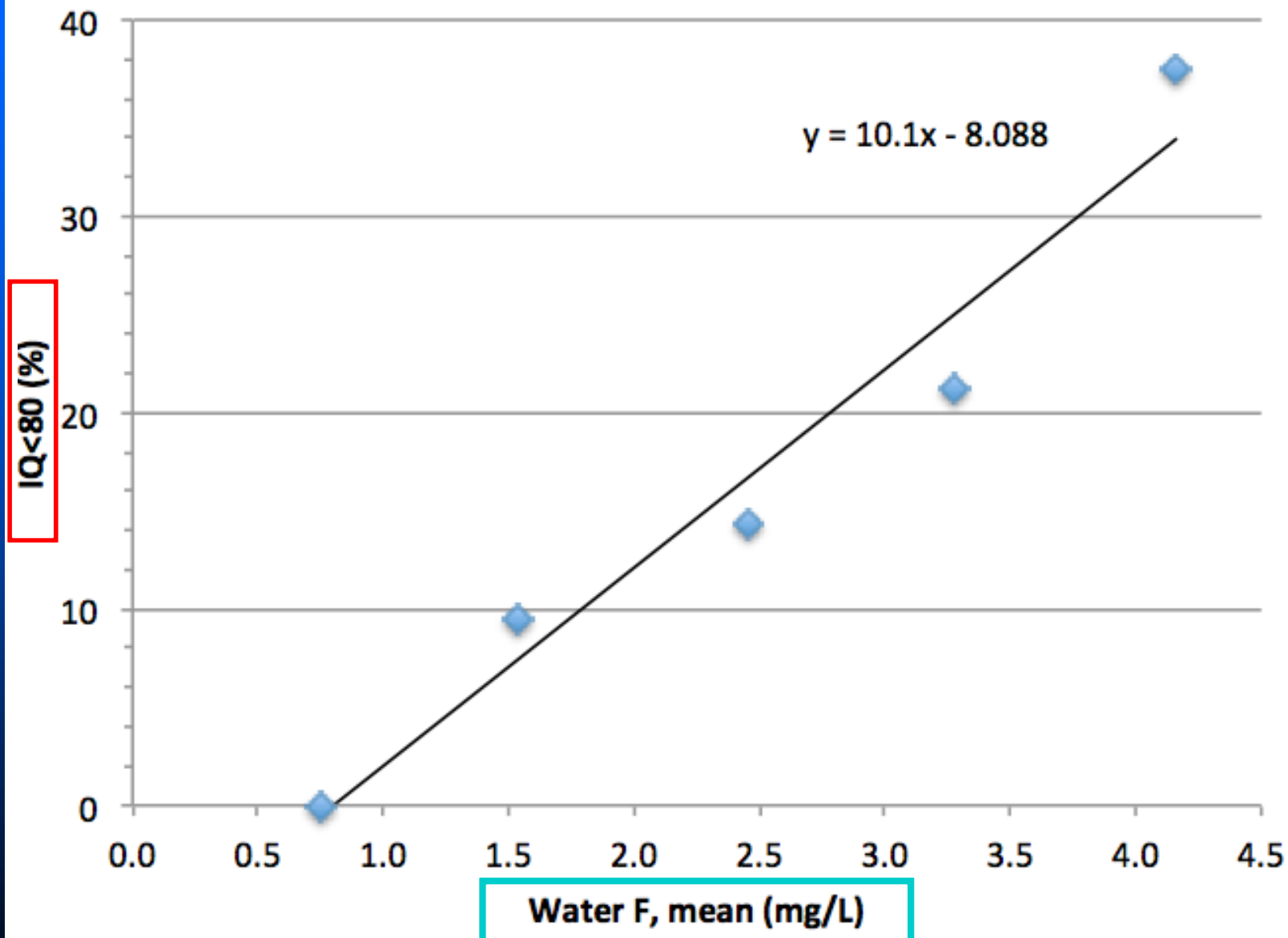
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* $p < 0.05$. [†] $p < 0.01$ compared with group F.

Percent IQ<80 vs Water F

(for "high F" village Waimao, grouped by water F category)



Dr. Philippe Grandjean

“Fluoride seems to fit in with lead, mercury, and other poisons that cause chemical brain drain.”

(Harvard Press Release)

Grandjean is the author of a book published this year entitled *Only One Chance*

An incredible double standard

For many years US regulatory bodies have been aggressively reducing exposure to **neurotoxic** LEAD and MERCURY, BUT

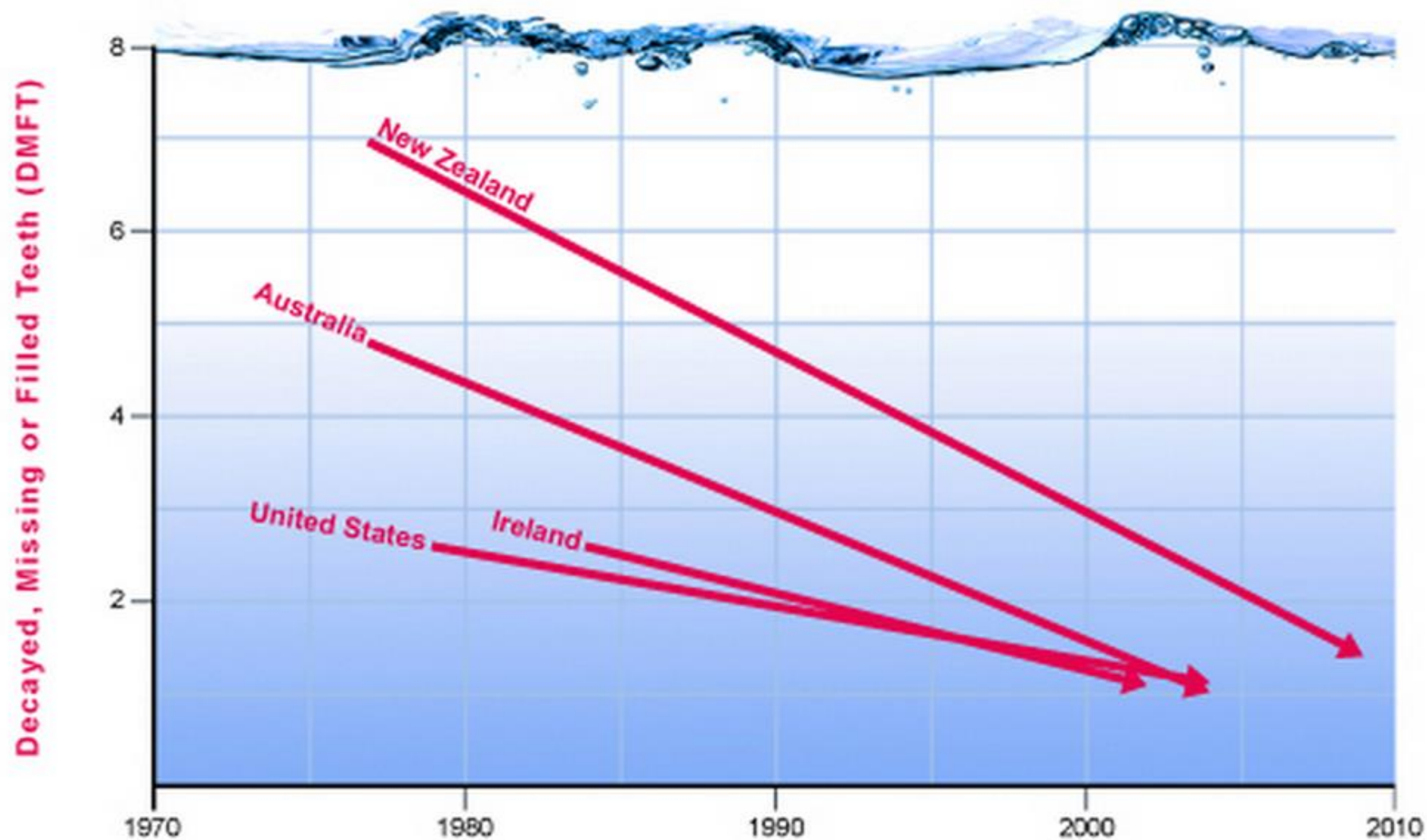
we continue to DELIBERATELY add **neurotoxic** FLUORIDE to our drinking water!

6. The
evidence of
effectiveness
is surprisingly
weak

See
Chapters 6-8 in *The Case
Against Fluoride*

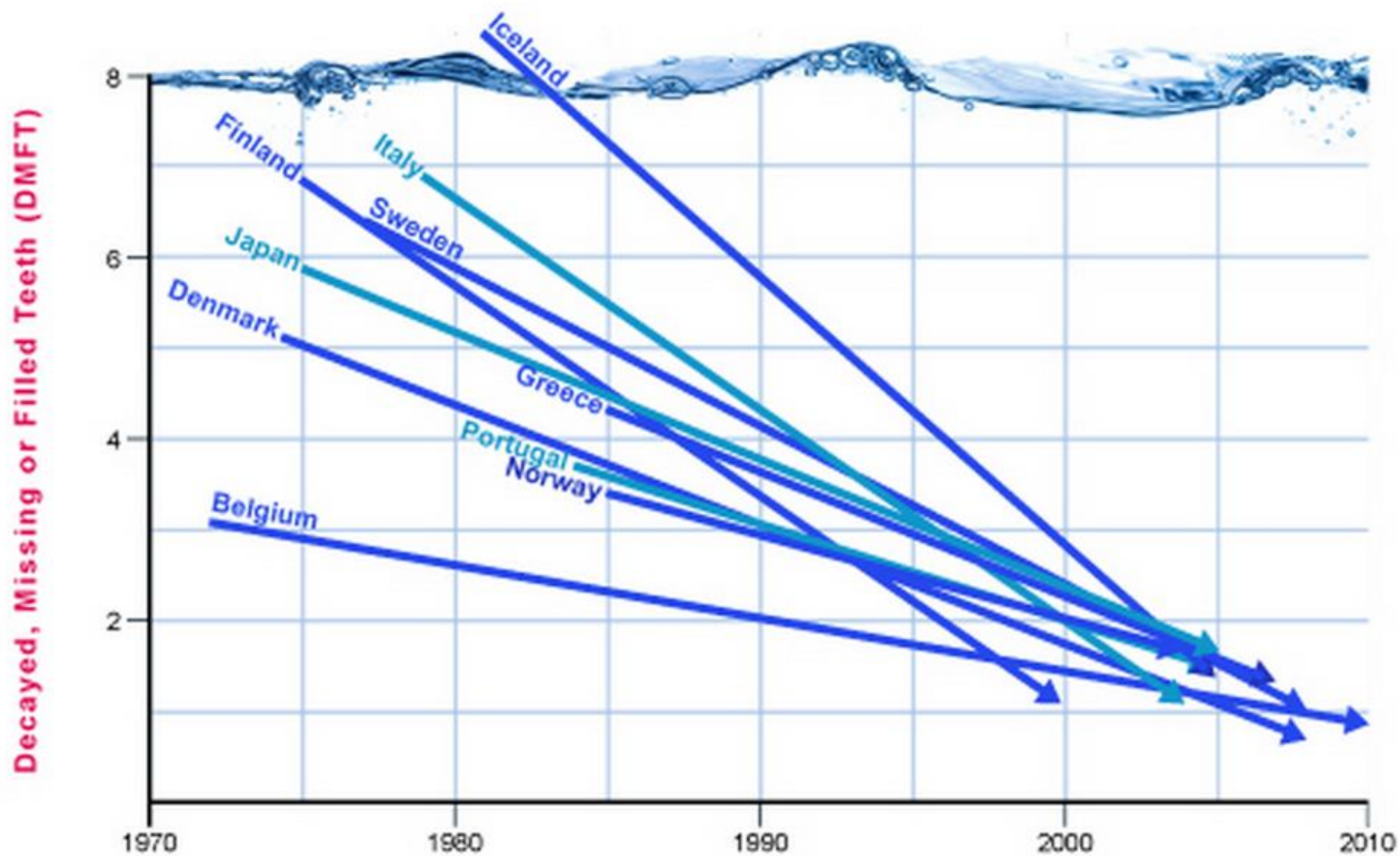
According to WHO data
tooth decay in 12-year-olds
is coming down as fast
in NF as F countries

Tooth decay in countries that fluoridate most of the water



WHO data on DMFT in 12 year olds*

Tooth decay in countries with NO water or salt fluoridation



In Ontario



Ministry of
Health and Long-Term Care

“The magnitude of [fluoridation’ s] effect is not large in absolute terms, **is often not statistically significant, and may not be of clinical significance.**”

SOURCE: **David Locker** for the Ontario
Ministry of Health & Long Term Care, 1999

The Cochrane Review (June, 2015)

- *Could find no good scientific evidence that water fluoridation*
- is of any benefit to adults,
- reduces social inequalities,
- provides additional benefits over and above topically applied fluoride (such as in toothpaste), nor that
- tooth decay increases in communities when fluoridation is stopped.

The most likely explanation for
this poor evidence of benefit
comes from the CDC itself

7. Fluoride's
benefit (if any)
comes from
TOPICAL
action

CDC, MMWR, 48(41); 933-940,
Oct 22, 1999

- “...laboratory and epidemiologic research suggest that fluoride prevents dental caries **predominantly** after eruption of the tooth into the mouth, and its actions primarily are topical...”

This admission by the CDC
should have ended fluoridation in
the US and around the world

If fluoride works primarily on the outside of the tooth why swallow it?

Why expose every tissue of the body to a toxic substance, when you can brush it on your teeth and spit it out?

And why put it in the drinking water and force it on people who don't want it?

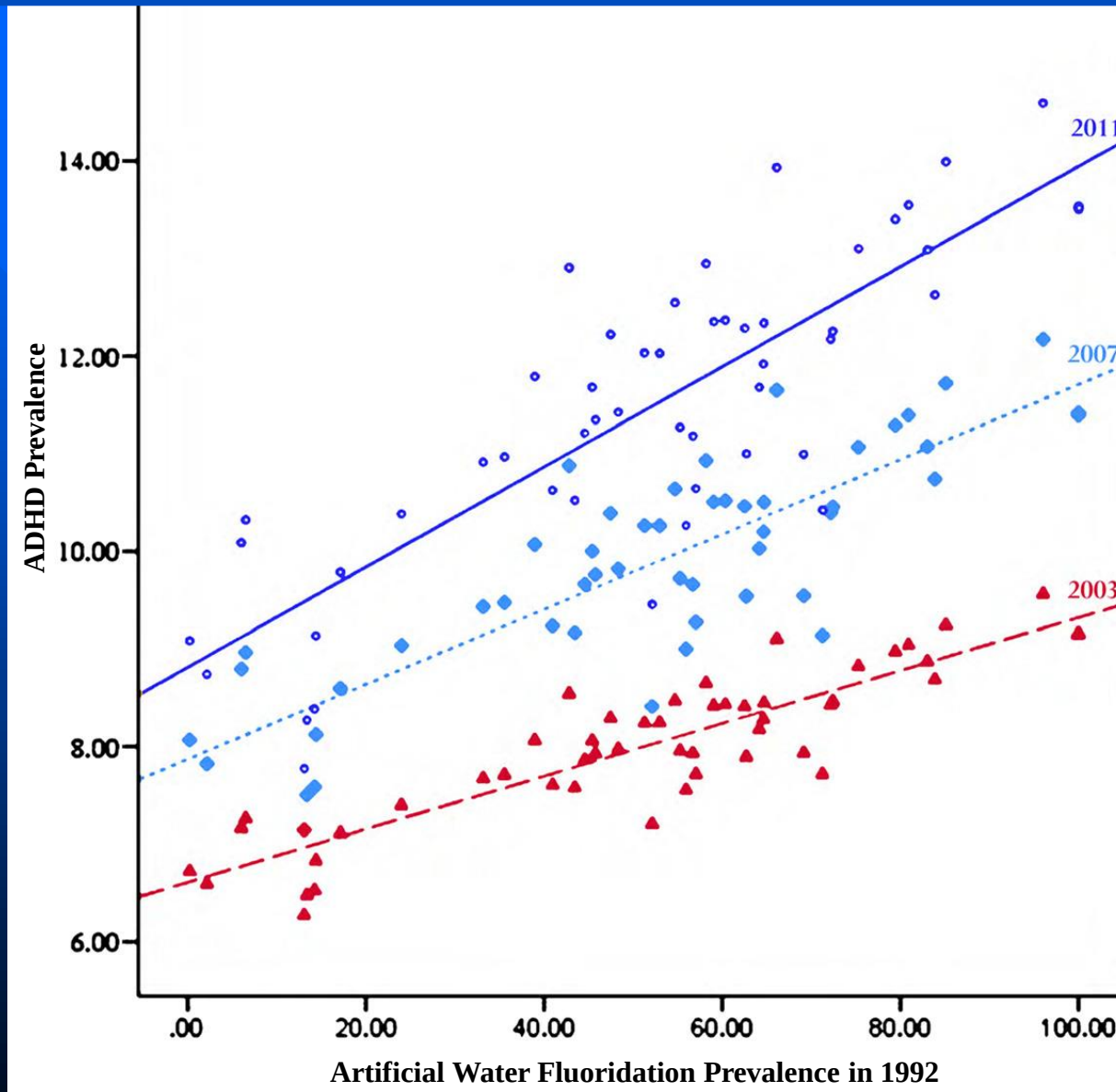
The background of the slide features a blue gradient that transitions from a lighter blue at the top to a darker blue at the bottom. Overlaid on this gradient are several parallel diagonal stripes in a slightly darker shade of blue, running from the top-left towards the bottom-right.

More evidence of harm

USA ADHD study

A J Malin and C Till, *Environmental Health* (2015) 14:17

Percent of children with ADHD (by state) for 2003, 2007 and 2011 plotted against the % of population in each state fluoridated in 1992



UK Hypothyroidism study

UK Hypothyroidism study

Are fluoride levels in drinking water associated with hypothyroidism prevalence in England? A large observational study of GP practice data and fluoride levels in drinking water

S Peckham, D Lowery, S Spencer

Centre for Health Services
Studies, University of Kent,
Canterbury, Kent, UK

Correspondence to
Professor Stephen Peckham,
Centre for Health Services
Studies, University of Kent,
Canterbury, Kent CT2 7NF, UK;
S.Peckham@kent.ac.uk

Received 18 September 2014
Revised 16 January 2015
Accepted 18 January 2015

ABSTRACT

Background While previous research has suggested that there is an association between fluoride ingestion and the incidence of hypothyroidism, few population level studies have been undertaken. In England, approximately 10% of the population live in areas with community fluoridation schemes and hypothyroidism prevalence can be assessed from general practice data. This observational study examines the association between levels of fluoride in water supplies with practice level hypothyroidism prevalence.

Methods We used a cross-sectional study design using secondary data to develop binary logistic regression models of predictive factors for hypothyroidism prevalence at practice level using 2012 data on fluoride levels in drinking water, 2012/2013 Quality and Outcomes Framework (QOF) diagnosed hypothyroidism prevalence data, 2013 General Practitioner registered

disorder, there are few population studies that examine the association of this disease with fluoride intake.³

In the UK, management of hypothyroidism is undertaken by primary care physicians (general practitioners, GPs) and patients' thyroid function (levels of thyroid-stimulating hormone and thyroxine) is tested annually as one element of the GP pay-for-performance system, the Quality and Outcomes Framework (QOF).⁷ These data provide a measure of practice prevalence of hypothyroidism which can be geographically mapped against areas with and without fluoride added to the drinking water. This paper examines whether fluoride levels provide a useful contribution to a predictive model of practice level hypothyroidism, and whether there is any difference in hypothyroidism prevalence between practices serving areas where water is

8. SUMMARY

Fluoridation is:

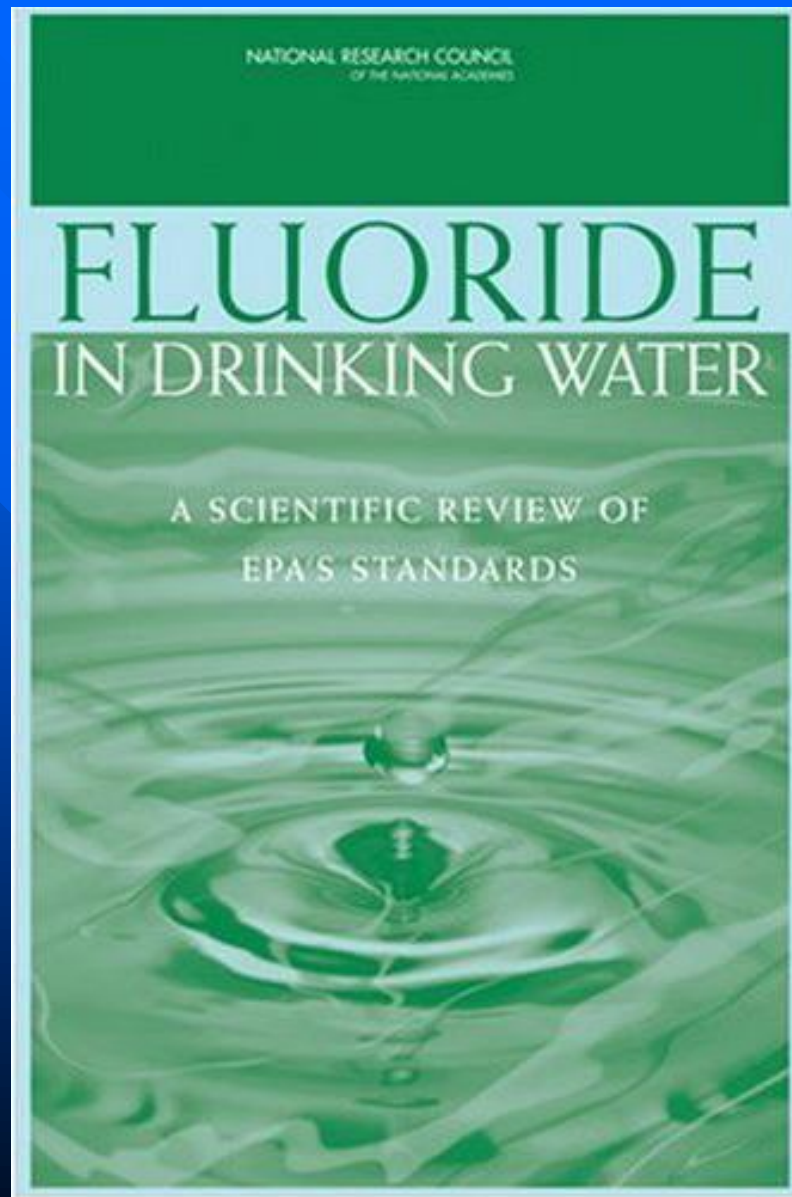
- **Unusual** (most countries don't do it),
- **Unnatural** (the level of fluoride in mothers' milk is extremely low),
- **Unethical** (the government is violating the individual's right to informed consent to human treatment)
- **Unsafe** (dental fluorosis, lowered IQ, accumulation in the bones...) and
- **Unnecessary** (if it works at all it works topically)

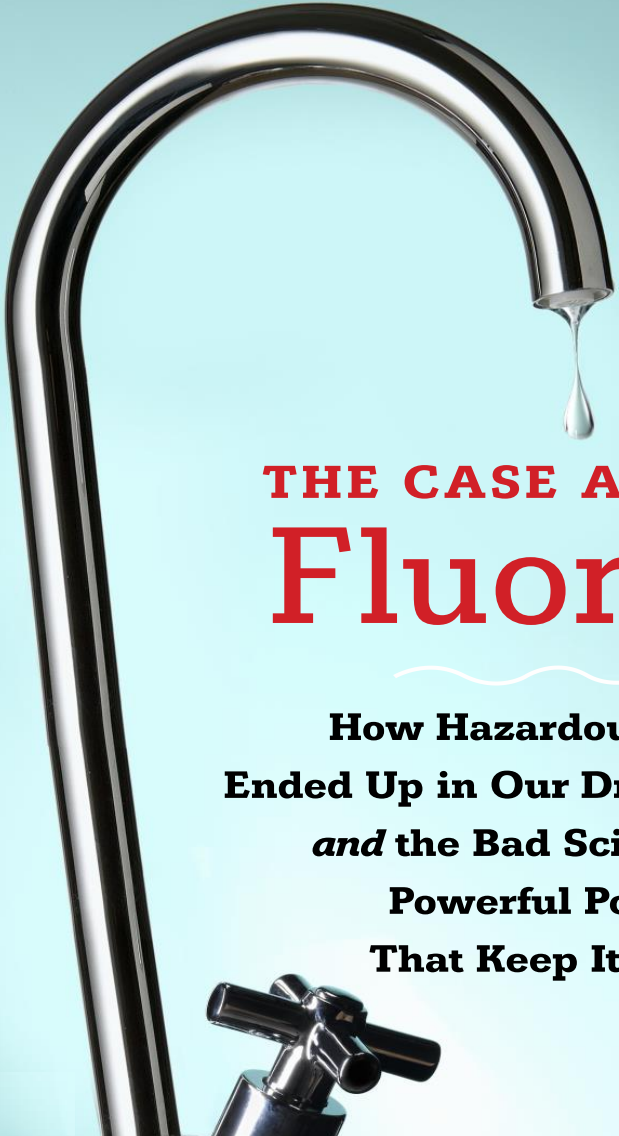
Other countries have demonstrated that there are other – and better - ways of fighting tooth decay without forcing water fluoridation on the whole population. These other ways are not only better for teeth but also for health (fighting obesity)

Fluoridation is an obsolete practice and it is time to end it.

RESOURCES

NRC (2006)





.....
**A New Look
at the Scientific
Evidence**
.....

THE CASE AGAINST Fluoride

**How Hazardous Waste
Ended Up in Our Drinking Water
and the Bad Science and
Powerful Politics
That Keep It There**

PAUL CONNETT, PhD

James Beck, MD, PhD | H. Spedding Micklem, DPhil

Book published
by Chelsea Green

October, 2010

Can be ordered
on Amazon.com

Contains
80 pages
of references
to the
Scientific
literature

See Also

“50 Reasons to Oppose Water
Fluoridation”

at

www.FluorideACTION.net

Please watch the
28 minute DVD

“Professional Perspectives on
Water Fluoridation”

www.FluorideACTION.net

Please watch the
20 minute DVD

“TEN FACTS on FLUORIDE”
PLUS BOOKLET (10 sides)

at

www.FluorideACTION.net

Please watch the
20 minute DVD

“OUR DAILY DOSE”
produced by Jeremy Seifert
(GMO OMG)

at

www.FluorideACTION.net

See the 46 minute TV debate
between Professor Paul Connett
and Dr. Richard Kahn on
New Brunswick (NJ)
Educational TV (May, 2015)
at
www.FluorideACTION.net

The background of the slide features a blue gradient that transitions from a lighter blue at the top to a darker blue at the bottom. Overlaid on this gradient are several parallel diagonal stripes in a slightly darker shade of blue, running from the top-left towards the bottom-right.

EXTRA SLIDES

A note on endorsements

1. Proponents use a long list of endorsements from government agencies and professional bodies that claim that fluoridation is “safe and effective”
2. But these endorsements date back to the 1950s and were made when there was virtually no science on the table
3. All they represent today is how difficult it is for bureaucracies to change their minds once they have adopted something as a “policy.”

A note on endorsements

When 'Policy' is king,
science becomes a slave!

Endorsements

These endorsements have not impressed most of the world. The vast majority of countries do not fluoridate their water – including 97% of Europe

97% of Western European population now drinks Non-Fluoridated Water

Austria
Belgium
Denmark
Finland
France
Germany
Greece
Iceland



Italy
Luxembourg
Netherlands
Northern Ireland
Norway
Scotland
Sweden
Switzerland

97% of Western European population now drinks Non-Fluoridated Water

Austria*
Belgium
Denmark
Finland
France*
Germany*
Greece
Iceland



Italy
Luxembourg
Netherlands
Northern Ireland
Norway
Scotland
Sweden
Switzerland*

*Some fluoridate their salt

Beware of “reviews” conducted by pro-fluoridation governments

These are usually conducted by hand-picked panels with a majority already pro-fluoridation. The results are predictable and self-serving. Examples:

The 2002 Irish Fluoridation Forum

The 2007 Australian NHMRC review

The 2011 Health Canada Review

Health Canada panel

In the case of the 2011 Health Canada Review, they relied on a panel of six experts – 4 of which were dentists and well-known to be pro-fluoridation!

IQ reductions have been significantly associated with fluoride in water at

- **0.7 to 1.2 mg/L** (Sudhir 2009); **0.88 mg/L** among children with iodine deficiency. (Lin 1991) **1.4 ppm** (Zhang 2015); **1.8 ppm** (Xu 1994); **1.9 ppm** (Xiang 2003a,b); **0.3-3.0 ppm** (Ding 2011); **2.0 ppm** (Yao 1996, 1997); **2.1-3.2 ppm** (An 1992); **2.2 ppm** (Choi 2015); **2.3 ppm** (Trivedi 2012); **2.38 ppm** (Poureslami 2011); **2.4-3.5 ppm** (Nagarajappa 2013); **2.45 ppm** (Eswar 2011); **2.5 ppm** (Seraj 2006); **2.5-3.5**

IQ reductions have been significantly associated with fluoride in water at

■ CONTINUED:

- 2.5-3.5 ppm (Shivaprakash 2011); 2.85 ppm (Hong 2001); 2.97 ppm (Wang 2001, Yang 1994); 3.1 ppm (Seraj 2012); 3.15 ppm (Lu 2000); 3.94 ppm (Karimzade 2014); and 4.12 ppm (Zhao 1996).**

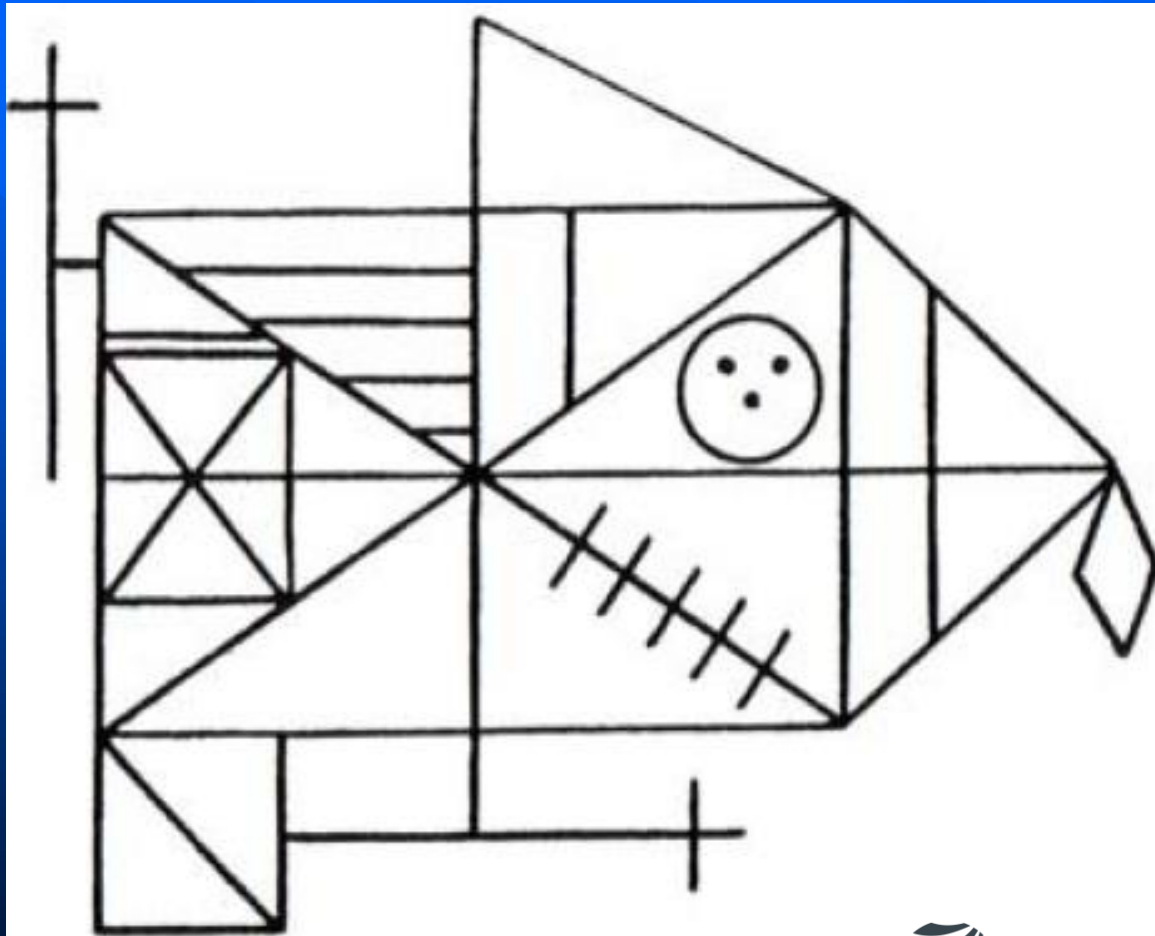
Fluoride's Neurotoxicity

- Of the 314 studies relating to fluoride's effects on the brain, 121 address fluoride's effects on cognitive function, including 76 human studies and 45 animal studies.

Other human studies (in addition to IQ studies)

- 1) Rey-Osterrieth Complex Figure Test (ROCT), Rocha-Amador, 2009
- 2) Neurobehavioral Core Test Battery (NCTB), Yazdi, 2011 and Guo, 2011
- 3) Neonatal Behavioral Neurological Assessment (NBNA), Li, 2004
- 4) Fetal Brain Studies, Yu, 1996; Dong, 1989; Du, 1992 and Hen, 1989

Rey-Osterrieth Complex Figure Test



Rey Osterrieth Complex Figure Test

Rocha Amador (2009)

- High quality study
 - Controlled for key variables (e.g., education, nutritional status, exposure to other contaminants)
 - Individual-based fluoride exposures (urine F levels)
- Findings:
 - “Approximately **9 out of 10 children** were unable to copy the ROCF as expected for their age.”
 - “For Immediate Recall, almost **6 out of 10 children** were unable to draw the figure as expected for their age.”



Dr. William Hirzy, a former risk assessment specialist at US EPA, has used standard risk assessment procedures to calculate a **safe level of fluoride that would protect all children against lowered IQ** *and this is exceeded in the US even before consuming fluoridated water!*

Please Note:

The fluoridating chemicals are not pharmaceutical grade (they come from the wet scrubbing systems of the phosphate fertilizer industry) and **contain both arsenic and lead**, which are also neurotoxic!



CITY COUNCIL AGENDA ITEM

REQUESTED COUNCIL MEETING DATE 11/17/2015

Consent item: No

SUBJECT: Time and Attendance Presentation

DEPARTMENT: Administrative Services

GOAL: 6 - Organizational Excellence

OBJECTIVE: 8 - Enhance management capabilities

RECOMMENDED MOTION:

SUMMARY: There has been some discussion on how the city processes payroll. This presentation is intended to give a high level overview of how time and attendance is approved across the city.

Project	Funding Account
No.:	No.:

ATTACHMENTS:

1.	Time and Attendance Presentation	Time and Attendance Presentation.potx
----	----------------------------------	---------------------------------------

Fenwick, Robin
Rosen, Alan
Carrizales, Heather
Johansson, M. Jake

Created/Initiated - 10/28/2015
Approved - 10/28/2015
Approved - 11/12/2015
Final Approval - 11/12/2015



Time and Attendance

City Manager's Department

Presenter Michael "Jake" Johansson, City Manager

November 17, 2015



Summarize Timekeeping/Payroll Process for:

1. Salaried & Hourly Employees
2. Firefighters/Police





Executime 2009





Executime Process

Current Period Previous Period History

Employee Timesheet Approval

Data displayed for [REDACTED]

Pay Period: 11/09/2015 - 11/15/2015

Regular	Overtime	Comptime	Benefits	Deduction	Rounding	Other	Amount	Total
20.00	0.00	0.00	12.00	(0.00)	0.00	0.00	0.00	32.00

Initials: Approve

Regular Time	Employee	Supervisor	Department Head
20.00			

Approve All ☒	Rules	Day	Date	In	Out	Type	Time Logged	Auto Deduction	Daily Total	Time Total	Amount	Shift	Project	Comment	Employee	Supervisor	Department Head
☒	☒	Mon	11/09/2015			IO (Clock In/Out)	4.00	0.00	4.00	4.00	0.00						
☒	☒	Mon	11/09/2015	08:00	12:00	03 (Sick time)	4.00	0.00	8.00	8.00	0.00			Christian gets his braces on			
☒	☒	Tue	11/10/2015			IO (Clock In/Out)	8.00	0.00	8.00	16.00	0.00						
☒	☒	Wed	11/11/2015	08:00	16:00	04 (Vacation)	8.00	0.00	8.00	24.00	0.00			Veteran's Day - School closed			
☒	☒	Thu	11/12/2015			IO (Clock In/Out)	8.00	0.00	8.00	32.00	0.00						



Executime Process

Current Period Previous Period History

Employee Time Summary

Select Pay Period: WK

Viewing Pay Period: 11/09/2015 - 11/15/2015

	Rules	Employee	Supervisor	Department Head	Name	Employee ID	Type	Regular	Overtime	Comptime	Benefits	Deduction	Other	Amount	Total	
Details	☐	⚠	⚠	⚠	██████████	13989	H	23.50	0.00	0.00	3.50	(3.00)	0.00	0.00	27.00	
Details	☐	⚠	⚠	⚠	██████████	14279	H	24.00	0.00	0.00	0.00	(3.00)	0.00	0.00	24.00	
Details	☐	✓	⚠	⚠	██████████	13809	S	20.00	0.00	0.00	12.00	(0.00)	0.00	0.00	32.00	
Details	☐	✓	⚠	⚠	██████████	14161	S	31.50	0.00	0.00	0.50	(0.00)	0.00	0.00	32.00	
Details	☐	✓	⚠	⚠	██████████	13564	S	32.00	0.00	0.00	0.00	(0.00)	0.00	0.00	32.00	

Approval Type: Supervisor

Initials: Approve Selection

“Time Balancer” is usually an administrative assistant or department head



Executime Process

EXAMPLE OF WEEKLY PAYROLL APPROVAL SCREEN

Employee ID	Type	Regular	Overtime	Comptime	Benefits	Deduction	Other	Amount	Total	Employee	Supervisor	Department Head
14123	H	40.00	0.00	0.00	0.00	(5.00)	0.00	0.00	40.00	BA	rif	mhj
14235	S	40.00	0.00	0.00	0.00	(0.00)	0.00	0.00	40.00	bna	AR	AR
14052	H	40.00	0.00	0.00	0.00	(5.00)	0.00	0.00	40.00	AA	JCH	AR
14025	H	38.50	0.00	0.00	1.50	(5.00)	0.00	0.00	40.00	blc blc	JCH	AR
13809	S	40.00	0.00	0.00	0.00	(0.00)	0.00	0.00	40.00	hmc	AR	AR
13753	S	40.00	0.00	0.00	0.00	(0.00)	0.00	0.00	40.00	WC	WC	mhj
13001	S	32.00	0.00	0.00	8.00	(0.00)	0.00	0.00	40.00	CC	JCH	AR
14161	S	38.70	0.00	0.00	1.30	(0.00)	0.00	0.00	40.00	pd	hmc	AR
12823	S	40.00	0.00	0.00	0.00	(0.00)	0.00	0.00	40.00		ckr	mhj
13950	S	36.00	0.00	0.00	4.00	(0.00)	0.00	0.00	40.00	rif		mhj
14077	S	40.00	0.00	0.00	0.00	(0.00)	0.00	0.00	40.00	raf	JCH	AR
13896	S	40.00	0.00	0.00	0.00	(0.00)	0.00	0.00	40.00	df	JCH	AR
14248	PT	29.00	0.00	0.00	0.00	(4.00)	0.00	0.00	29.00	fdg	rif	mhj
14095	H	40.00	0.00	0.00	0.00	(5.00)	0.00	0.00	40.00	tg	rif	mhj
13644	S	40.00	0.00	0.00	0.00	(0.00)	0.00	0.00	40.00	JCH	kl	AR

A green, rectangular time recorder with a clock face. The clock face has numbers 1 through 12 and a small seconds sub-dial. The brand name 'Acropoint' is visible on the clock face. Below the clock face, there is a label that reads 'Acropoint Time Recorder Inc.' and a small circular logo.



Police and Fire Process

Police officer and firefighter time card examples

EMP # 014072 DEPT # 032
WEEK ENDING 5/03/15
SIGNATURE *[Signature]*

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
A.M.	IN	IN	IN	IN	IN	IN	IN
NOON	OUT	OUT	OUT	OUT	OUT	OUT	OUT
P.M.	IN	IN	IN	IN	IN	IN	IN
A.M.	OUT	OUT	OUT	OUT	OUT	OUT	OUT
REG HRS	8.0	8.0	8.0	8.0	8.0	8.0	8.0
OT HRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SICK HRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VAC HRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COURT HRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOLIDAY HRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W/C HRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OTHER HRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOT HRS	8.0	8.0	8.0	8.0	8.0	8.0	8.0

OVERTIME JUSTIFICATION

DAY 6 5.2.15 SHIFT COVERAGE 12.0 HRS OT
DAY 7 5.3.15 SHIFT COVERAGE 12.0 HRS OT + 2.0 HRS OT = 14.0 HRS OT
DELTA
DELTA
DELTA

TOTAL 26.06 HRS OT
TOTAL 42.0 HRS

EMP # 014135 DEPT # 031
WEEK ENDING 9/21/14
SIGNATURE *[Signature]*

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
A.M.	IN	IN	IN	IN	IN	IN	IN
NOON	OUT	OUT	OUT	OUT	OUT	OUT	OUT
P.M.	IN	IN	IN	IN	IN	IN	IN
A.M.	OUT	OUT	OUT	OUT	OUT	OUT	OUT
REG HRS	8.0	8.0	8.0	8.0	8.0	8.0	8.0
OT HRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SICK HRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VAC HRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COURT HRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOLIDAY HRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W/C HRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OTHER HRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOT HRS	8.0	8.0	8.0	8.0	8.0	8.0	8.0

OVERTIME JUSTIFICATION

SP#08.00
2P
0800
SP#07.91
24
SP#08.01

TOTAL 48



Police and Fire Process

Spreadsheet Example

CITY OF PORT ORANGE PAYROLL WEEK ENDING 11/8/2015															COMP
EMPLOYEE NAME	ID #	REG	OT	OT @	ST	SICK	SLB	VAC	HOL	W/C	BRV	COMP +	COMP -	TOTAL	
		56.00		4.50										60.50	
		45.00	4.75	4.50						11.00				65.25	
		8.00						48.00						56.00	
		32.00				24.00								56.00	
														0.00	
		0.00												0.00	
		56.00		2.50										58.50	
		56.00	28.50	4.50										89.00	
		51.00						5.00						56.00	
		56.00	29.69	3.25										88.94	
		56.00	9.00	15.00										80.00	
		56.00												56.00	
		56.00	0.21	4.50										60.71	
		56.00		4.50										60.50	
		56.00												56.00	
		32.00						24.00						56.00	
		56.00		4.50										60.50	
														0.00	
		56.00	38.58	4.50										99.08	
		56.00	12.00	4.50										72.50	
		56.00	16.17	4.50										76.67	
		56.00	18.30	4.50										78.80	
		56.00		4.50										60.50	
		56.00		4.50										60.50	
		56.00	15.03	2.00										73.03	
														0.00	
		32.00		1.00				24.00						57.00	
		56.00												56.00	
		56.00		0.62										56.62	
		56.00		0.29										56.29	
		56.00	33.00	15.00										104.00	



CITY COUNCIL AGENDA ITEM

REQUESTED COUNCIL MEETING DATE 11/17/2015

Consent item: No

SUBJECT: Community Development Block Grant (CDBG) Presentation

DEPARTMENT: City Manager

GOAL:

OBJECTIVE:

RECOMMENDED MOTION:

SUMMARY: The presentation will give an overview of the Community Development Block Grant (CDBG) program as well as the program requirements and planned projects.

Project	Funding Account
No.:	No.:

ATTACHMENTS:

1.	CDBG Overview	CDBG PowerPoint 2015.potx
----	---------------	---------------------------

Fenwick, Robin
Donahue, Kent
Johansson, M. Jake

Created/Initiated - 10/23/2015
Approved - 11/12/2015
Final Approval - 11/12/2015



CDBG Community Development Block Grant Program

**City Manager's Office
2015**



Agenda

- **Overview of the CDBG program**
- **Background/History**



CDBG Background

The Community Development Block Grant (CDBG) Program was authorized by Title I of the Housing and Community Development Act of 1974. The funds are a block grant that can be used to address critical and unmet community needs including those for housing rehabilitation, public facilities, infrastructure, economic development, public services, and more.

Since 1974, the CDBG program has invested \$144 Billion in communities nationwide.





CDBG Background

The CDBG program's primary objective is to develop viable urban and rural communities, by expanding economic opportunities and improving the quality of life, principally for persons of low and moderate income.

Port Orange is an Entitlement Community (50,000 population and above)

The CDBG entitlement program allocates annual grants to larger cities and urban counties to develop viable communities by providing decent housing, a suitable living environment, and opportunities to expand economic opportunities, principally for low- and moderate-income persons.



CDBG Background

The CDBG program's primary objective is to develop viable urban and rural communities, by expanding economic opportunities and improving the quality of life, principally for persons of low and moderate income.

- **Entitlement Community**
(works directly with HUD)
- **Sub-recipient Community**
(works indirectly with HUD via another Entitlement (Volusia County))



CDBG Background

Required Planning Elements:

Annual Action Plan

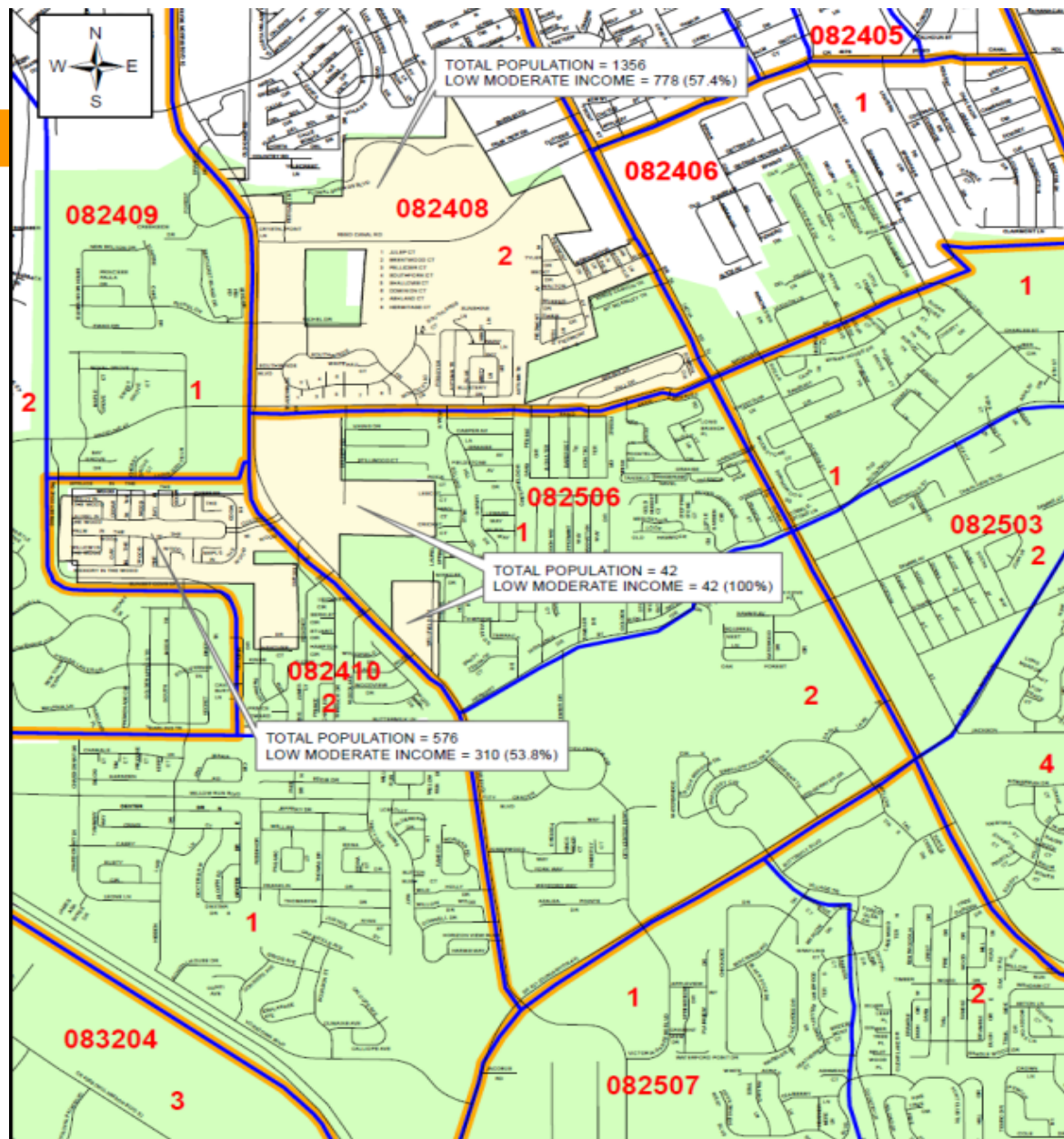
[Plan Development, Advertisement, Public Comment Period, Public Hearing, City Council Approval]

Annual Consolidated Performance and Evaluation Report (CAPER)

[Report Development Advertisement, Public Comment Period, Public Hearing]

Five Year Consolidated Plan

Impediments Analysis to Fair Housing Choice (every Five Years)



City of Port Orange CDBG Low and Moderate Income Demographics

- Census Blockgroup 3
- Census Tract 082507
- 51% or Greater Low-Moderate Income
- Port Orange City Boundary



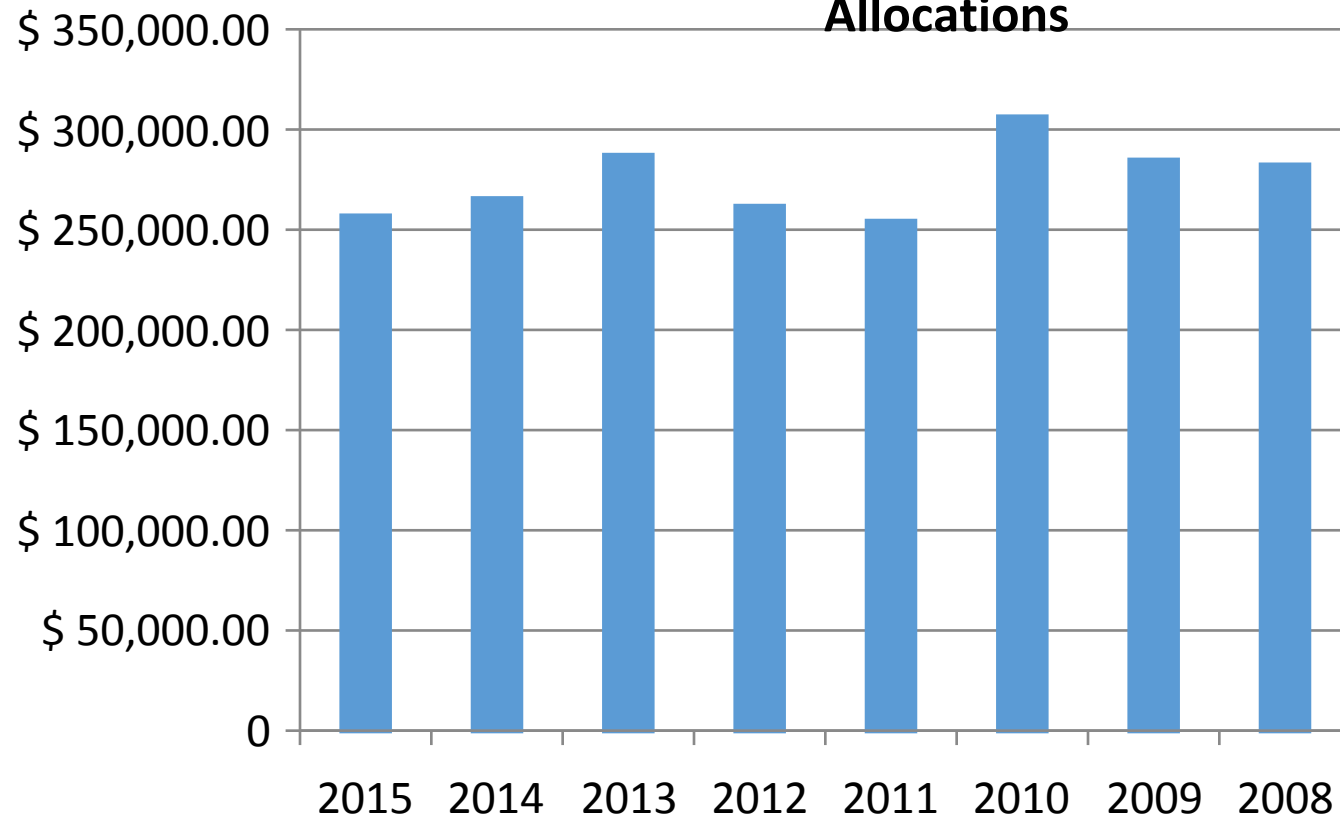
CATEGORIES OF ELIGIBLE ACTIVITIES: (\$570.207)

Acquisition of Real Property
Disposition
Public Facilities and Improvements
Clearance
Public Services
Interim Assistance
Relocation
Loss of Rental Income
Privately-Owned Utilities
Rehabilitation
Construction of Housing
Code Enforcement
Special Economic Development Activities

Microenterprise Assistance
Special Activities by CBDOs
Homeownership Assistance
Planning and Capacity Building
Program Administration Costs
Miscellaneous Other Activities



Port Orange CDBG Funding Allocations





Recent and Future City CDBG projects:

- Safe Routes to School Sidewalk project near Port Orange Elementary (2011-2012)
- Acquisition of the Dusk to Dawn Motel (2013 - Removal of Blight)
- Demolition of the Dusk to Dawn Motel (2014 - Removal of Blight)
- Roadway Improvements (2014 – Halifax Dr. and Oak St.)
- White Acres Sewer Improvements (2016)
- Audible Pedestrian Signal Crossing (2016 – Fulfill ADA requirements)



Project Year

Oct. 1, 2015 – Sept. 30, 2016

Timeliness of CDBG Entitlement Spending

HUD Staff conducts a review of expenditures beginning in February.

Final Review – May 31

Example (Feb.):

60 Day Ratio = 1.82

Current drawdown ratio (as of 12/31/2014) = 2.04

Minimum amount required to meet timeliness = \$144,465 (unadj/adj for program income)



Project Selection:

Based on past experience, project selection is focused on eligible activities that can be completed within time constraints.

Examples of past City CDBG projects removed from programming and then reprogrammed:

White Acres Sewer Project

(design engineering not complete and income survey not conducted.)

Safe Routes to Schools

(right-of-way not acquired)



Thank you.



CITY COUNCIL AGENDA ITEM

REQUESTED COUNCIL MEETING DATE 11/17/2015

Consent item: No

SUBJECT: Inflow & Infiltration(I&I) Study Results

DEPARTMENT: Public Utilities

GOAL: 1 - Infrastructure Preservation

OBJECTIVE: 1 - Develop shovel ready projects in preparation for funding opportunities and,
4 - Enhance the infrastructure maintenance programs in order to extend the full life of capital investments

RECOMMENDED MOTION:

SUMMARY: City Council authorized a study to be completed by Wade-Trim, Inc. concerning Inflow and Infiltration (I&I) in the wastewater collection system on March 17th, 2015. The study is now complete and has resulted in a prioritization of areas within the City that require attention. The CIP budget includes \$2 million annually starting in FY17 to address I&I issues over time with more cost effective areas of concern being addressed on a priority basis over time.

Project	Funding Account
No.:	No.:

ATTACHMENTS:

1.	Inflow and Infiltration Study Report	Port Orange I&I - Final 11.02.2015.pdf
2.	I&I Presentation	II Study Presentation 11.02.2015.pptx

Fenwick, Robin
Wilson, Rick
Neff, Andrew
Johansson, M. Jake

Created/Initiated - 10/21/2015
Approved - 10/21/2015
Approved - 11/06/2015
Final Approval - 11/11/2015

INFLOW & INFILTRATION STUDY

CITY OF PORT ORANGE

PREPARED FOR:



**CITY OF PORT ORANGE
UTILITIES DEPARTMENT
1000 CITY CENTER CIRCLE
PORT ORANGE, FL 32129**

PREPARED BY:



**WADE TRIM, INC
3790 DIXIE HIGHWAY N.E., SUITE D
PALM BAY, FL 32905**

OCTOBER 2015

POU2000.01L

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LIST OF ABBREVIATIONS & ACRONYMS

AADF	Annual Average Daily Flow
ADF	Average Daily Flow
CIP	Capital Improvement Project
DMR	Discharge Monitoring Report
GIS	Geographical Information System
gpd	Gallons per Day
gpm	Gallons per Minute
gpy	Gallons per Year
HP	Horsepower
I&I	Inflow & Infiltration
LS	Lift Station
MADF	Monthly Average Daily Flow
MGD	Million Gallons per Day
MOR	Monthly Operating Report
PLS	Private Lift Station
PSI	Pounds per Square Inch
R&R	Rehabilitation & Replacement
RWP	Reclaimed Water Plant (i.e. Wastewater Plant)
TDH	Total Dynamic Head
Tgal	Thousand Gallons
WTP	Water Treatment Plant
WW	Wastewater

1.0 INTRODUCTION

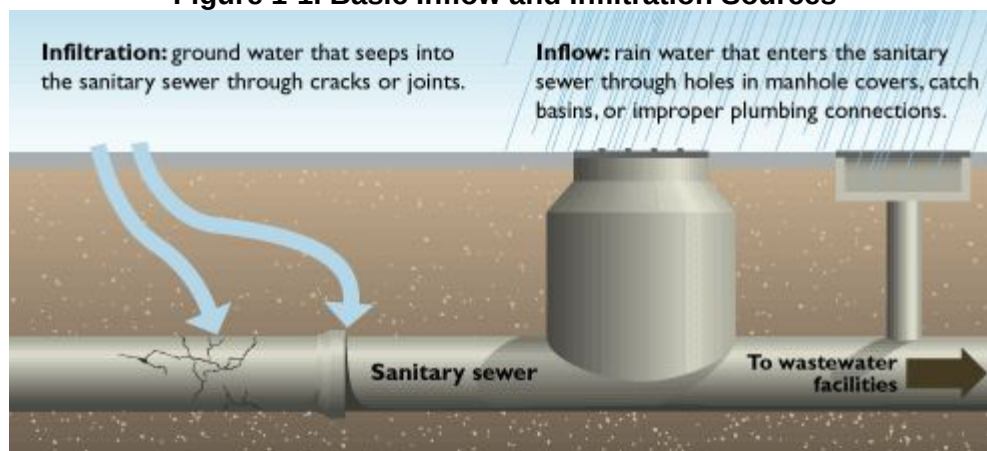
1.1 Background

The City of Port Orange Utilities Department, hereafter referred to as the “City,” has recognized that there has been an increase in the amount of non-sewage flow entering the R. Dwayne Huffman Reclaimed Water Plant (RWP) in relation to the amount of existing and new customers connected to the wastewater collection system. In an effort to identify and reduce the amount non-sewage entering the RWP, the City has taken an active approach in performing physical inspections of the collection system via smoke testing and closed-circuit television (CCTV) surveys. Additionally, the City staff have prepared a memorandum (dated June 5, 2014) that analyzes historical data (May 2013 to April 2014) to identify locations within the City that appear to be major contributors of non-sewage flow into the system. The Staff Memorandum has been provided in **Appendix A**.

1.2 Inflow & Infiltration

The non-sewage flows entering the reclaimed water plant are known more commonly as Inflow & Infiltration (I&I). Inflow & Infiltration are terms used to describe ways that stormwater and groundwater enter into the sanitary sewer systems. Infiltration and inflow may be considered excessive when it is the cause of overflows or bypasses, or the cost to transport and treat exceeds the cost to eliminate it. In cases where the I&I may not be considered “excessive” from a cost-to-eliminate perspective but causes health or environmental risks, corrective actions[†] are required.

Figure 1-1. Basic Inflow and Infiltration Sources



Inflow is stormwater that enters into sanitary sewer systems at points of direct connection. Various sources can contribute to inflow. The most common sources of inflow occur from sewer lateral cleanouts for properties and manhole covers that are damaged, missing, or intentionally opened during rain events to allow stormwater drainage into the sanitary sewer system. Inflow can also include improper/illegal connections of stormwater drainage systems such as connecting downspouts and drains directly to the sewer laterals.

[†] <http://www.epa.gov/region1/sso/pdfs/Guide4EstimatingInfiltrationInflow.pdf>

Infiltration is groundwater that enters sanitary sewer systems through cracks and/or leaks in the sanitary sewer pipes, laterals, manholes and lift station wet well structures. This infiltration can be caused by age related deterioration, loose joints, installation or maintenance errors, physical damage or tree roots. Groundwater can enter these areas wherever sanitary sewer systems lie beneath water tables or the soil above the sewer systems becomes saturated.

1.3 Purpose and Objectives

To further substantiate that there is extensive Inflow & Infiltration of the collection system, the City has tasked Wade Trim to perform an independent analysis to corroborate the findings of the Staff memorandum. In an effort to determine if there was a basis to the findings of the City, Wade Trim reviewed May 2014 through March 2015 data to determine if there was consistency in the trending data from which the City reviewed.

The objective of this report is to provide the City with a roadmap for the reduction of I&I in the most efficient and cost-effective manner as possible. The report begins with the estimation of I&I at the RWP (**Section 2.0**) and at the individual lift stations (**Section 3.0**). The results of this analysis will be used to prioritize the allocation of money and resources to eliminate I&I from the sanitary sewer system (**Section 4.0**). Finally, the benefits of correcting I&I throughout the City will be discussed (**section 5.0**).

2.0 TREATMENT PLANT DATA ANALYSIS

2.1 Introduction

The water and wastewater treatment plant flow data is good source of information for establishing if and/or how much Inflow & Infiltration may be impacting the collection system. Ideally on the principal of “what comes in must come out,” one would expect the amount of wastewater generated per customer to be equal to or slightly less than the amount of potable water used per customer. However, this is usually not the situation due to potable water being used in applications that do not return water to the sanitary collection system (i.e. lawn irrigation, filling of swimming pools, car washing, and cooking).

This section of the report will compare the amount of potable water leaving the water treatment plant and the amount of sewage entering the reclaimed water plant. This will give an indication of the general magnitude of Inflow & Infiltration that impacts the RWP each month.

2.2 Water & Wastewater Plant Flow Data Analysis

The daily flow data from WTP Monthly Operating Reports (MORs) and the RWP Discharge Monitoring Reports (DMRs) was compiled and the monthly average daily flow (MADF) was calculated for each plant. Additionally, the rainfall data was compiled from the WTP MORs and summarized for each month. **Table 2-1** provides a summary of the monthly plant flows and rainfall.

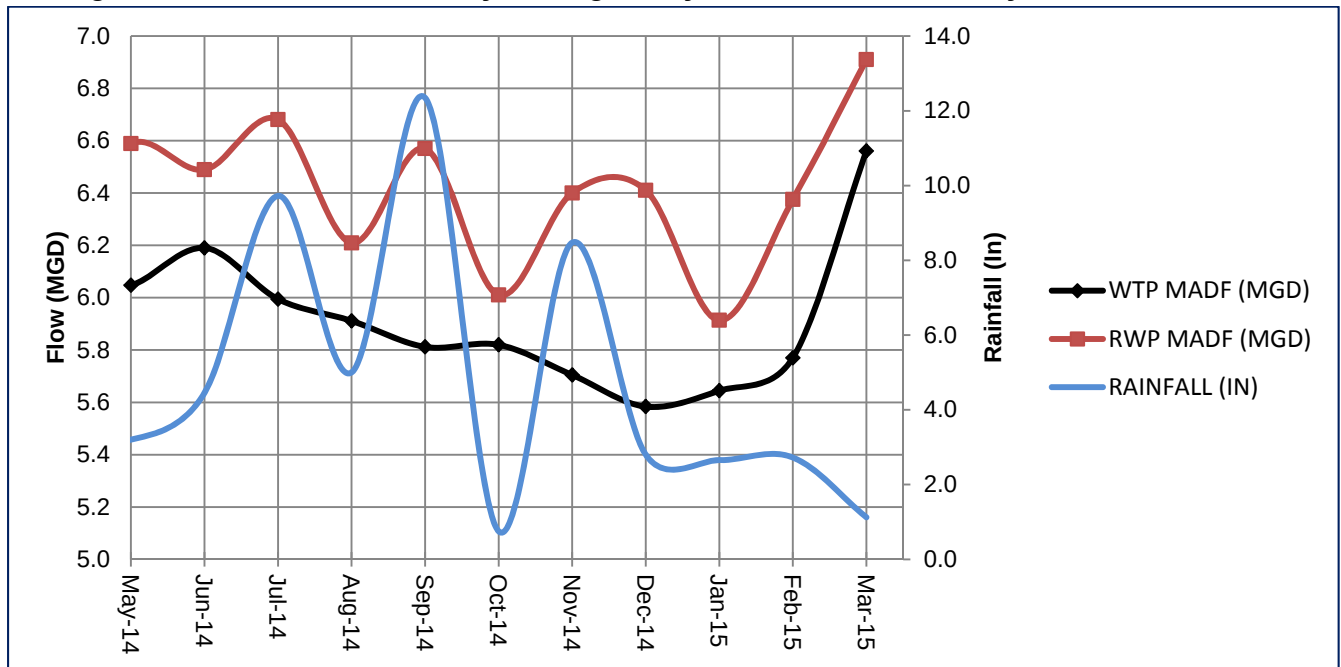
Table 2-1. Monthly WTP / RWP Flow and Rainfall, May 2014 – Mar 2015

Month	POTABLE WATER WTP MADF (MGD)	WASTWATER RWP MADF (MGD)	AVERAGE RAINFALL (inches) ⁽¹⁾
May 2014	6.047	6.589	3.2
June 2014	6.190	6.489	4.5
July 2014	5.995	6.681	9.7
August 2014	5.911	6.209	5.0
September 2014	5.812	6.570	12.4
October 2014	5.820	6.010	0.8
November 2014	5.705	6.400	8.5
December 2014	5.584	6.411	2.8
January 2015	5.645	5.913	2.7
February 2015	5.770	6.376	2.7
March 2015	6.561	6.910	1.1
Average (ADF)	5.913	6.414	4.8

(1) Average of Rainfall recorded at the WTP and the Reclaimed Water Reservoir

The data summarized in **Table 2-1** has been plotted and presented in **Figure 2-1** for further analysis. An expanded look at the total monthly, minimum, maximum plant flows has been provided in **Appendix B**.

Figure 2-1. WTP / RWP Monthly Average Daily Flow and Rainfall, May 2014 – March 2015



When comparing the WTP and RWP flows as shown in **Table 2-1** and **Figure 2-1**, several important observations can be made:

1. The monthly data shows that, on average, there is approximately 0.5 MGD more wastewater generated than potable water produced. This immediately indicates there is I&I in the system.
2. There appears to be a correlation between the potable water usage and wastewater generated (i.e. the more water used, the more wastewater generated).
3. Significant amounts of rain (July 2014, Sept 2014, and Nov 2014) result in an increase in the amount of wastewater entering the RWP.
4. On average, the amount of wastewater entering the RWP is 8.5% (0.50 MGD) higher than the amount of potable water leaving the WTP.

As of the March 2015, there were 33,099 water service accounts and 24,798 wastewater service accounts. For the analysis period, the Average Daily Flow (ADF) at the water and wastewater treatment plant was 5.913 MGD and 6.225 MGD[†], respectively. Dividing the ADF by the number of accounts for each will yield the average gpd per account. Again, based on the principal of “what comes in must come out” the gpd per account for wastewater should be equal or less than the gpd per account for water. In this instance, the wastewater gpd per account is 73 gpd greater than the water. Multiplying the difference by the number of wastewater accounts shows that 1.810 MGD of water from an unknown source is entering the RWP. A summary of this comparison is provided in **Table 2-2**.

[†] The Reclaimed Water Plant ADF as shown in Table 2-1 was 6.414 MGD. This flow includes the PI Fly-In, which is a bulk customer with an average wastewater contribution of 0.189 MGD. The Fly-In contribution was removed for the analysis.

Table 2-2. Water vs Wastewater gpd/Account Comparison

	Water	Wastewater
ADF	5.913 MGD	6.225 MGD ⁽¹⁾
# of Accounts	33,099	24,798
Calculated gpd per Account	179	251
gpd Difference ⁽²⁾	73	
Wastewater in Excess of Water ⁽³⁾	1.810 MGD	

(1) The RWP ADF as shown in Table 2-1 was 6.414 MGD. This flow includes the PI Fly-In, which is a bulk customer with an average wastewater contribution of 0.189 MGD. The Fly-In contribution was removed for the analysis in Table 2-2.

(2) 251 gpd per wastewater account – 179 gpd per water account = 73 gpd difference (excess)

(3) 73 gpd difference (excess) x 24,798 wastewater accounts = 1.810 MGD

Assuming that all water generated by the WTP is returned to the RWP, **Table 2-2** demonstrates that there is potentially 1.810 MGD of excess water being returned to the RWP as I&I.

2.3 Development of Baseline Reclaimed Water Plant Flows

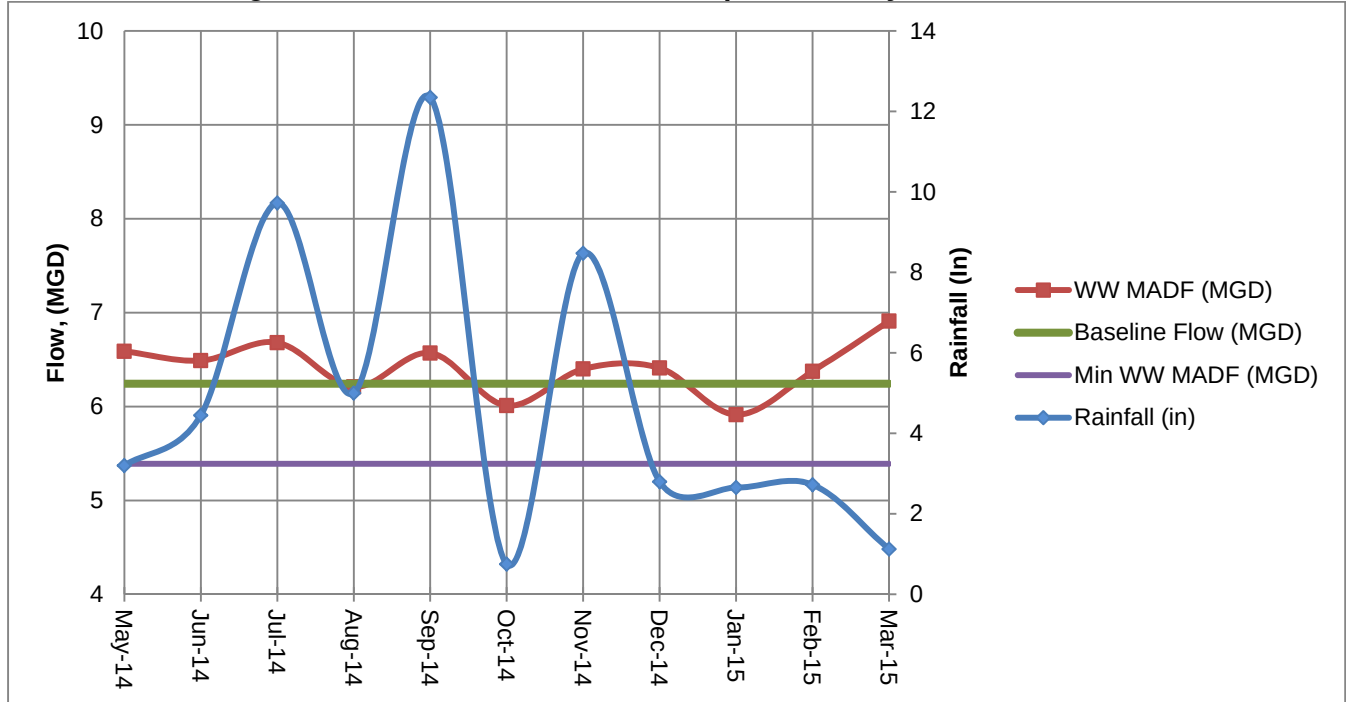
To further understand the magnitude of I&I impacting the RWP, an analysis was performed to determine the baseline flow (or dry weather flow) to the RWP. The goal of this baseline analysis was to determine the average amount of wastewater entering the RWP that is not influenced by rainfall events.

The RWP flow data and rainfall data for the study period were compiled and compared. Days in which there was not a rain event, nor a rain event in the prior 2 days, were included in the results. By only including days without rain for consecutive days removes the impact of inflow from the analysis as well as infiltration directly caused by rain events. The days that were determined not to be influenced by rainfall were averaged and that was calculated to be an average day baseline flow of 6.243 MGD, which became the baseline flow of the analysis. The maximum day flow within the baseline data was found to be 8.164 MGD, which is 1.3 times the average day baseline flow. Therefore, the dry weather peaking factor when comparing the maximum day flow to the average day baseline flow is 1.3.

The baseline flow has been plotted against the actual monthly average daily flow and the rainfall data. For comparison purposes, the actual, average minimum flow was calculated to be 5.389 MGD (bottom 18th percentile of compiled data) for the study period and was plotted in **Figure 2-2** as well. The difference between the ADF and the average minimum flow was 1.025 MGD while the difference between the ADF and the baseline flow was 0.171 MGD. This is most likely due to background infiltration that is occurring regardless of rainfall. The data points used to calculate the average minimum flow primarily occurred during the dry season (November to March).

The results of the analysis are presented in **Figure 2-2**.

Figure 2-2. RWP Baseline Flow Comparison, May 2014 – Mar 2015



- (1) The wastewater (WW) MADF and Rainfall data were previously discussed in Section 2.2.
- (2) The minimum wastewater flow (Min WW) is the average of the minimum flows experienced at the RWP over the study period.

2.4 Rain Event Impact to Reclaimed Water Plant

Rainfall peaking factors were not calculated for the RWP; however, an examination of a small rain event followed by a very large range event occurring in September 2014 highlights the severity of I&I that can be directly attributed to a rain event.

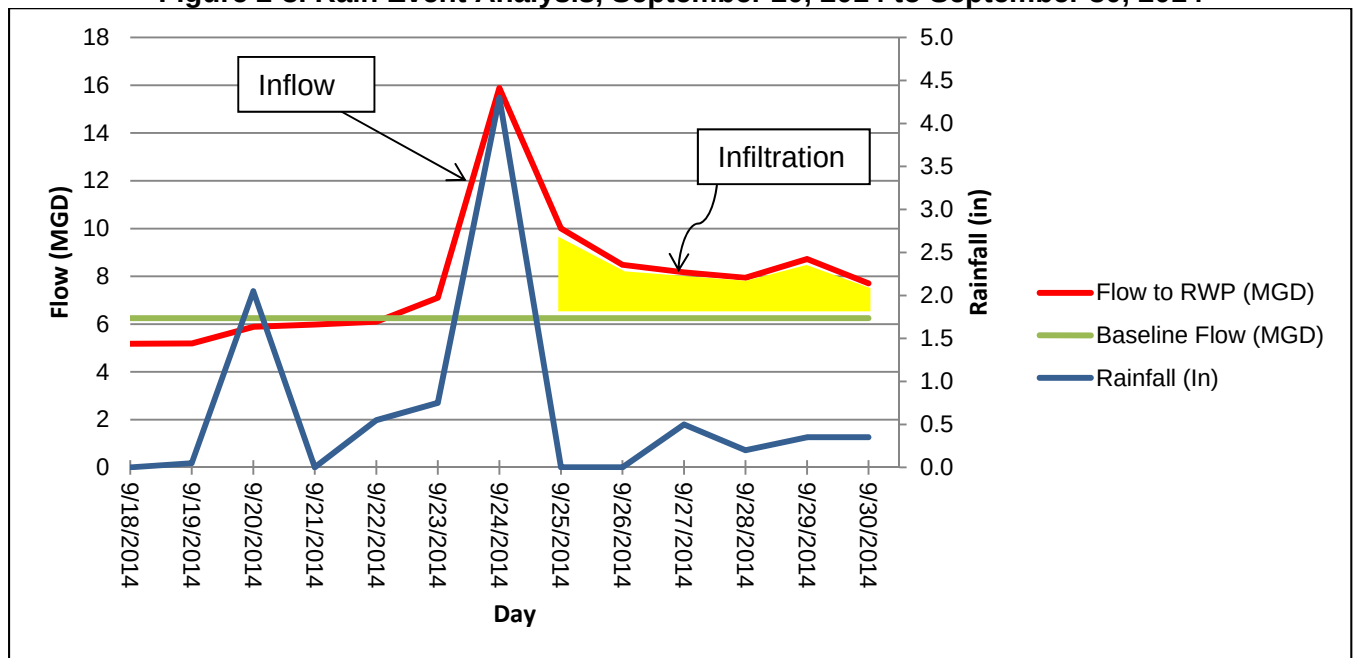
Table 2-3 provides a summary of the daily volume of sewage received by the RWP prior to, during, and immediately after the rain events occurred. The data provided in the table has been plotted in **Figure 2-3**. In addition to the information shown in **Table 2-3**, the baseline flow derived in Section 2.2 has all been provided in the figure. Observations for the RWP flow and the rainfall event are as follows:

1. Prior to the rain event that started on 9/19/2014, the flow to the RWP was below the baseline.
2. As the rainfall event occurred, flow to the RWP slowly increased and exceeded the baseline. Upon inspection of the rainfall data, the rain gauges at the WTP and reclaimed reservoir reported rainfall of 1.3 in and 2.8 inches, respectively. This indicates that the storm was spread out and impacted the City somewhat evenly, thereby slowly impacting the RWP.
3. Before the rainfall-influenced infiltration from the previous rain event stopped, a very large rain event occurred on 9/24/2014. The rain gauge at the RWP recorded 7.8 inches while the rain gauge at the reclaimed reservoir reported only 0.8 inches. As the rainfall intensity was near the RWP, the surrounding lift stations were most like inundated with rainwater, thus causing a large inflow of stormwater into the sanitary sewer system.

4. Wastewater flow to the RWP was over 2.5 times the calculated baseline flow for the plant.
5. After the 9/24/2014 rain event, the flows to RWP began to normalize; however, smaller rain events caused flows to the RWP to remain above the baseline.

Table 2-3. Rain Event Analysis, Sept 20-30, 2014

Date	Flow to RWP (MGD)	Average Rainfall (in)
9/18/2014	5.173	0.00
9/19/2014	5.191	0.05
9/20/2014	5.887	2.05
9/21/2014	5.981	0.00
9/22/2014	6.098	0.55
9/23/2014	7.101	0.75
9/24/2014	15.886	4.30
9/25/2014	10.003	0.00
9/26/2014	8.484	0.00
9/27/2014	8.168	0.50
9/28/2014	7.942	0.20
9/29/2014	8.727	0.35
9/30/2014	7.706	0.35

Figure 2-3. Rain Event Analysis, September 20, 2014 to September 30, 2014


3.0 LIFT STATION ANALYSIS

3.1 Introduction

The City of Port Orange's sanitary collection system is comprised of over 265 miles of gravity sewer, 105 City-owned lift stations, numerous private lift stations, and 70 miles of pressurized force main used to convey sewage to the Reclaimed Water Plant. The oldest components in the collection system date back to the mid-1970s and a majority of the lift stations were constructed prior to 2000. **Figure 3-1** depicts the location of the primary components of the collection system as provided by the City.

The goal of this section of the report is to compile the daily pump runtime data for all lift stations and determine the magnitude of I&I occurring at each lift station and the associated tributary (service) area. This data will be used in combination with other criteria, such as repair/rehabilitation costs and length of unlined sewers, to prioritize (rank) the order in which the lift station tributary areas should be inspected and repaired.

3.2 Lift Station Summary

A listing of the City's lift stations (LS) was provided to Wade Trim for review and use in the analysis. The listing included detailed information for each lift station, such as the number designation, name (typically a subdivision or business), physical address, original construction date, number of pumps, make/model of pumps, and design operating conditions (flow and pressure). The listing also includes basic data for over 50 private lift stations (PLS), though this information was not used in the analysis.

The City's lift stations are numbered LS-1 through LS-117 though there are only 105 lift stations in service. Twelve (12) of the lift station numbers are reserved for future development (LS-91, -94 to -96, -98 to -100 to -103, -109 and -110).

LS-60 only serves as a re-pump station as it does not have a tributary area of its own. LS-53 and LS-54 are master pump stations that convey flows from all other lift stations to the RWP. While LS-54 has a tributary area of its own, LS-53 only serves as a re-pump station.

After reviewing the lift station information file, the City's geographic information system (GIS) shape files and historical plans were reviewed to determine which lift stations serve as re-pump lift stations. Twenty-four (24) re-pump stations were identified as accepting sewage from other lift stations. A summary of the re-pump lift stations and the tributary lift stations can be found in **Table 3-2**. This effort was needed in order to avoid double-counting flows at lift stations during the analysis.

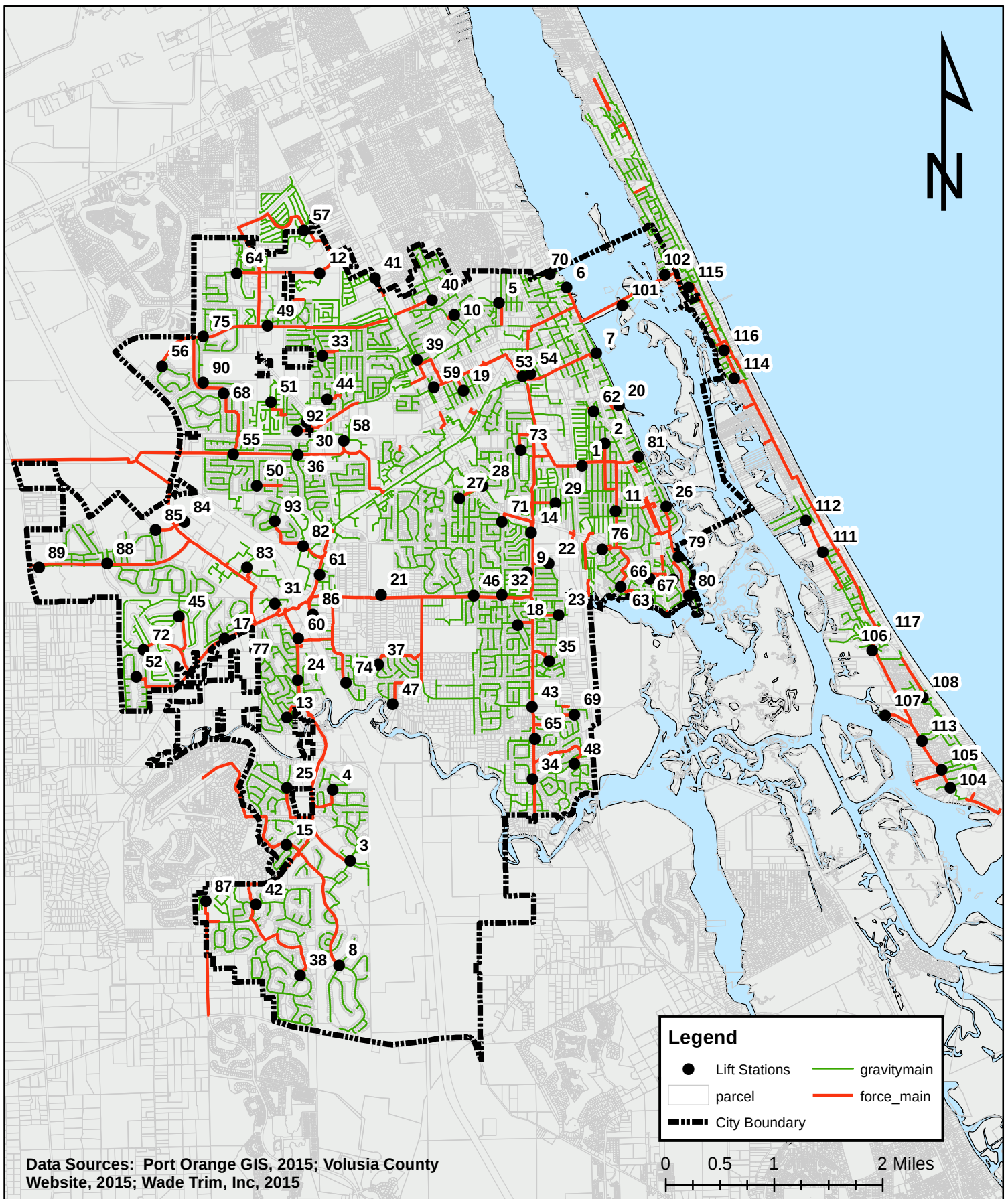


Table 3-1. Re-Pump Lift Stations

Re-Pump LS	LIFT STATION CONNECTIONS
2	62
6	70
7	20
10	5
11	26, 76,79, 80, Multiple Private LS
13	PLS
29	Multiple Private LS
30	51
36	50, Private LS
39	12, 30, 33, 40, 41, 44, 49, 56, 57, 64, 68, 75, 90, 92
40	10
42	87, Multiple Private LS
49	PLS
53	7, 19, 39, 59
54	All Lift Stations except 53
60	Repump Only
63	PLS
67	PLS
69	PLS
81	PLS
102	Multiple Private LS
104	Multiple Private LS
106	108, 111, 112, 117
108	Private LS

3.3 *Compilation of Lift Station Run Times*

The sanitary collection system is controlled and monitored by DataFlow Systems (DFS), which is Supervisory Control and Data Application (SCADA) software. In addition to the monitoring capabilities, DFS also stores on a server daily information for each lift station, including pump status and run times (per pump) and number of starts.

View-only access was granted by the City for Wade Trim to log into the DFS system and extract pump run time data for each lift station. The data for the time period from January 2013 to March 2015 was downloaded. The data was extracted from DFS in CSV (comma separated value) format that had to be converted to XLSX (Excel 2010) format for use in the analysis. Once converted, the contents of each lift station file were sorted and the data was checked for SCADA communication errors and obvious data recording errors.

3.4 Estimation of Lift Station Flows

As previously discussed, the City has 105 lift stations located throughout the City. Each lift station, with few exceptions, has a network of gravity sewers that conveys sewage from customers and to the lift station. As the lift station storage basin (well) fills, the pump(s) activate and discharge the sewage into the force main system. The amount of sewage that enters the force main is dependent on the pressure inside the force main: as the force main pressures increases, the flow entering the force main will decrease. Therefore, pumps are designed to discharge sewage at varying pressure conditions.

When designing a lift station, pumps must be selected that can operate along the range of proposed conditions. Fortunately, each pump operates along a curve that can be plotted and proper pumps can be selected for service. A sample set of pump curves are shown in **Figure 3-2**. In the figure, the curve for a pump with an 8.5-inch impeller (15-20 HP) is highlighted in red. When the pressure condition at the point of connection is 65 feet of head (approx. 28 PSI), the pump will discharge at a rate of 600 gpm. If the pressure increases to 73 feet of head (32 PSI), this pump will only be able to discharge at 400 gpm. This type of variability is common in lift stations as pressures are typically higher in the morning and evening hours when water usage is higher. This results in more lift stations trying to pump into the system, thus increasing the pressures in the force main that the pumps have to overcome.

Figure 3-2. Typical Head (Pressure) vs Flow Pump Curve

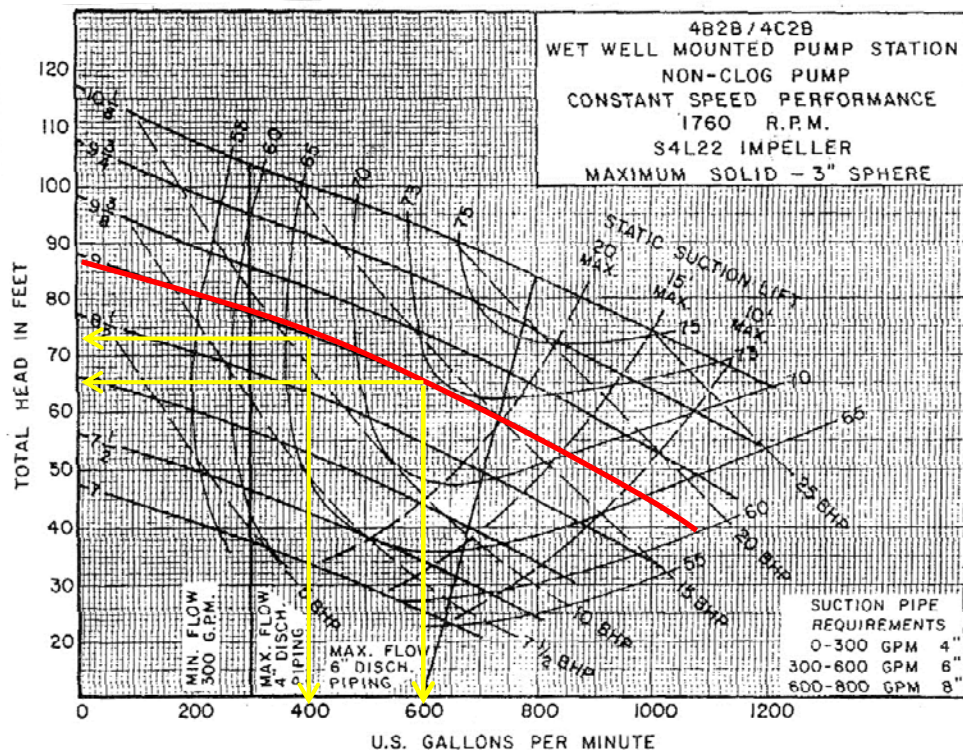


Figure 3-2 is important to the lift station run time analysis as it shows the variability in the rate at which a pump can discharge into the system. Since the sewage flow at a lift station is rarely monitored continuously, actual daily pumping rates are not available. In order to calculate a daily flow from each lift station that can be used in the analysis, the design operating condition (flow in gallons per minute)

was used for each pump. For each lift station, the pump run times were summed and multiplied by the design flow condition. This results in a volume of sewage that was pumped by the lift station each day.

Once the daily flow was determined for each lift station, monthly and average daily flows were tabulated. The calculated average daily flows are provided in **Appendix B**.

3.5 Development of Baseline Flows for Lift Stations

Similar to the methodology employed in **Section 2.3**, the baseline (dry weather day) was established for each lift station. The goal of this baseline analysis was to determine the average amount of wastewater leaving each lift station that was not influenced by rainfall events.

The calculated daily lift station flows and the previously established rainfall data for the study period were compiled and compared. Days in which there was not a rain event, nor a rain event in the prior 2 days, were included in the results. By only including days without rain for consecutive days removes inflow from the analysis as well as infiltration directly caused by rain events. The days in which there were no rain events were averaged and an average daily dry day flow was established for each lift station.

The difference between the calculated lift station flows and the derived baseline flows was calculated for each lift station. The net flow is perceived to be the average daily infiltration due to groundwater sources and not due to rain events. When this net flow is summed for all lift stations in the analysis, the estimated I&I is found to be approximately 282,000 gpd.

The baseline flow and the estimated infiltration are provided for each lift station in **Appendix C**.

3.6 Rainfall Influenced I&I for Lift Stations

Having determined what is believed to be the minimum amount of infiltration occurring throughout the City's lift stations, the next step in the analysis is to determine the amount of I&I that is the direct result of the introduction of stormwater into the sanitary sewer system.

The daily lift station flows that were calculated in **Section 3.4** were processed further so that any flow values that were less than the RWP's baseline dry day peaking factor (1.3) were eliminated. The remaining flow values were compared to the calculated actual daily flow and peaking factors were established for each lift station. All flows that were in excess of the peaking factor were totaled and a daily average was derived. Using this method, the total amount of rainfall-induced I&I from all of the lift stations was calculated to be 567,000 GPD.

The calculated rainfall-influenced I&I seems low when compared to the amount of flow the RWP experienced in September 2014 (per **Section 2.4**). This is primarily due to the rainfall-influenced I&I calculated for the lift stations being an average over the entire analysis period, as opposed to looking at the rapid spike in flow experienced during a single rain event.

The results of this rainfall-influenced I&I analysis are provided for each lift station in **Appendix C**.

3.7 Run Time Analysis - Total Probable I&I

The baseline infiltration was calculated to be 282,000 gpd while the rainfall-influenced I&I was calculated to be 567,000 gpd, resulting in 849,000 gpd of total I&I in the collection system. Though the total I&I calculated in the run time analysis is less than the total I&I calculated in **Section 2.0**, the run time analysis demonstrates that there is a significant issue where non-sewage flows are entering the sanitary collection system.

The twenty (20) lift stations that have been found to experience the most I&I have been ranked and summarized in **Table 3-3**. Twelve (12) of the twenty (20) lift stations have been noted by the City as having issues with excessive run times and/or I&I. The complete listing of lift stations and their total I&I (in gpd) can be found in **Appendix C**.

Table 3-2. Lift Station Listing, Ranked by Total I&I

#	Lift Station Name	Total Calculated I&I (gpd)
LS-39	Nova & Herbert	71,380
LS-11*	Christiancy	56,145
LS-106*	PI Master	56,073
LS-7*	Barnett Bank	54,065
LS-54	Master Pump #2	40,788
LS-41	Lamplighter	35,714
LS-29*	Maplewood	33,261
LS-88	Coraci	30,739
LS-8	Cypress Head #2	25,592
LS-46	Countryside	21,956
LS-2*	Isabelle	20,289
LS-14*	Parkwood	19,644
LS-55	Glenwood Village	18,725
LS-5*	Charles St	18,549
LS-102*	Coral Way	18,421
LS-18*	Cambridge Estates	17,452
LS-101*	Seabird Island	17,012
LS-38	Water's Edge #2	15,311
LS-10*	Nixon/Biro	13,406
LS-40*	Sugar Forest	11,751

* Identified by City Staff as experiencing excessive I&I

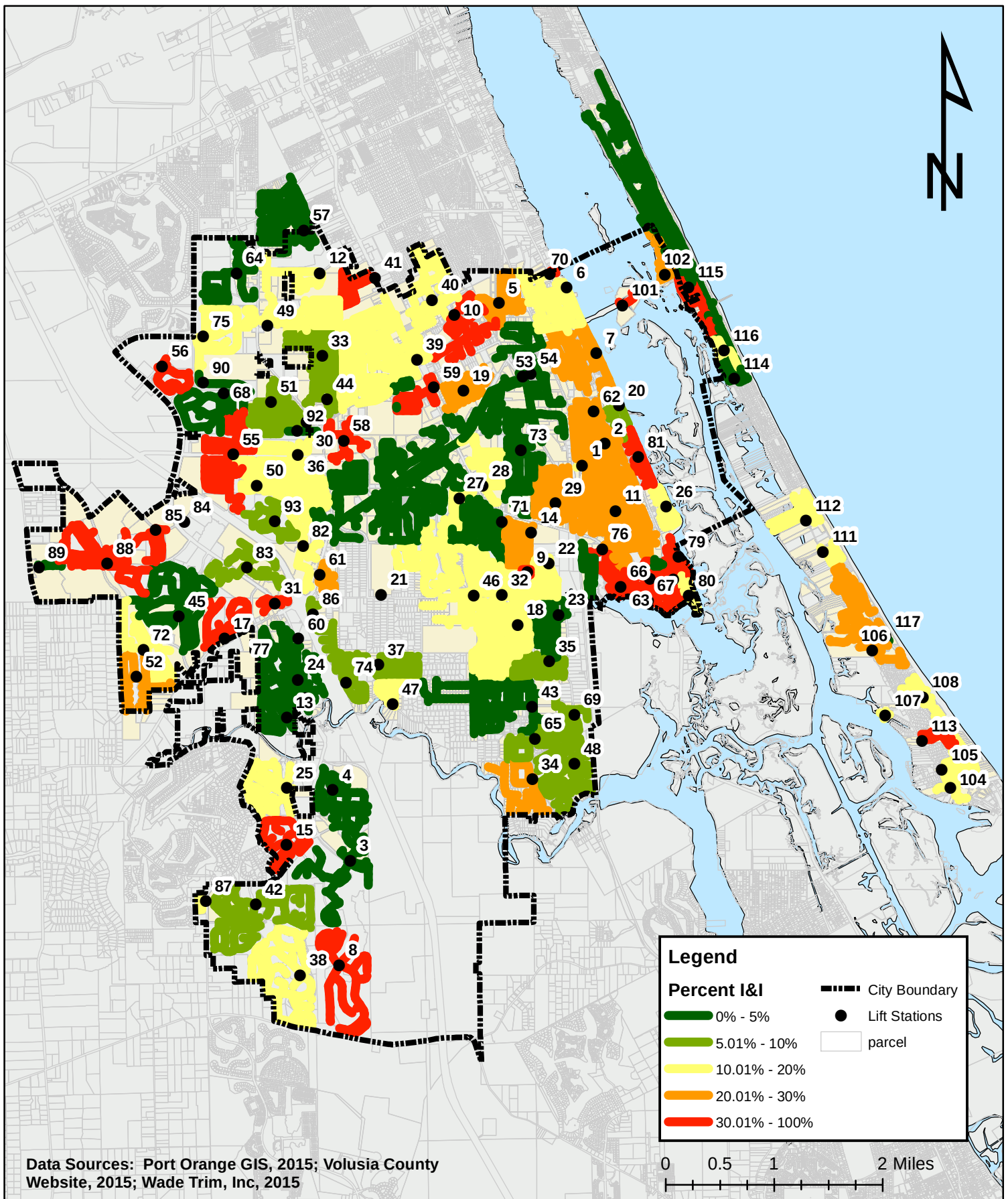
Table 3-3 looks at the total daily I&I but does not take into account the size of the tributary area and the amount of infrastructure in each area. A second way to look at the excess flow is by comparing the I&I to the total lift station flow and determining the percentage of flow that is I&I. **Table 3-4** ranks the top twenty (20) lift stations by percent I&I. The complete listing of lift stations and their total I&I (in gpd) can be found in **Appendix C**.

Table 3-3. Lift Station Listing, Ranked by Percent I&I

#	Lift Station Name	Total Calculated Flow (gpd)	Total Calculated I&I (gpd)	Percent I&I
LS-115*	Surfside	7,844	5,848	75%
LS-9	Halifax Estates	5,395	3,824	71%
LS-76*	Baywood	3,713	2,438	66%
LS-88	Coraci	59,004	30,739	52%
LS-78	East Basyshore	9,408	4,891	52%
LS-10*	Nixon/Biro	27,163	13,406	49%
LS-84	Williamson Business Park	1,045	514	49%
LS-41	Lamplighter	72,931	35,714	49%
LS-101*	Seabird Island	35,282	17,012	48%
LS-70*	Intracoastal Villas	5,716	2,690	47%
LS-81*	Commonwealth	6,820	2,915	43%
LS-8	Cypress Head #2	61,535	25,592	42%
LS-85	Plantation #1	16,163	6,031	37%
LS-21	Spruce Creek High	3,035	1,131	37%
LS-15	Sabal Creek	14,334	5,338	37%
LS-58	City Hall	13,968	5,056	36%
LS-17	Vineyards	12,009	4,345	36%
LS-55	Glenwood Village	53,498	18,725	35%
LS-79	Riverside	6,510	2,257	35%
LS-77	Windsor Hills	5,609	1,922	34%

* Identified by City Staff as experiencing excessive I&I

Figure 3-3 provides a map of the areas based on the percent I&I in each tributary area.



4.0 SUMMARY OF RESULTS & RECOMMENDATIONS

4.1 Summary

The purpose of this study was to confirm that there is inflow & infiltration occurring within the sanitary collection system and to identify locations (lift station tributary areas) where the highest probability of I&I is occurring. Through the analysis of the RWP and the City-owned lift stations, there is a significant amount of I&I impacting the system.

The water and wastewater treatment plant analysis in **Section 2.0** demonstrates that there is approximately 1.810 MGD of excess water entering the collection system and being processed through the RWP. This accounts for 28% of the wastewater entering the RWP. Furthermore, the analysis shows the significant impact of rainfall on the RWP, with the largest rain event in the study period resulting in wastewater flows 2.5 times the calculated baseline flow.

The lift station run time analysis performed in **Section 3.0** reinforces the idea that I&I is prevalent in the system by finding at least 849,000 gpd of excess water entering the collection system. The estimation of I&I at the lift stations is lower than the findings of **Section 2.0** based on the following:

1. 50+ private lift stations were not included in the analysis. These lift stations and their associated service connections vary in capacity and serve different types of customers, including businesses of all sizes, multi-family homes, parks and government entities. Each PLS may be contributing various levels of I&I to the collection system.
2. Background infiltration in the collection system is difficult to isolate and calculate without actual field measurements of groundwater elevations and actual wastewater flows; therefore, the baseline flow at each lift station most likely includes water infiltration that appears to be wastewater in the run time analysis.
3. As discussed in **Section 3.4** (Estimation of Lift Station Flows), the analysis assumes that the pumps in each lift station are operating at their design duty points.

4.2 Comparison to Staff Memorandum

The results of this study echo the sentiments of the Staff Memorandum: inflow & infiltration exists in the collection system. Different methodologies were employed to determine the plant baseline flows and similar baselines were established. This study took a step further by comparing total potable water usage to incoming wastewater flows, thereby highlighting the disparity between the two.

The lift station run time analysis yielded similar results as well. Of the twenty (20) lift stations identified in the study as having the most daily I&I, Twelve (12) were noted in the Staff memorandum as having excessive I&I. The quantities vary between study and the memorandum, primarily due to the methodologies employed to determine baselines and wet weather peaking factors and to exclude re-pumped wastewater flows from the re-pump lift stations.

4.3 Rehabilitation & Replacement Recommendations

Now that excessive I&I has been quantified for each lift station (**Section 3.0**), the rehabilitation & repair (R&R) projects must be prioritized so that I&I is eliminated in an efficient and cost-effective manner. The City currently smoke tests and performs camera surveys to find leaking infrastructure. To date, approximately 120,000 linear feet of gravity sewer (9% of total sewer) has been lined. Though the City has been proactive in searching for leaking infrastructure and illegal cross-connections, more resources need to be dedicated to the effort.

The costs to correct I&I can be significant and careful consideration must be made to allocate resources to get the most I&I reduction by spending the least amount of capital. In this analysis, total repair costs were calculated per tributary area by summarizing the collection system components within each tributary area that contribute to I&I. The components of the cost analysis include:

1. Gravity Sewers. Smoke and television testing is to be performed on all gravity sewers. Repairs include spot patching, sliplining, CIPP (cured-in place pipe) lining, or open excavation to replacement pipe segments.
2. Manholes. All manholes will be visually inspected for defects. Repairs will vary and may include lid/cover replacement, lid leveling, collar repair, patching of cracks, or application of spray/structural lining or full manhole replacement.
3. Cleanouts and Laterals. Cleanouts and laterals will be smoke tested. Repairs may include lateral replacement (owner-side and/or property-side), lateral patching, replacement of cleanout caps and repair of broken cleanouts. Residents that are found to have an illegal cross-connection (i.e. house downspout connected directly to sanitary sewer) shall be notified to remove the connection.

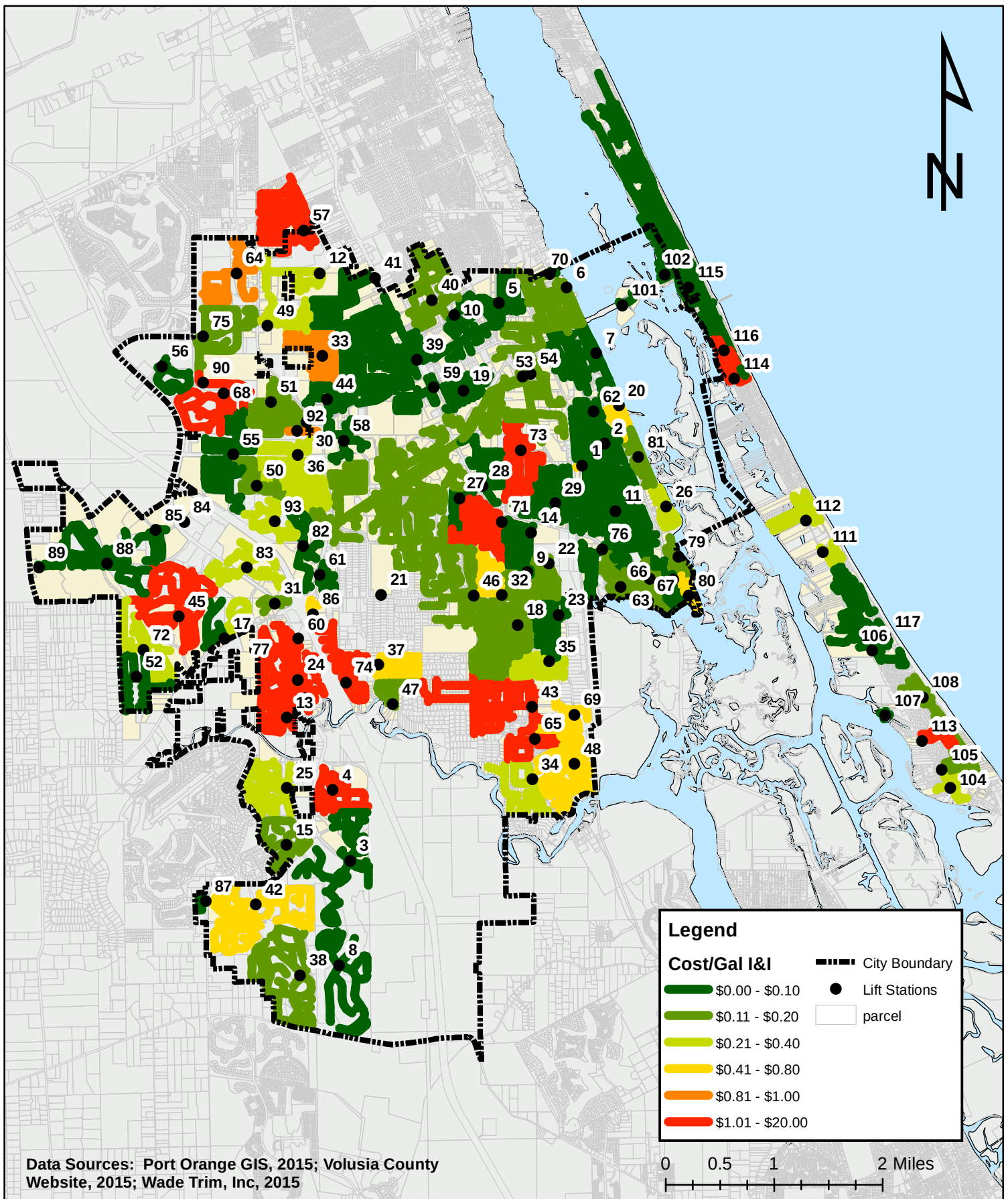
Once the costs were determined, they were divided by the gallons per year (gpy) I&I to calculate cost per gallon. These repair costs per gallon of I&I have been summarized in **Table 4-1**. Only the top-ranked are shown in this table; the complete listing ranked by cost per gallon I&I can be found in **Appendix D**.

Table 4-1. Lift Station Listing, Ranked by Repair Cost per Gallon I&I

#	Lift Station Name	Estimated Inspection & Repair Cost (gpy)	Total Calculated I&I (gpy)	Repair Cost per Gallon I&I
LS-101*	Seabird Island	\$ 95,777	6,209,284	\$ 0.015
LS-7*	Barnett Bank	\$ 450,594	19,733,563	\$ 0.023
LS-102*	Coral Way	\$ 158,509	6,723,667	\$ 0.024
LS-41	Lamplighter	\$ 308,953	13,035,748	\$ 0.024
LS-106*	Ponce Inlet Master	\$ 524,017	20,466,743	\$ 0.026
LS-61	Super Car Wash	\$ 67,576	2,299,555	\$ 0.029
LS-70*	Intracoastal Villas	\$ 29,975	981,776	\$ 0.031
LS-76*	Baywood	\$ 27,696	889,960	\$ 0.031
LS-9	Halifax Estates	\$ 53,502	1,395,642	\$ 0.038
LS-82	Lowe's / Gateway	\$ 154,744	3,887,388	\$ 0.040
LS-5*	Charles Street	\$ 276,543	6,770,297	\$ 0.041
LS-29*	Maplewood	\$ 523,107	12,140,317	\$ 0.043
LS-62*	Anglers	\$ 52,369	922,590	\$ 0.057
LS-8	Cypress Head #2	\$ 534,593	9,341,193	\$ 0.057
LS-107*	Deep Water Landing	\$ 42,067	730,144	\$ 0.058
LS-88	Coraci	\$ 675,406	11,219,886	\$ 0.060
LS-14*	Parkwood	\$ 469,749	7,170,198	\$ 0.066
LS-39	Nova & Hebert	\$ 1,708,939	26,053,665	\$ 0.066
LS-58	City Hall	\$ 121,956	1,845,298	\$ 0.066
LS-87	Whispering Woods	\$ 25,287	368,732	\$ 0.069

* Identified by City Staff as experiencing excessive I&I

Figure 4-1 provides a map of the areas based on the inspection/repair cost per gallon of I&I in each tributary area.



4.4 Development of Capital Improvement Projects

Using the lift station rankings and repair recommendations from **Section 4.1**, the City has developed a 5-Year I&I CIP program to address I&I. The goal is to spend \$2M per year to eliminate I&I in the identified lift station tributary areas. **Table 4-2** provides a summary of the 5-Year CIP program. The proposed CIP program has been provided in **Appendix E**.

Table 4-2. 5-Year I&I CIP Program

FISCAL YEAR 2017			
LS #	Name / Designation	I&I, gpy	I&I, gpd
LS-101	Sea Bird Island	6,209,284	17,012
LS-70	Intracoastal Villas	981,776	2,690
LS-7	Faith Worship Center / Barnett Bank	19,733,563	54,065
LS-41	Lamplighter	13,035,748	35,714
LS-5	Charles Street	6,770,297	18,549
LS-102	Coral Way	6,723,667	18,421
I&I to Eliminate in FY17		53,454,334	146,450
FISCAL YEAR 2018			
LS #	Name / Designation	I&I, gpy	I&I, gpd
LS-29	Maplewood	12,140,317	33,261
LS-23	Cambridge Villas	3,654,806	10,013
LS-76	Baywood	889,960	2,438
LS-107	Deep Water Landing	730,144	2,000
LS-106	Ponce Inlet Master	20,466,743	56,073
LS-19	Beacon Woods	3,343,223	9,160
I&I to Eliminate in FY18		41,225,194	112,946
FISCAL YEAR 2019			
LS #	Name / Designation	I&I, gpy	I&I, gpd
LS-9	Halifax Estates	1,395,642	3,824
LS-61	Altimira / Super Car Wash	2,299,555	6,300
LS-14	Parkwood	7,170,198	19,644
LS-11	Christiancy	20,492,797	56,145
I&I to Eliminate in FY19		31,358,192	85,913
FISCAL YEAR 2020			
LS #	Name / Designation	I&I, gpy	I&I, gpd
LS-88	Coraci / Plantation #2	11,219,886	30,739
LS-30	Ravenwood	696,214	1,907
LS-82	Lowe's / Gateway	3,887,388	10,650
LS-8	Cypress Head #2	9,341,193	25,592
I&I to Eliminate in FY20		25,144,680	68,890
FISCAL YEAR 2021			
LS #	Name / Designation	I&I, gpy	I&I, gpd
LS-62	Anglers	922,590	2,528
LS-39	Nova / Hebert	26,053,665	71,380
I&I to Eliminate in FY21		26,976,255	73,908
5-YEAR CIP I&I Elimination Goal		178,158,655	488,106

(1) Priority is based from Wade Trim report and Utilities Staff recommendations

Table 4-2 provides the estimated savings at the lift stations and the WWTP should the City successfully eliminate 100% of the I&I in the targeted lift station tributary areas. Potential energy savings are discussed in more detail in **Section 5.4**.

Table 4-2. 5-Year I&I CIP Program – Estimated Energy Savings

Fiscal Year	Estimated Lift Station Savings (\$/year)	Estimated WWTP Savings (\$/year)
2017	\$2,405	\$13,619
2018	\$3,594	\$10,009
2019	\$2,305	\$7,220
2020	\$3,030	\$6,399
2021	\$14,017	\$6,399
Total⁽¹⁾⁽²⁾	\$25,351	\$43,646

(1) Assumes 100% I&I reduction for the targeted lift stations in each FY.

(2) Actual Savings will vary depending on the cost of electricity and treatment chemicals.

By eliminating I&I throughout the collection system, the City may be able to avoid an unnecessary WWTP expansion or the construction of a new facility. **Table 4-3** provides a summary of the potential savings should 100% of the I&I be eliminated during the 5-Year I&I CIP program. The sizing is based on the reduction of I&I (0.488 MGD) with a peaking factor of 2.5. Plant cost avoidance is discussed in more detail in **Section 5.5**.

Table 4-2. 5-Year I&I CIP Program – Plant Expansion Cost Avoidance

1.2 MGD Plant Expansion / New Facility ⁽¹⁾	Anticipated Cost (in Millions)
Design / Construction Administration	\$1.5 - \$2.0
Construction	\$14.0 - \$15.0
5-Year I&I CIP Program Funding	\$10.0
Estimated Potential Savings	\$5.5 - \$7.0

(1) Based on 0.488 MGD facility with a 2.5 peaking factor.

4.5 Future Inflow & Infiltration Monitoring

While the City inspects and repairs the collection system based on the results of this Study, several steps can be taken to further isolate the areas where I&I is impacting the system the most and to reallocate resources as needed to address it.

1. Force Main & Gravity Sewer Flow Monitoring. While the historical data analysis performed in this Study provides insight on the amount of I&I in the system, field monitoring of wastewater flows over an extended period of time (3-12 months) before, during and after rain events can

provide real-time feedback. Ultrasonic-type flow meters can be used in gravity sewers while strap-on magnetic flow meters can be placed on force mains.

2. Rain Gauges. The City now has two (2) rain gauges. One is located at the WTP and the other at the reclaimed water reservoir. To provide better coverage, the City should also install rain gauges at other locations, such as at lift stations at remote locations.
3. Piezometer wells. While rainfall is a major contributor to I&I, daily infiltration can be difficult to isolate in areas where pipes are continuously submerged by the groundwater. Piezometers can be installed in strategic locations to monitor the water table and compare the water levels to the daily flow entering a lift station.

5.0 BENEFITS

5.1 General

As demonstrated throughout this report, sources of I&I add unwanted water loads to sanitary sewer system. Any reduction in the amount of stormwater and/or groundwater entering the sanitary sewer system is a public benefit to all customers of the City of Port Orange. The following section will discuss the benefits of correcting I&I throughout the system.

5.2 Environmental Pollution Prevention

By correcting I&I within the City, the occurrences of unintentionally environmental pollution, via sewer overflows can be minimized. These overflows can spill onto roads and bodies of waters, thus posing a health hazard to residents and wildlife. During a significant rain event, there is a greater potential for overflows to occur that can back up into businesses and homes, resulting in damages to property and costly cleanup activities.

While overflows at the surface can occur, exfiltration may also be occurring beneath the surface. Exfiltration refers to a loss of sewage from the sanitary sewer system as the result of percolation or absorption into the surrounding soil through damaged infrastructure (pipes, manholes, etc). Exfiltration is typically a concern in locations where infrastructure is above the normal groundwater table. Most manholes and sewers within the City of Port Orange are typically below the groundwater table. This means that the hydrostatic pressure exerted on the pipes/walls will force water into the pipes instead of allowing sewage to leave the pipes. When the water table is lower than normal; however, the sewage can leak through damaged points in the system and into the groundwater. This sewage can contaminate groundwater, which is typically used as a source of drinking water. This polluted groundwater can end up migrating into surficial water bodies.

Elimination of surface overflows and exfiltration will provide the obvious benefit of protecting the environment and public from potentially hazardous pollution.

5.3 Preventative Maintenance & Emergencies

As water infiltrates/exfiltrates through damaged collection system infrastructure, the soils surrounding the pipe become destabilized. When the soil conditions change, the damage to existing infrastructure can be exacerbated. Eventually, this soil disturbance will result in a total collapse of the infrastructure and/or the creation of sinkholes. Knowing that a majority of the gravity sewer pipes and manholes are located within the City's streets, it is critically important to monitor and avoid total failures of the infrastructure.

It is advantageous to inspect and repair leaking gravity sewer pipes prior to a collapse as the cost is much cheaper (\$36/LF in-house) than performing an emergency replacement. Replacing a collapsed sewer can cost \$175-\$350/LF, which includes emergency mobilization, excavation, pipe materials, and roadway restoration. A failing manhole may cost \$2,060 to inspect and perform basic repairs while the removal and replacement of a collapsed manhole can cost \$4,000 or more. Repair costs are important when deciding to address the issue, but it's very important that the collection system components are physically sound as most gravity sewers and manholes are located in public right-of-ways and in roads.

Continued smoke testing and closed-circuit television (CCTV) surveys will help the City identify points of failure and perform the needed maintenance. This work will help the City avoid costly repairs, avoid environmental pollution and ensure the protection of the public from the potential health hazards.

In addition to the emergencies experienced in the collection system, prolonged rainfall events have the potential to disrupt the biological processes of the reclaimed water plant. Though it is less common, a severe disruption could result in a plant upset. The plant recovery depends on the severity of the upset. In extreme cases, biosolids must be purchased from a 3rd party in an attempt to recover the process. When the treatment process is severely disrupted, the effluent quality may not meet permit requirements. Then, storage of non-compliant effluent becomes an issue. It can take weeks to fully recover from a plant upset.

5.4 Energy and Treatment Cost Savings

The costs associated with excessive I&I throughout a sanitary sewer system can be large and may not be fully realized until the data is analyzed. The following subsections will discuss the potential cost savings at the treatment plant and at the lift stations.

5.4.1 Treatment Plant

The general rule of thumb is that the average utility spends \$1.00 to \$2.00 per thousand gallons (tgals) to treat municipal wastewater. The primary contributors to these costs are electricity, chemicals, sludge treatment and O&M labor. A change of 1% cost in electricity or chemicals can have a significant impact to the treatment cost, especially as the size of the plant increases.

Five (5) I&I reduction scenarios have been presented in **Table 5-1**. The initial quantity of I&I (1.798 MGD) is based on the total system I&I calculated in **Section 2.0**. Cost savings have been calculated by assuming that the variable costs (25%) decrease proportionally as the total I&I is reduced.

Table 5-1. Reclaimed Water Plant Cost Savings per Percent I&I Reduction

I&I Reduction Scenario	I&I per Scenario (MGD)	Cost Savings	
		Daily	Yearly
0% I&I Reduction	1.798	-	-
10% I&I Reduction	1.618	\$45	\$16,409
25% I&I Reduction	1.349	\$112	\$41,022
50% I&I Reduction	0.899	\$225	\$82,044
75% I&I Reduction	0.450	\$337	\$123,066
100% I&I Reduction	0.000	\$450	\$164,088

5.4.2 Lift Stations

Similar to a treatment plant, there are fixed and variable costs for a lift station. O&M labor is typically unaffected by the amount of sewage pumped from a lift station though additional staff may be called upon to manage the system during significant rain events. Pumps are designed to cycle several times an hour and run for extended periods of time; therefore, maintenance/replacements are also considered routine costs. The pump run times and energy usage; however, can be significantly reduced as I&I is corrected in the system.

Five (5) I&I reduction scenarios have been presented in **Table 5-2**. The initial power usage (3,063 kW-hr) is based on the analysis performed in **Section 3.0**. Cost savings have been calculated by assuming that the current power cost is \$0.12 per kW-hr.

Table 5-2. Lift Station Energy Savings per Percent I&I Reduction

I&I Reduction Scenario	Lift Station Power Usage (kW-hr)	Cost Savings	
		Daily	Yearly
0% I&I Reduction	3,063	-	-
10% I&I Reduction	2,977	\$10	\$3,767
25% I&I Reduction	2,848	\$26	\$9,416
50% I&I Reduction	2,633	\$52	\$18,833
75% I&I Reduction	2,418	\$77	\$28,250
100% I&I Reduction	2,203	\$103	\$37,666

5.5 Treatment Plant Capacity & Cost Avoidance

5.5.1 Permitted Capacity & Statutory Thresholds

The RWP is permitted to treat up to 12 MGD and the average daily flow entering the plant for the analyzed period was 6.414 MGD. While it seems that there is plenty of excess treatment capacity, the reality is that the excess I&I entering the collection will potentially result in the premature triggering of statutory requirements in the operating permit during the next permit renewal cycle. If the three-month average daily flow exceeds 50% of the permitted capacity of the treatment plant, planning for wastewater facilities expansion must be initiated in accordance with Rule 62-600.405, FAC. The three-month average daily flow for the year 2014 was 6.251 MGD, which exceeds the trigger threshold of 6.0 MGD. During the next permitting cycle, the City will be required to acknowledge that the planning for plant expansions will need to begin. By eliminating I&I in the system, the City would have avoided the time and costs associated with planning for this unneeded plant expansions. As the City works to eliminate I&I, the plant expansions may be delayed until absolutely necessary.

5.5.2 Facility Expansion Cost Avoidance

If I&I is left unmanaged and new customers continue to connect to the system, there may be the need to perform a plant expansion. Typical upgrades include upsizing screens and grit removal components, pumps, mixers and construction of new tanks (i.e. equalization basins, clarifiers, secondary treatment basins). Should there be no more room for expansion at the RWP, a new facility would be required.

Planning, design, permitting and construction for plant expansions and new facilities are very costly. The costs can vary and will be heavily dependent on the chosen treatment technologies, availability of land, and the amount of wastewater the plant will be required to treat. **Table 5-3** provides the conceptualized construction cost estimates for three (3) plant capacity scenarios.

Table 5-3. Facility Expansion and Construction Costs

Facility Expansion	Capacity (MGD)	Cost ⁽¹⁾⁽²⁾ (\$)	Cost per Gallon (\$/gal)
	1.0	\$ 14,447,065	\$ 14.45
	1.8	\$ 16,848,514	\$ 9.36
	2.0	\$ 17,448,876	\$ 8.72
New Facility	Capacity (MGD)	Cost ⁽¹⁾⁽³⁾ (\$)	Cost per Gallon (\$/gal)
	1.0	\$ 10,617,038	\$ 10.62
	1.8	\$ 14,483,675	\$ 8.05
	2.0	\$ 15,450,334	\$ 7.73

(1) Pricing based on Best-fit Equation from Table 12.6 (Summary of Reported BNR Capital Costs), Biological and Chemical Systems for Nutrient Removal, 1994. Costs escalated to June 2015 using ENR Construction Index (10039). Costs do not include Planning, engineering or permitting.

(2) Facility Expansion Equation: $395Q + 5.70 \times 10^6$, $Q = \text{m}^3/\text{d}$

(3) New Facility Construction Equation: $636Q + 2.88 \times 10^6$, $Q = \text{m}^3/\text{d}$

The conceptual construction costs for an additional 1.0-2.0 MGD of capacity can range from \$10.7M to \$17.5M. As discussed in **Section 4.4**, the City has programmed approximately \$2M per year in an effort to reduce I&I. At the end of the 5-Year CIP, the City will have spent \$10M to eliminate 0.5 MGD of I&I as opposed to spending up to \$14.5M to expand the facility capacity to account for the excess flows and their associated peaking factors.

5.6 Collection System Capacity

The impact to the capacity of the collection system is important as well. Excess flows throughout the system can result in surcharging of gravity sewers and prolonged pump run times at the lift stations. Lift station pumps that were designed to handle small amounts of I&I may not be able to pump the excess flows, resulting in expensive upsizing of pumps. The upsizing of pumps will alter the design conditions of the lift station and will impact pressures and velocities of the existing force mains, potentially requiring the resizing of the force main. This chain reaction of events can be avoided when I&I is eliminated.

6.0 APPENDICES

Appendix A



Memorandum

To: Gregory A. Kisela, City Manager
CC: Shannon Lewis, Assistant City Manager
From: Jason Yarborough, Public Utilities Director
Subject: **Collection System Inflow and Infiltration Report**
Date: June 5, 2014

A handwritten signature in black ink, appearing to be 'JY', is located to the right of the memorandum header.

Introduction

This analysis looks at the inflow and infiltration (I&I) of the City of Port Orange wastewater collection system from two perspectives, the first is a system wide view and the second is a more detailed examination of individual collection areas. The system wide analysis examines city wide rainfall data, as well as total influent flow to the reclaimed water plant. This viewpoint gives an average I&I for the entire collection system. The other viewpoint in this analysis is of selected collection areas that have been identified by staff with potentially high levels of I&I. This gives a neighborhood level perspective of the inflow and infiltration. Inflow and Infiltration is when groundwater and stormwater enter the sewer collection system through broken sewer pipes, manholes and cleanouts. These extra water sources dilute the influent reducing the efficiency of operations at the reclaimed water plant; they also cause increased pumping and chemical costs.

Data

The rainfall data was collected from monthly operating reports from the Port Orange Water Plant and the Reclaimed Water Plant as well as the Reclaimed Reservoir in the Central Wellfield. The wastewater influent data was referenced from the reclaimed water plant monthly operating reports for the period specified.

For a more detailed analysis, 38 lift stations/wastewater collection areas were recently identified as being areas with potentially excessive I&I. The total lift station runtimes were referenced from our Lift Station telemetry database. The runtimes for the lift station pumps were added together to get a total daily runtime for each representative lift station. The actual sewage flows were then estimated based on the pump runtimes and each particular pump rating (in gallons per minute).

Analysis

The baseline flow condition for the entire collection system was determined by averaging the flow for the lowest four months during the period of evaluation (May 1, 2013 to April 30, 2014). The difference

between the baseline flow and the actual flow into the reclaimed water plant was then determined by direct subtraction and the additional I&I flow rates were computed.

During the dry months, a negative inflow rate was observed. A negative inflow rate indicates that wastewater is leaving the collection system rather than coming into the system. Wastewater leaving the system would be predominately from cracks in the collections system and from porous (clay) pipes within our collection system, which exist above the groundwater table during that period. This flow is minimal.

For the same period of evaluation, the runtime for each wastewater system was gleaned directly from our lift station telemetry data and then evaluated. The baseline flow was established as the lowest tenth percentile of the daily runtimes observed in the period of examination. Occasionally pump floats get stuck and send signals to the pump telling it to run unnecessarily, these points were considered outliers and removed from the data set and replaced with the previously determined baseline runtime. The difference between the baseline runtimes and the observed actual recorded runtimes was then assumed to be due to additional inflow and infiltration. Based on this difference in runtime an estimated gallons of inflow and infiltration was then able to be quantified and illustrated below.

Conclusions

The heavy rains in the summer of 2013 resulted in an elevated water table. When the water table submerges the pipes, the opportunity for water to enter the system through cracks and breaks greatly increases. This elevated infiltration rate can be seen as the large increase in flow in August 2013. As the rains subsided and the water table dropped, the infiltration rate decreased respectively and the influent flows returned to normal. The overall infiltration rate for the 12 months analyzed was a computed average of 9.1% above of the baseline influent flow. The highest month of August 2013 was an average of 52% above the baseline.

All of the 38 lift station areas exhibited I&I to varying degrees. Stations such as Venetian Way and Harbor Point had high but tolerable rates of inflow and infiltration, 15% and 17% respectively. Low flow stations such as Las Olas and Cardinal had high rates of I&I but the overall flow in gallons per day was low enough to not be of concern to staff. Finally, there are several stations of concern to staff, all have high rates and high flows of Inflow and Infiltration. These stations include Nixon / Biro, Christancy, Parkwood, Sleepy Hollow, Laurelwood and The Woods. Through continued efforts in the linings of our collections system pipe lines and rehabilitation efforts on leaking sanitary manholes, and sewer cleanouts the rate of inflow and infiltration can continue to be dramatically reduced.

The United States Environmental Protection Agency (US EPA) considers Inflow and Infiltration to be excessive when total daily wastewater flow exceeds 120 gallons per capita per day. Using this metric the highest acceptable level of flow for our city with a population of 60,000 would be approximately 7.2 Million Gallons per Day (MGD). After 4 months of high rainfall, the wastewater plant experienced an average daily flow of 8.875 MGD in August 2013. This is the only time during the period of examination that the system exceeded the recommended threshold suggested by the US EPA. When the EPA

criterion is converted to the units used for permitting, the unacceptable threshold is a 50% increase in flow.

It is staff's position that an average Inflow and Infiltration rate above 25% is unacceptable. Although we are currently below 10% system wide, of the 38 systems that were analyzed 15 exhibited an excessive level of I&I based on the EPA definition and 33 exhibited an excessive level of I&I based on staff recommended levels. Without continued reinvestment into the collection system our ability to management Inflow and Infiltration will diminish. Unacceptable levels of inflow and infiltration cause a myriad of costly repercussion from increased chemical costs and lost efficiency at the plant to elevated risk of costly damage and excessive wear and tear to the sewage collection system infrastructure.

Table 1: Inflow and Infiltration by LS area

Lift Station Name	Normal Daily Flow (Baseline)	Average Additional % Increase	Total Additional Flow (Gallons per day due to I&I)	Total Additional Flow (Gallons per Year due to I&I)	Number of Manholes in LS area	Linear Feet of Pipe in the LS area
Christancy	156,479	55%	86,261	31,485,182	225	55,733
Cambridge Estates	130,577	21%	27,243	9,943,800	177	46,020
Isabelle	66,937	45%	30,402	11,096,609	100	24,474
Barnett Bank	106,246	29%	31,134	11,363,816	117	24,363
P.I. Master	162,738	51%	82,852	30,241,112	122	24,065
Maplewood	74,436	45%	33,810	12,340,808	77	22,465
Oceans	43,886	20%	8,951	3,267,286	104	21,900
Sugar Forest	68,465	34%	23,588	8,609,520	84	18,575
Foxboro #2	33,943	21%	7,039	2,569,153	77	18,544
Laurelwood	15,033	88%	13,180	4,810,748	67	17,660
Nixon / Biro	57,707	54%	31,072	11,341,185	66	12,880
Parkwood	57,661	50%	28,634	10,451,413	48	12,868
Sleepy Hollow	32,095	77%	24,627	8,988,771	49	12,212
Charles St	65,109	31%	20,475	7,473,399	102	12,147
Woods	39,909	53%	21,333	7,786,548	41	10,173
Surfside	2,606	312%	8,143	2,972,038	43	8,500

Inlet Point	18,464	26%	4,826	1,761,384	41	8,314
Anchor Dr	8,654	36%	3,084	1,125,759	28	8,089
Cambridge Villas	73,720	45%	33,309	12,157,860	53	8,089
Brandy Hills	33,978	30%	10,039	3,664,168	30	7,695
Commonwealth	581	61%	356	129,899	38	7,283
Harbor Point	12,893	17%	2,193	800,445	29	7,007
Coral Way	47,431	31%	14,736	5,378,670	37	6,781
Lighthouse Shores	19,379	54%	10,516	3,838,220	31	6,569
Deep Forest	18,377	30%	5,598	2,043,386	23	6,070
Norman St	5,767	35%	2,003	731,154	21	5,500
Venetian Way	1,341	15%	201	73,501	38	5,490
Ravenwood	73,597	42%	30,558	11,153,593	30	5,135
Ocean Way	5,024	24%	1,219	444,885	20	4,595
Cardinal	530	31%	166	60,642	20	4,070
Las Olas	285	151%	431	157,181	17	3,450
Seagull Landing	5,843	49%	2,870	1,047,648	14	2,571
Anglers	6,079	29%	1,766	644,753	12	2,020
Seabird Island	19,528	37%	7,217	2,634,116	9	1,769
Buttermilk	2,014	61%	1,234	450,318	7	1,420
Baywood	1,527	68%	1,045	381,607	7	1,038
Intercostal Villas	2,842	62%	1,752	639,597	1	658
Deep Water Landings	4,670	116%	5,430	1,981,891	4	549

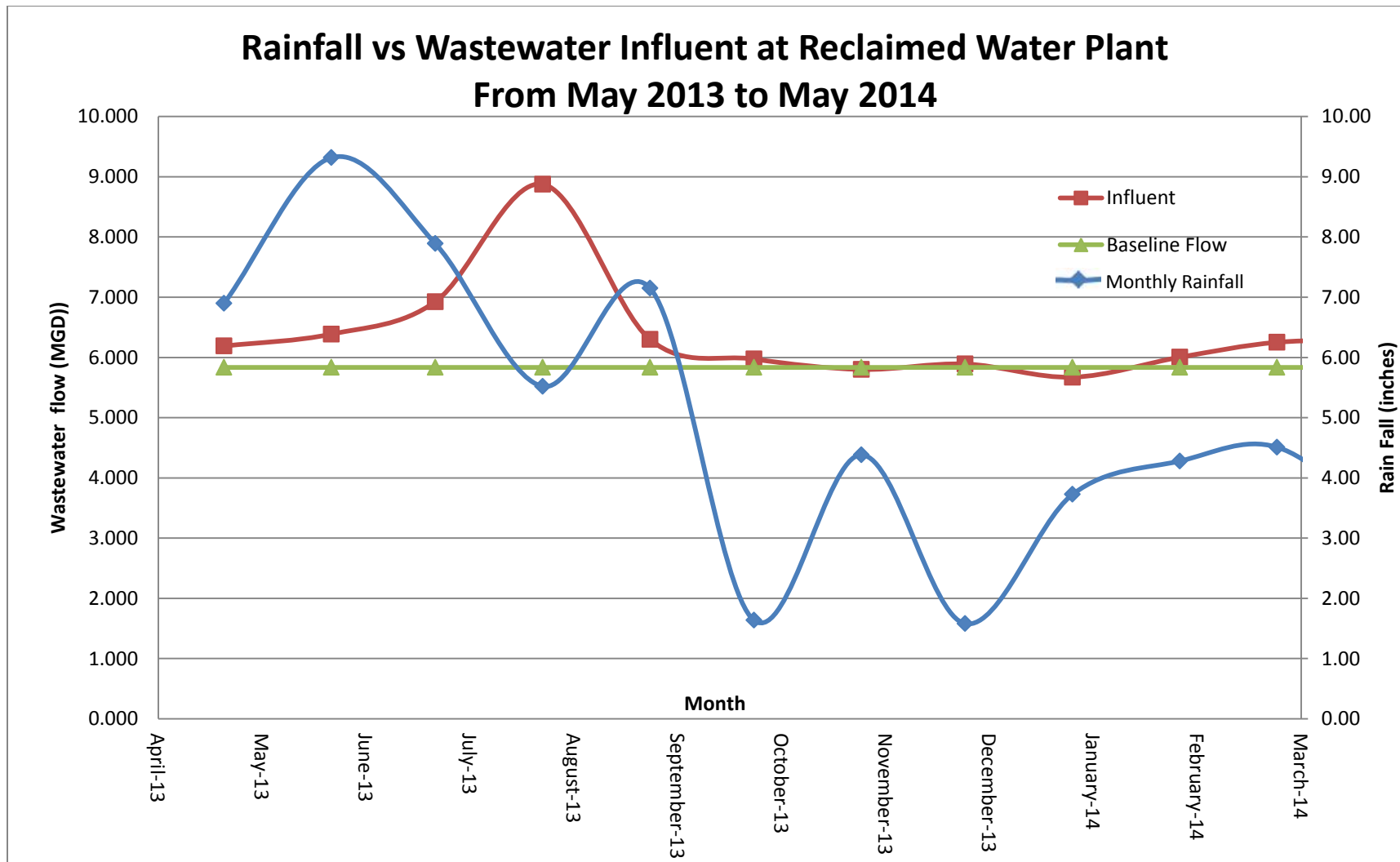


Figure 1 Comparison of baseline wastewater flow, reclaimed water plant influent flow and rainfall.

Appendix B

Appendix B - Summary of WTP / RWP Flows & Rainfall

	WATER TO SYSTEM			WATER TO SYSTEM		
Month	Tgals	gals	Mgals	MADF	Max Day	Min Day
May-14	187,472	187,472,000	187.472	6.047	7.046	5.129
Jun-14	185,713	185,713,000	185.713	6.190	7.825	5.403
Jul-14	185,837	185,837,000	185.837	5.995	6.594	5.370
Aug-14	183,253	183,253,000	183.253	5.911	7.152	4.873
Sep-14	174,358	174,358,000	174.358	5.812	6.883	4.829
Oct-14	180,416	180,416,000	180.416	5.820	6.572	4.920
Nov-14	171,142	171,142,000	171.142	5.705	6.554	5.081
Dec-14	173,099	173,099,000	173.099	5.584	6.269	4.996
Jan-15	174,981	174,981,000	174.981	5.645	6.062	5.211
Feb-15	161,564	161,564,000	161.564	5.770	6.435	5.056
Mar-15	203,391	203,391,000	203.391	6.561	8.002	5.574

	WASTEWATER TO PLANT	
Month	gals	Mgals
May-14	204,256,000	204
Jun-14	194,676,000	195
Jul-14	207,103,000	207
Aug-14	192,490,000	192
Sep-14	197,091,000	197
Oct-14	186,318,000	186
Nov-14	192,005,000	192
Dec-14	198,730,000	199
Jan-15	183,317,000	183
Feb-15	178,517,000	179
Mar-15	214,212,000	214

WASTEWATER TO PLANT		
MADF	Max Day	Min Day
6.589	7.193	5.788
6.489	6.933	5.822
6.681	7.913	5.598
6.209	7.007	5.204
6.570	15.886	5.160
6.010	7.920	4.934
6.400	12.296	4.469
6.411	7.246	5.532
5.913	6.560	4.826
6.376	7.360	5.736
6.910	7.636	6.215

	RAINFALL		
Month	Plant	Reservoir	Rainfall, Comb. Avg
May-14	3.2	3.2	3.2
Jun-14	3.1	5.8	4.45
Jul-14	11	8.45	9.725
Aug-14	5.4	4.6	5
Sep-14	16	8.7	12.35
Oct-14	0.7	0.8	0.75
Nov-14	10.35	6.6	8.475
Dec-14	3	2.6	2.8
Jan-15	2.81	2.5	2.655
Feb-15	3.1	2.35	2.725
Mar-15	0.9	1.35	1.125

Appendix C

**APPENDIX C. Lift Station Results
Flows and Costs**

LS #	LS Name	Total Flow, gpd (AADF)	Total Flow, Baseline, gpd (AADF)	I&I Total, gpd (AADF)	I&I Total, gpy	I&I Total (%)	Potential LS Energy Savings per year, \$0.12/kWh	Total Unlined Gravity Sewer	Total Manholes	Cleanouts & Laterals	Inspection & Repair Total	Repair Cost/gal I&I (per year)
LS-1	ZUBER	192	178	38	13,780	20%	\$0.62	296	1	4	\$6,386	\$0.46
LS-2	ISABELLE	91,677	80,976	20,289	7,405,362	22%	\$473.60	20,799	109	596	\$700,290	\$0.09
LS-3	CYPRESS HEAD # 1	75,520	76,082	0	0	0%	\$0.00	23,390	127	368	\$571,053	\$0.00
LS-4	STERLING CHASE	22,141	22,160	286	104,371	1%	\$6.67	11,787	61	210	\$303,773	\$2.91
LS-5	CHARLES STREET	90,464	80,394	18,549	6,770,297	21%	\$505.06	5,830	52	260	\$276,543	\$0.04
LS-6	OCEANS	53,670	50,047	6,968	2,543,378	13%	\$345.39	8,923	101	275	\$346,974	\$0.14
LS-7	BARNETT BANK	182,672	157,748	54,065	19,733,563	30%	\$813.66	11,784	110	372	\$450,594	\$0.02
LS-8	CYPRESS HEAD # 2	61,535	48,326	25,592	9,341,193	42%	\$658.96	20,307	97	384	\$534,593	\$0.06
LS-9	HALIFAX ESTATES	5,395	3,355	3,824	1,395,642	71%	\$69.41	2,254	3	41	\$53,502	\$0.04
LS-10	NIXON/BIRO	27,163	18,284	13,406	4,893,085	49%	\$1,067.27	14,883	68	246	\$364,259	\$0.07
LS-11	CHRISTIANCY	227,078	211,799	56,145	20,492,797	25%	\$1,799.39	37,760	237	1257	\$1,421,685	\$0.07
LS-12	ATLANTIC HIGH	5,124	5,242	880	321,323	17%	\$34.57	8,015	28	25	\$113,071	\$0.35
LS-13	SUMMERTREES SOUTH	17,097	16,967	453	165,341	3%	\$13.70	12,932	61	285	\$369,312	\$2.23
LS-14	PARKWOOD	92,029	84,786	19,644	7,170,198	21%	\$178.30	13,264	49	429	\$469,749	\$0.07
LS-15	SABAL CREEK	14,334	14,580	5,338	1,948,271	37%	\$444.92	10,716	52	197	\$278,506	\$0.14
LS-16	SAWGRASS POINT	8,869	9,069	97	35,451	1%	\$5.29	3,015	17	37	\$66,421	\$1.87
LS-17	VINEYARDS	12,009	11,213	4,345	1,585,744	36%	\$109.20	5,341	23	113	\$147,800	\$0.09
LS-18	CAMBRIDGE ESTATES	171,216	161,707	17,452	6,369,965	10%	\$316.80	34,957	176	890	\$1,091,681	\$0.17
LS-19	BEACON WOODS	41,031	36,562	9,160	3,343,223	22%	\$187.05	4,917	48	245	\$254,366	\$0.08
LS-20	NORMAN ST	5,699	5,600	507	185,115	9%	\$5.37	5,654	23	80	\$126,927	\$0.69
LS-21	SPRUCE CREEK HIGH	3,035	2,699	1,131	412,861	37%	\$46.20	1,500	10	15	\$31,500	\$0.08
LS-22	SOUTHERN PINE	39,205	36,515	5,578	2,035,853	14%	\$151.87	9,393	42	279	\$319,057	\$0.16
LS-23	CAMBRIDGE VILLA	204,160	202,455	10,013	3,654,806	5%	\$136.32	3,813	55	283	\$275,352	\$0.08
LS-24	SUMMERTREES	20,444	20,742	96	35,122	0%	\$2.62	21,184	117	580	\$697,244	\$19.85
LS-25	SANCTUARY GARDEN	46,195	46,908	4,822	1,759,977	10%	\$87.53	15,488	73	309	\$418,833	\$0.24
LS-26	HARBOR POINT	16,475	15,791	1,772	646,649	11%	\$38.59	6,516	29	204	\$228,831	\$0.35
LS-27	DEEP FOREST	27,954	26,003	4,675	1,706,354	17%	\$48.96	5,550	20	115	\$149,488	\$0.09
LS-28	SLEEPY HOLLOW	49,062	46,936	9,749	3,558,428	20%	\$102.10	12,575	49	203	\$299,181	\$0.08
LS-29	MAPLEWOOD	125,281	108,226	33,261	12,140,317	27%	\$345.02	13,034	74	485	\$523,107	\$0.04
LS-30	RAVENWOOD	27,795	28,045	1,907	696,214	7%	\$821.51	1,372	19	87	\$87,852	\$0.13
LS-31	WESTPORT SQUARE	3,851	3,345	1,203	439,192	31%	\$87.37	2,773	14	14	\$45,587	\$0.10
LS-32	FOXBORO #1	9,382	8,977	962	351,049	10%	\$52.38	8,759	31	163	\$222,175	\$0.63
LS-33	LAURELWOOD	23,969	24,410	1,629	594,435	7%	\$22.17	17,345	68	434	\$524,564	\$0.88
LS-34	GOLDEN POND EST	11,014	10,454	2,480	905,117	23%	\$59.58	12,407	51	150	\$260,318	\$0.29
LS-35	WOODS	62,663	62,068	3,460	1,263,079	6%	\$94.23	10,569	44	187	\$265,023	\$0.21
LS-36	WILLOW RUN #1	42,608	44,294	6,091	2,223,219	14%	\$1,350.61	27,984	107	563	\$745,219	\$0.34
LS-37	SWEETWATER HILLS	24,083	24,868	1,907	696,101	8%	\$86.55	10,030	39	219	\$279,968	\$0.40
LS-38	WATER'S EDGE #2	78,965	77,284	15,311	5,588,664	19%	\$940.41	26,588	131	599	\$772,108	\$0.14
LS-39	NOVA & HERBERT	643,718	657,190	71,380	26,053,665	11%	\$13,997.94	63,004	285	1274	\$1,708,939	\$0.07
LS-40	SUGAR FOREST	85,414	85,767	11,751	4,289,138	14%	\$529.80	18,793	85	458	\$566,282	\$0.13
LS-41	LAMPLIGHTER	72,931	56,577	35,714	13,035,748	49%	\$648.31	8,849	34	279	\$308,953	\$0.02
LS-42	WATERS EDGE #1	40,748	40,698	3,945	1,439,964	10%	\$861.40	29,189	151	528	\$757,993	\$0.53
LS-43	CENTRAL PARK	49,596	49,499	1,726	629,822	3%	\$39.15	31,404	130	466	\$722,039	\$1.15
LS-44	BRANDY HILLS	56,796	55,626	5,463	1,993,912	10%	\$40.57	7,555	30	148	\$198,961	\$0.10
LS-45	CRANE LAKES #1	39,747	40,199	283	103,190	1%	\$11.55	29,088	148	689	\$871,933	\$8.45
LS-46	COUNTRYSIDE	125,125	113,452	21,956	8,014,033	18%	\$298.92	35,647	162	719	\$966,033	\$0.12
LS-47	HAWKS RIDGE	17,209	16,750	3,196	1,166,395	19%	\$50.20	5,109	20	118	\$147,363	\$0.13

**APPENDIX C. Lift Station Results
Flows and Costs**

LS #	LS Name	Total Flow, gpd (AADF)	Total Flow, Baseline, gpd (AADF)	I&I Total, gpd (AADF)	I&I Total, gpy	I&I Total (%)	Potential LS Energy Savings per year, \$0.12/kWh	Total Unlined Gravity Sewer	Total Manholes	Cleanouts & Laterals	Inspection & Repair Total	Repair Cost/gal I&I (per year)
LS-48	RIVERWOOD	48,428	48,049	2,726	994,903	6%	\$101.21	23,847	120	474	\$648,158	\$0.65
LS-49	SOUTHWINDS	18,161	16,813	2,705	987,313	15%	\$49.10	10,994	47	210	\$287,642	\$0.29
LS-50	WILLOW RUN II	43,511	43,740	5,721	2,088,066	13%	\$62.31	9,899	37	212	\$272,415	\$0.13
LS-51	PICKWICK	72,513	69,640	6,731	2,456,836	9%	\$91.64	15,431	54	375	\$454,727	\$0.19
LS-52	FOREST LAKE	39,494	35,901	11,402	4,161,608	29%	\$362.40	11,130	46	246	\$314,468	\$0.08
LS-53	MASTER PUMP #1	NA	NA	NA	NA	NA						
LS-54	MASTER PUMP #2	1,245,248	1,238,989	40,788	14,887,712	3%	\$320.37	113,322	518	1448	\$2,465,490	\$0.17
LS-55	GLENWOOD VILLAGE	53,498	45,294	18,725	6,834,717	35%	\$509.87	24,024	92	464	\$625,834	\$0.09
LS-56	TOWN PARK	17,007	14,320	5,743	2,096,322	34%	\$178.73	5,877	36	137	\$178,226	\$0.09
LS-57	LA COSTA	84,548	83,595	1,707	623,015	2%	\$55.77	28,868	128	643	\$824,438	\$1.32
LS-58	CITY HALL	13,968	11,544	5,056	1,845,298	36%	\$55.06	6,657	25	58	\$121,956	\$0.07
LS-59	SAMMS AVE	26,133	25,151	8,673	3,165,630	33%	\$236.16	8,201	41	270	\$300,310	\$0.09
LS-60	CLARK'S	NA	NA	NA	NA	NA						
LS-61	SUPER CAR WASH	28,368	28,335	6,300	2,299,555	22%	\$257.32	4,077	21	21	\$67,576	\$0.03
LS-62	ANGLERS	9,860	8,373	2,528	922,590	26%	\$18.35	2,043	13	34	\$52,369	\$0.06
LS-63	LANCEWOOD	7,211	6,234	2,277	831,083	32%	\$122.37	5,815	26	110	\$152,046	\$0.18
LS-64	TOWNHOMES WEST	106,772	105,384	1,388	506,684	1%	\$27.49	14,543	76	347	\$438,969	\$0.87
LS-65	FALCON CREST	5,722	5,592	360	131,373	6%	\$19.60	8,013	34	143	\$202,202	\$1.54
LS-66	WEST BAYSHORE #2	12,586	11,135	3,848	1,404,377	31%	\$157.15	9,800	48	188	\$260,650	\$0.19
LS-67	WEST BAYSHORE #1	5,382	4,433	1,821	664,805	34%	\$97.88	3,369	15	67	\$90,423	\$0.14
LS-68	CROSS CREEK	20,219	20,258	207	75,466	1%	\$8.44	13,437	66	269	\$365,636	\$4.85
LS-69	OAKLAND PARK	13,010	12,800	831	303,228	6%	\$45.24	10,024	47	147	\$232,509	\$0.77
LS-70	INTRACOASTAL VILLAS	5,716	4,572	2,690	981,776	47%	\$14.65	559	1	33	\$29,975	\$0.03
LS-71	FOXBORO #2 (MILES)	37,514	36,913	1,262	460,562	3%	\$25.77	19,204	78	427	\$543,614	\$1.18
LS-72	CRANE LAKES #2	39,676	40,263	5,000	1,825,131	13%	\$163.39	13,221	59	307	\$386,880	\$0.21
LS-73	SHALLOW BROOK	37,052	37,404	817	298,378	2%	\$11.13	18,212	90	437	\$548,392	\$1.84
LS-74	SKY LAKE	13,080	13,246	699	255,285	5%	\$30.47	13,844	69	234	\$346,029	\$1.36
LS-75	GROVES	74,309	75,180	8,097	2,955,383	11%	\$146.98	17,565	82	338	\$465,509	\$0.16
LS-76	BAYWOOD	3,713	2,324	2,438	889,960	66%	\$131.03	997	7	19	\$27,696	\$0.03
LS-77	WINDSOR HILLS	5,609	5,210	1,922	701,365	34%	\$104.64	5,643	31	116	\$157,719	\$0.22
LS-78	EAST BAYSHORE	9,408	7,651	4,891	1,785,144	52%	\$262.84	5,597	30	92	\$139,271	\$0.08
LS-79	RIVERSIDE	6,510	6,003	2,257	823,814	35%	\$92.18	5,118	24	116	\$148,401	\$0.18
LS-80	CEDAR	4,718	4,577	552	201,648	12%	\$29.69	3,231	18	66	\$90,152	\$0.45
LS-81	COMMONWEALTH	6,820	5,405	2,915	1,064,002	43%	\$158.75	8,400	48	60	\$154,200	\$0.14
LS-82	LOWE'S / GATEWAY	57,200	56,458	10,650	3,887,388	19%	\$290.00	8,266	39	70	\$154,744	\$0.04
LS-83	PAVILION	27,310	27,657	1,460	533,035	5%	\$45.71	11,497	51	36	\$168,796	\$0.32
LS-84	WILLIAMSON BUSINESS PARK (H)	1,045	1,008	514	187,444	49%	\$32.90	500	5	10	\$15,125	\$0.08
LS-85	PLANTATION # 1	16,163	14,527	6,031	2,201,270	37%	\$291.94	6,617	31	146	\$188,966	\$0.09
LS-86	JOURNEY'S END	1,269	1,309	110	40,246	9%	\$9.01	1,148	5	10	\$21,443	\$0.53
LS-87	WHISPERING WOODS	8,498	8,370	1,010	368,732	12%	\$18.34	1,432	8	9	\$25,287	\$0.07
LS-88	CORACI	59,004	43,609	30,739	11,219,886	52%	\$1,258.65	21,316	99	563	\$675,406	\$0.06
LS-89	Not Built	NA	NA	NA	NA	NA	\$0.00	1,503	13	3	\$24,629	
LS-90	SUNSET COVE	7,516	7,504	153	55,982	2%	\$6.63	3,038	12	154	\$148,471	\$2.65
LS-91		NA	NA	NA	NA	NA						
LS-92	BUTTERMILK	2,792	2,719	108	39,537	4%	\$1.70	1,436	7	24	\$35,601	\$0.90
LS-93	BOURBON STREET	47,287	48,703	4,384	1,600,175	9%	\$71.62	9,666	49	294	\$336,794	\$0.21
LS-94		NA	NA	NA	NA	NA						

**APPENDIX C. Lift Station Results
Flows and Costs**

LS #	LS Name	Total Flow, gpd (AADF)	Total Flow, Baseline, gpd (AADF)	I&I Total, gpd (AADF)	I&I Total, gpy	I&I Total (%)	Potential LS Energy Savings per year, \$0.12/kWh	Total Unlined Gravity Sewer	Total Manholes	Cleanouts & Laterals	Inspection & Repair Total	Repair Cost/gal I&I (per year)
LS-95		NA	NA	NA	NA	NA						
LS-96		NA	NA	NA	NA	NA						
LS-97	NAUTICA LAKES	NA	NA	NA	NA	NA						
LS-98		NA	NA	NA	NA	NA						
LS-99		NA	NA	NA	NA	NA						
LS-100		NA	NA	NA	NA	NA						
LS-101	SEABIRD ISLAND	35,282	25,264	17,012	6,209,284	48%	\$161.59	1,672	8	103	\$95,777	\$0.02
LS-102	CORAL WAY	69,860	62,233	18,421	6,723,667	26%	\$259.44	6,383	36	103	\$158,509	\$0.02
LS-103		NA	NA	NA	NA	NA	\$0.00					
LS-104	OCEAN WAY P.I. #9	7,768	7,487	1,057	385,897	14%	\$28.79	4,882	23	84	\$122,300	\$0.32
LS-105	INLET POINT P.I. #8	17,621	16,744	3,364	1,227,875	19%	\$27.48	8,671	45	137	\$210,867	\$0.17
LS-106	PONCE INLET MASTER	219,314	194,343	56,073	20,466,743	26%	\$2,767.62	25,171	126	280	\$524,017	\$0.03
LS-107	DEEP WATER LANDING	12,166	11,809	2,000	730,144	16%	\$26.15	871	4	43	\$42,067	\$0.06
LS-108	LIGHTHOUSE SHORES P.I. #6	35,100	34,778	4,821	1,759,550	14%	\$52.50	7,905	38	289	\$309,399	\$0.18
LS-109		NA	NA	NA	NA	NA						
LS-110		NA	NA	NA	NA	NA						
LS-111	SEAGULL LANDING P.I. #3	11,236	10,758	1,319	481,306	12%	\$17.95	2,911	18	109	\$118,207	\$0.25
LS-112	ANCHOR DR P.I. #2	11,938	11,260	1,351	493,027	11%	\$22.07	4,218	29	183	\$191,201	\$0.39
LS-113	LAS OLAS	723	677	246	89,803	34%	\$13.40	3,401	17	76	\$98,460	\$1.10
LS-114	VENETIAN WAY SOUTH	1,582	1,584	31	11,414	2%	\$1.70	5,339	39	91	\$141,430	\$12.39
LS-115	SURFSIDE	7,844	4,573	5,848	2,134,501	75%	\$318.47	8,913	43	134	\$209,852	\$0.10
LS-116	CARDINAL	738	675	139	50,839	19%	\$7.59	3,997	20	63	\$96,646	\$1.90
LS-117	OCEAN QUEST		NA	NA	NA	NA		570	2	57	\$47,383	

 RE-Pump Lift Station

Estimated Repair Costs:

Sewer Inspection - \$1 / LF

Sewer Lining - \$35 / LF

Manhole Inspection - \$60 / EA

Manhole Repair - \$2,000 / EA

Manhole Lid Insert - \$40 / EA

Cleanout / Lateral Inspections - \$100 / EA

Cleanout / Lateral Repair - \$2500 / EA

Appendix D

Appendix D. Lift Station Ranking by Repair Cost per Gallon I

LS #	Total Flow, MGD (AADF)	Total Flow, Baseline, MGD (AADF)	I&I Total (gal/Year)	I&I Total (%)	Repair Cost/gal I&I (per year)
LS-3	75,520	76,082	0	0%	\$0.000
LS-101	35,282	25,264	6,209,284	48%	\$0.015
LS-7	182,672	157,748	19,733,563	30%	\$0.023
LS-102	69,860	62,233	6,723,667	26%	\$0.024
LS-41	72,931	56,577	13,035,748	49%	\$0.024
LS-106	219,314	194,343	20,466,743	26%	\$0.026
LS-61	28,368	28,335	2,299,555	22%	\$0.029
LS-70	5,716	4,572	981,776	47%	\$0.031
LS-76	3,713	2,324	889,960	66%	\$0.031
LS-9	5,395	3,355	1,395,642	71%	\$0.038
LS-82	57,200	56,458	3,887,388	19%	\$0.040
LS-5	90,464	80,394	6,770,297	21%	\$0.041
LS-29	125,281	108,226	12,140,317	27%	\$0.043
LS-62	9,860	8,373	922,590	26%	\$0.057
LS-8	61,535	48,326	9,341,193	42%	\$0.057
LS-107	12,166	11,809	730,144	16%	\$0.058
LS-88	59,004	43,609	11,219,886	52%	\$0.060
LS-14	92,029	84,786	7,170,198	21%	\$0.066
LS-39	643,718	657,190	26,053,665	11%	\$0.066
LS-58	13,968	11,544	1,845,298	36%	\$0.066
LS-87	8,498	8,370	368,732	12%	\$0.069
LS-11	227,078	211,799	20,492,797	25%	\$0.069
LS-10	27,163	18,284	4,893,085	49%	\$0.074
LS-23	204,160	202,455	3,654,806	5%	\$0.075
LS-52	39,494	35,901	4,161,608	29%	\$0.076
LS-19	41,031	36,562	3,343,223	22%	\$0.076
LS-21	3,035	2,699	412,861	37%	\$0.076
LS-78	9,408	7,651	1,785,144	52%	\$0.078
LS-84	1,045	1,008	187,444	49%	\$0.081
LS-28	49,062	46,936	3,558,428	20%	\$0.084
LS-56	17,007	14,320	2,096,322	34%	\$0.085
LS-85	16,163	14,527	2,201,270	37%	\$0.086
LS-27	27,954	26,003	1,706,354	17%	\$0.088
LS-55	53,498	45,294	6,834,717	35%	\$0.092
LS-17	12,009	11,213	1,585,744	36%	\$0.093
LS-2	91,677	80,976	7,405,362	22%	\$0.095
LS-59	26,133	25,151	3,165,630	33%	\$0.095
LS-115	7,844	4,573	2,134,501	75%	\$0.098
LS-44	56,796	55,626	1,993,912	10%	\$0.100
LS-31	3,851	3,345	439,192	31%	\$0.104
LS-46	125,125	113,452	8,014,033	18%	\$0.121
LS-30	27,795	28,045	696,214	7%	\$0.126
LS-47	17,209	16,750	1,166,395	19%	\$0.126

Appendix D. Lift Station Ranking by Repair Cost per Gallon I

LS #	Total Flow, MGD (AADF)	Total Flow, Baseline, MGD (AADF)	I&I Total (gal/Year)	I&I Total (%)	Repair Cost/gal I&I (per year)
LS-50	43,511	43,740	2,088,066	13%	\$0.130
LS-40	85,414	85,767	4,289,138	14%	\$0.132
LS-67	5,382	4,433	664,805	34%	\$0.136
LS-6	53,670	50,047	2,543,378	13%	\$0.136
LS-38	78,965	77,284	5,588,664	19%	\$0.138
LS-15	14,334	14,580	1,948,271	37%	\$0.143
LS-81	6,820	5,405	1,064,002	43%	\$0.145
LS-22	39,205	36,515	2,035,853	14%	\$0.157
LS-75	74,309	75,180	2,955,383	11%	\$0.158
LS-54	1,245,248	1,238,989	14,887,712	3%	\$0.166
LS-18	171,216	161,707	6,369,965	10%	\$0.171
LS-105	17,621	16,744	1,227,875	19%	\$0.172
LS-108	35,100	34,778	1,759,550	14%	\$0.176
LS-79	6,510	6,003	823,814	35%	\$0.180
LS-63	7,211	6,234	831,083	32%	\$0.183
LS-51	72,513	69,640	2,456,836	9%	\$0.185
LS-66	12,586	11,135	1,404,377	31%	\$0.186
LS-35	62,663	62,068	1,263,079	6%	\$0.210
LS-93	47,287	48,703	1,600,175	9%	\$0.210
LS-72	39,676	40,263	1,825,131	13%	\$0.212
LS-77	5,609	5,210	701,365	34%	\$0.225
LS-25	46,195	46,908	1,759,977	10%	\$0.238
LS-111	11,236	10,758	481,306	12%	\$0.246
LS-34	11,014	10,454	905,117	23%	\$0.288
LS-49	18,161	16,813	987,313	15%	\$0.291
LS-83	27,310	27,657	533,035	5%	\$0.317
LS-104	7,768	7,487	385,897	14%	\$0.317
LS-36	42,608	44,294	2,223,219	14%	\$0.335
LS-12	5,124	5,242	321,323	17%	\$0.352
LS-26	16,475	15,791	646,649	11%	\$0.354
LS-112	11,938	11,260	493,027	11%	\$0.388
LS-37	24,083	24,868	696,101	8%	\$0.402
LS-80	4,718	4,577	201,648	12%	\$0.447
LS-1	192	178	13,780	20%	\$0.463
LS-42	40,748	40,698	1,439,964	10%	\$0.526
LS-86	1,269	1,309	40,246	9%	\$0.533
LS-32	9,382	8,977	351,049	10%	\$0.633
LS-48	48,428	48,049	994,903	6%	\$0.651
LS-20	5,699	5,600	185,115	9%	\$0.686
LS-69	13,010	12,800	303,228	6%	\$0.767
LS-64	106,772	105,384	506,684	1%	\$0.866
LS-33	23,969	24,410	594,435	7%	\$0.882
LS-92	2,792	2,719	39,537	4%	\$0.900

Appendix D. Lift Station Ranking by Repair Cost per Gallon I

LS #	Total Flow, MGD (AADF)	Total Flow, Baseline, MGD (AADF)	I&I Total (gal/Year)	I&I Total (%)	Repair Cost/gal I&I (per year)
LS-113	723	677	89,803	34%	\$1.096
LS-43	49,596	49,499	629,822	3%	\$1.146
LS-71	37,514	36,913	460,562	3%	\$1.180
LS-57	84,548	83,595	623,015	2%	\$1.323
LS-74	13,080	13,246	255,285	5%	\$1.355
LS-65	5,722	5,592	131,373	6%	\$1.539
LS-73	37,052	37,404	298,378	2%	\$1.838
LS-16	8,869	9,069	35,451	1%	\$1.874
LS-116	738	675	50,839	19%	\$1.901
LS-13	17,097	16,967	165,341	3%	\$2.234
LS-90	7,516	7,504	55,982	2%	\$2.652
LS-4	22,141	22,160	104,371	1%	\$2.911
LS-68	20,219	20,258	75,466	1%	\$4.845
LS-45	39,747	40,199	103,190	1%	\$8.450
LS-114	1,582	1,584	11,414	2%	\$12.391
LS-24	20,444	20,742	35,122	0%	\$19.852
LS-53	Repump Only	NA	NA	NA	NA
LS-60	Repump Only	NA	NA	NA	NA
LS-89	No Lift Station	NA	NA	NA	NA
LS-91	No Lift Station	NA	NA	NA	NA
LS-94	No Lift Station	NA	NA	NA	NA
LS-95	No Lift Station	NA	NA	NA	NA
LS-96	No Lift Station	NA	NA	NA	NA
LS-97	No Lift Station	NA	NA	NA	NA
LS-98	No Lift Station	NA	NA	NA	NA
LS-99	No Lift Station	NA	NA	NA	NA
LS-100	No Lift Station	NA	NA	NA	NA
LS-103	No Lift Station	NA	NA	NA	NA
LS-109	No Lift Station	NA	NA	NA	NA
LS-110	No Lift Station	NA	NA	NA	NA
LS-117	No Data Available	NA	NA	NA	NA

Appendix E

CAPITAL IMPROVEMENT PROGRAM DETAIL

PROJECT # 049467A
URH001

PROJECT NAME	Sewer System Rehabilitation	Project Manager	Griffith/Gardiner
DEPARTMENT	Public Utilities	Original Plan Date	March 2015
LOCATION	Various Locations	Concurrency Requirement	Sewer
Goal / Objective: Goal 1 Objectives 1, 2 & 4			

DESCRIPTION/JUSTIFICATION:

In accordance with the 2015 Wade Trim I & I Study, sewer system rehabilitation is required in these areas during this fiscal year. The planned scope of work will include the following:

- 1.) Sewer System Inspection
- 2.) Pipe, manholes, and wetwell cleaning
- 3.) Sewer pipe lining and pipeline replacement as required
- 4.) Manhole / wetwell rehabilitation and/or replacement
- 5.) Sewer lateral repair, lateral relining and/or replacement
- 6.) Sewer clean-out repair / replacement

PROJECT	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Sanitary Sewer Collection System:	\$ -	\$ 2,000,000	\$ -	\$ -	\$ -	\$ -	\$ 2,000,000
#101 Sea Bird Island							-
#70 Intracoastal Villas							-
#7 Family Worship Center							-
#41 Lamplighter							-
#5 Charles Street							-
#102 Coral Way							-
TOTALS:	\$ -	\$ 2,000,000	\$ -	\$ -	\$ -	\$ -	\$ 2,000,000

PROJECT EXPENDITURES/FUNDING SOURCES:

PROJECT COSTS:	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Engineering & Planning	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction		2,000,000	-	-	-	-	2,000,000
Equipment	-	-	-	-	-	-	-
TOTAL PROJECT COSTS	\$ -	\$ 2,000,000	\$ -	\$ -	\$ -	\$ -	\$ 2,000,000
PROPOSED SOURCES OF FUNDS:	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Water & Sewer Op Fund (401/421)	\$ -	\$ 2,000,000	\$ -	\$ -	\$ -	\$ -	\$ 2,000,000
Water Impact Fee Fund (405)	-	-	-	-	-	-	-
Sewer Impact Fee Fund (405)	-	-	-	-	-	-	-
Water & Sewer R&R Fund (403)	-	-	-	-	-	-	-
Future Grant/Bonds	-	-	-	-	-	-	-
TOTAL PROJECT REVENUE	\$ -	\$ 2,000,000	\$ -	\$ -	\$ -	\$ -	\$ 2,000,000

OPERATIONAL IMPACT

Rehabilitation projects will improve overall reliability and reduce the capacity of unwanted water into the sewer plant. Reduced operating expenses are anticipated to occur due to this project. Reduction in pump station electrical costs, sewage treatment, overtime call-outs due to sewer back-ups, emergency call-outs due to pump stations at over capacity due to excess I & I, manhole collapses, and pipe failures.

OPERATIONAL IMPACT	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Additional Revenues							
Charges for Services	-	-	-	-	-	-	-
Other Revenues	-	-	-	-	-	-	-
Less Additional Expenditures							
New Personnel	-	-	-	-	-	-	-
Maintenance and Other Operating	-	-	-	-	-	-	-
Non Operating (Debt Service)	-	-	-	-	-	-	-
Net Annual Impact on Operations	-	-	-	-	-	-	-
FUNDING SOURCES	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Water & Sewer O&M Fund (401)	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-

CAPITAL IMPROVEMENT PROGRAM DETAIL

PROJECT # 049467B
URH001

PROJECT NAME	Sewer System Rehabilitation	Project Manager Griffith/Gardiner
DEPARTMENT	Public Utilities	Original Plan Date March 2015
LOCATION	Various Locations	Concurrency Requirement Sewer

Goal / Objective: Goal 1 Objectives 1, 2 & 4

DESCRIPTION/JUSTIFICATION:

In accordance with the 2015 Wade Trim I & I Study, sewer system rehabilitation is required in these areas during this fiscal year. The planned scope of work will include the following:

- 1.) Sewer System Inspection
- 2.) Pipe, manholes, and wetwell cleaning
- 3.) Sewer pipe lining and pipeline replacement as required
- 4.) Manhole / wetwell rehabilitation and/or replacement
- 5.) Sewer lateral repair, lateral relining and/or replacement
- 6.) Sewer clean-out repair / replacement

PROJECT	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Sanitary Sewer Collection System:	\$ -	\$ -	\$ 2,000,000	\$ -	\$ -	\$ -	\$ 2,000,000
#29 Maplewood							
#23 Cambridge Villas							
#76 Baywood							
#107 Deep Water Landing							-
#106 Ponce Inlet Master							-
#19 Beacon Woods							-
TOTALS:	\$ -	\$ -	\$ 2,000,000	\$ -	\$ -	\$ -	\$ 2,000,000

PROJECT EXPENDITURES/FUNDING SOURCES:

PROJECT COSTS:	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Engineering & Planning	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction			2,000,000				2,000,000
Equipment							
TOTAL PROJECT COSTS	\$ -	\$ -	\$ 2,000,000	\$ -	\$ -	\$ -	\$ 2,000,000
PROPOSED SOURCES OF FUNDS:	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Water & Sewer Op Fund (401/421)	\$ -	\$ -	\$ 2,000,000	\$ -	\$ -	\$ -	\$ 2,000,000
Water Impact Fee Fund (405)							
Sewer Impact Fee Fund (405)							
Water & Sewer R&R Fund (403)							
Future Grant/Bonds							
TOTAL PROJECT REVENUE	\$ -	\$ -	\$ 2,000,000	\$ -	\$ -	\$ -	\$ 2,000,000

OPERATIONAL IMPACT

Rehabilitation projects will improve overall reliability and reduce the capacity of unwanted water into the sewer plant. Reduced operating expenses are anticipated to occur due to this project. Reduction in pump station electrical costs, sewage treatment, overtime call-outs due to sewer back-ups, emergency call-outs due to pump stations at over capacity due to excess I & I, manhole collapses, and pipe failures.

OPERATIONAL IMPACT	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Additional Revenues							
Charges for Services	-	-	-	-	-	-	-
Other Revenues	-	-	-	-	-	-	-
Less Additional Expenditures							
New Personnel	-	-	-	-	-	-	-
Maintenance and Other Operating	-	-	-	-	-	-	-
Non Operating (Debt Service)	-	-	-	-	-	-	-
Net Annual Impact on Operations	-	-	-	-	-	-	-
FUNDING SOURCES	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Water & Sewer O&M Fund (401)	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-

CAPITAL IMPROVEMENT PROGRAM DETAIL

PROJECT # 049467C
URH001

PROJECT NAME Sewer System Rehabilitation
DEPARTMENT Public Utilities
LOCATION Various Locations

Project Manager Griffith/Gardiner
Original Plan Date March 2015
Concurrency Requirement Sewer

Goal / Objective: Goal 1 Objectives 1, 2 & 4

DESCRIPTION/JUSTIFICATION:

In accordance with the 2015 Wade Trim I & I Study, sewer system rehabilitation is required in these areas during this fiscal year. The planned scope of work will include the following:

- 1.) Sewer System Inspection
- 2.) Pipe, manholes, and wetwell cleaning
- 3.) Sewer pipe lining and pipeline replacement as required
- 4.) Manhole / wetwell rehabilitation and/or replacement
- 5.) Sewer lateral repair, lateral relining and/or replacement
- 6.) Sewer clean-out repair / replacement

PROJECT	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Sanitary Sewer Collection System:		\$ -	\$ -	\$ 2,000,000	\$ -	\$ -	\$ 2,000,000
#9 Halifax Estates							
#61 Altimira / Super Car Wash							
#14 Parkwood							
#11 Christlancy							
TOTALS:	\$ -	\$ -	\$ -	\$ 2,000,000	\$ -	\$ -	\$ 2,000,000

PROJECT EXPENDITURES/FUNDING SOURCES:

PROJECT COSTS:	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Engineering & Planning	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction	-	-	-	2,000,000	-	-	2,000,000
Equipment	-	-	-	-	-	-	-
TOTAL PROJECT COSTS	\$ -	\$ -	\$ -	\$ 2,000,000	\$ -	\$ -	\$ 2,000,000
PROPOSED SOURCES OF FUNDS:	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Water & Sewer Op Fund (401/421)	\$ -	\$ -	\$ -	\$ 2,000,000	\$ -	\$ -	\$ 2,000,000
Water Impact Fee Fund (405)	-	-	-	-	-	-	-
Sewer Impact Fee Fund (405)	-	-	-	-	-	-	-
Water & Sewer R&R Fund (403)	-	-	-	-	-	-	-
Future Grant/Bonds	-	-	-	-	-	-	-
TOTAL PROJECT REVENUE	\$ -	\$ -	\$ -	\$ 2,000,000	\$ -	\$ -	\$ 2,000,000

OPERATIONAL IMPACT

Rehabilitation projects will improve overall reliability and reduce the capacity of unwanted water into the sewer plant. Reduced operating expenses are anticipated to occur due to this project. Reduction in pump station electrical costs, sewage treatment, overtime call-outs due to sewer back-ups, emergency call-outs due to pump stations at over capacity due to excess I & I, manhole collapses, and pipe failures.

OPERATIONAL IMPACT	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Additional Revenues							
Charges for Services	-	-	-	-	-	-	-
Other Revenues	-	-	-	-	-	-	-
Less Additional Expenditures							
New Personnel	-	-	-	-	-	-	-
Maintenance and Other Operating	-	-	-	-	-	-	-
Non Operating (Debt Service)	-	-	-	-	-	-	-
Net Annual Impact on Operations	-	-	-	-	-	-	-
FUNDING SOURCES	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Water & Sewer O&M Fund (401)	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-

CAPITAL IMPROVEMENT PROGRAM DETAIL

PROJECT # 049467D
URH001

PROJECT NAME Sewer System Rehabilitation
DEPARTMENT Public Utilities
LOCATION Various Locations

Project Manager Griffith/Gardiner
Original Plan Date March 2015
Concurrency Requirement Sewer

Goal / Objective: Goal 1 Objectives 1, 2 & 4

DESCRIPTION/JUSTIFICATION:

In accordance with the 2015 Wade Trim I & I Study, sewer system rehabilitation is required in these areas during this fiscal year. The planned scope of work will include the following:

- 1.) Sewer System Inspection
- 2.) Pipe, manholes, and wetwell cleaning
- 3.) Sewer pipe lining and pipeline replacement as required
- 4.) Manhole / wetwell rehabilitation and/or replacement
- 5.) Sewer lateral repair, lateral relining and/or replacement
- 6.) Sewer clean-out repair / replacement

PROJECT	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Sanitary Sewer Collection System:					\$ 2,000,000		\$ 2,000,000
#88 Coraci / Plantation #2							
#30 Ravenwood							
#82 Lowes / Gateway							
#8 Cypress Head #2							
TOTALS:	\$ -	\$ -	\$ -	\$ -	\$ 2,000,000	\$ -	\$ -

PROJECT EXPENDITURES/FUNDING SOURCES:

PROJECT COSTS:	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Engineering & Planning	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction	-	-	-	-	2,000,000	-	2,000,000
Equipment	-	-	-	-	-	-	-
TOTAL PROJECT COSTS	\$ -	\$ -	\$ -	\$ -	\$ 2,000,000	\$ -	\$ 2,000,000
PROPOSED SOURCES OF FUNDS:	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Water & Sewer Op Fund (401/421)	\$ -	\$ -	\$ -	\$ -	\$ 2,000,000	\$ -	\$ 2,000,000
Water Impact Fee Fund (405)	-	-	-	-	-	-	-
Sewer Impact Fee Fund (405)	-	-	-	-	-	-	-
Water & Sewer R&R Fund (403)	-	-	-	-	-	-	-
Future Grant/Bonds	-	-	-	-	-	-	-
TOTAL PROJECT REVENUE	\$ -	\$ -	\$ -	\$ -	\$ 2,000,000	\$ -	\$ 2,000,000

OPERATIONAL IMPACT

Rehabilitation projects will improve overall reliability and reduce the capacity of unwanted water into the sewer plant. Reduced operating expenses are anticipated to occur due to this project. Reduction in pump station electrical costs, sewage treatment, overtime call-outs due to sewer back-ups, emergency call-outs due to pump stations at over capacity due to excess I & I, manhole collapses, and pipe failures.

OPERATIONAL IMPACT	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Additional Revenues							
Charges for Services	-	-	-	-	-	-	-
Other Revenues	-	-	-	-	-	-	-
Less Additional Expenditures							
New Personnel	-	-	-	-	-	-	-
Maintenance and Other Operating	-	-	-	-	-	-	-
Non Operating (Debt Service)	-	-	-	-	-	-	-
Net Annual Impact on Operations	-	-	-	-	-	-	-
FUNDING SOURCES	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Water & Sewer O&M Fund (401)	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-

CAPITAL IMPROVEMENT PROGRAM DETAIL

PROJECT # 049467E
URH001

PROJECT NAME	Sewer System Rehabilitation	Project Manager	Griffith/Gardiner
DEPARTMENT	Public Utilities	Original Plan Date	March 2015
LOCATION	Various Locations	Concurrency Requirement	Sewer

Goal / Objective: Goal 1 Objectives 1, 2 & 4

DESCRIPTION/JUSTIFICATION:

In accordance with the 2015 Wade Trim I & I Study, sewer system rehabilitation is required in these areas during this fiscal year. The planned scope of work will include the following:

- 1.) Sewer System Inspection
- 2.) Pipe, manholes, and wetwell cleaning
- 3.) Sewer pipe lining and pipeline replacement as required
- 4.) Manhole / wetwell rehabilitation and/or replacement
- 5.) Sewer lateral repair, lateral relining and/or replacement
- 6.) Sewer clean-out repair / replacement

PROJECT	FY16	FY17	FY18	FY19	FY20	FY21	TOTAL
Sanitary Sewer Collection System:						\$ 2,000,000	\$ 2,000,000
#62 Anglers							\$ -
#39 Nova / Herbert							\$ -
							\$ -
							\$ -
							\$ -
							\$ -
							\$ -
TOTALS:	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,000,000	\$ 2,000,000

PROJECT EXPENDITURES/FUNDING SOURCES:

PROJECT COSTS:	0	0	0	0	0	0	TOTAL
Engineering & Planning							\$ -
Construction		-	-	-	-	2,000,000	2,000,000
Equipment							-
TOTAL PROJECT COSTS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,000,000	\$ 2,000,000
PROPOSED SOURCES OF FUNDS:	0	0	0	0	0	0	TOTAL
Water & Sewer Op Fund (401/421)		\$ -	\$ -	\$ -	\$ -	\$ 2,000,000	\$ 2,000,000
Water Impact Fee Fund (405)	-	-	-	-	-	-	-
Sewer Impact Fee Fund (405)	-	-	-	-	-	-	-
Water & Sewer R&R Fund (403)	-	-	-	-	-	-	-
Future Grant/Bonds	-	-	-	-	-	-	-
TOTAL PROJECT REVENUE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,000,000	\$ 2,000,000

OPERATIONAL IMPACT

Rehabilitation projects will improve overall reliability and reduce the capacity of unwanted water into the sewer plant. Reduced operating expenses are anticipated to occur due to this project. Reduction in pump station electrical costs, sewage treatment, overtime call-outs due to sewer back-ups, emergency call-outs due to pump stations at over capacity due to excess I & I, manhole collapses, and pipe failures.

OPERATIONAL IMPACT	0	0	0	0	0	0	TOTAL
Additional Revenues							
Charges for Services	-	-	-	-	-	-	-
Other Revenues	-	-	-	-	-	-	-
Less Additional Expenditures							
New Personnel	-	-	-	-	-	-	-
Maintenance and Other Operating	-	-	-	-	-	-	-
Non Operating (Debt Service)	-	-	-	-	-	-	-
Net Annual Impact on Operations	-	-	-	-	-	-	-
FUNDING SOURCES	0	0	0	0	0	0	TOTAL
Water & Sewer O&M Fund (401)	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-



Inflow & Infiltration Study Presentation

**Presented by Andrew Neff & Edward Fontanin
Utilities Department / Wade Trim
November 17, 2015**



Purpose / Agenda

- **Purpose:** Describe I&I throughout the system and provide recommendations for improvement
- **Agenda:**
 - Introduction
 - Plant and Lift Station I&I Analysis
 - Corrective Costs and Repair Recommendations
 - Benefits of Corrective Action

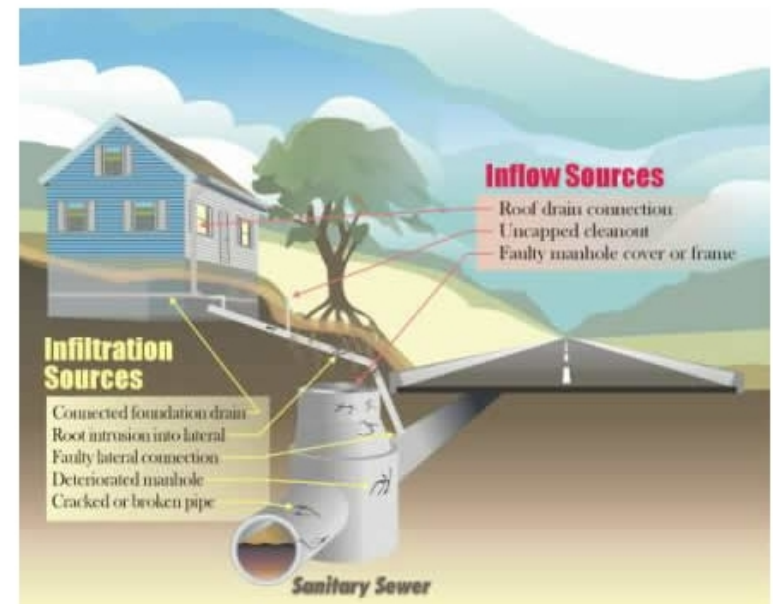


Introduction

What is Inflow & Infiltration?

Scope of Study

- Determine magnitude of I&I at the reclaimed water plant and lift stations
- Provide recommendations for the implementation of yearly I&I rehabilitation and replacement projects
- Describe benefits of eliminating I&I





Treatment Plant Analysis

- Reviewed records from May 2014 to March 2015
- Determined baseline flow to RWP
- Plant flow vs. customer account analysis
 - 1,810,000 MGD of excess water

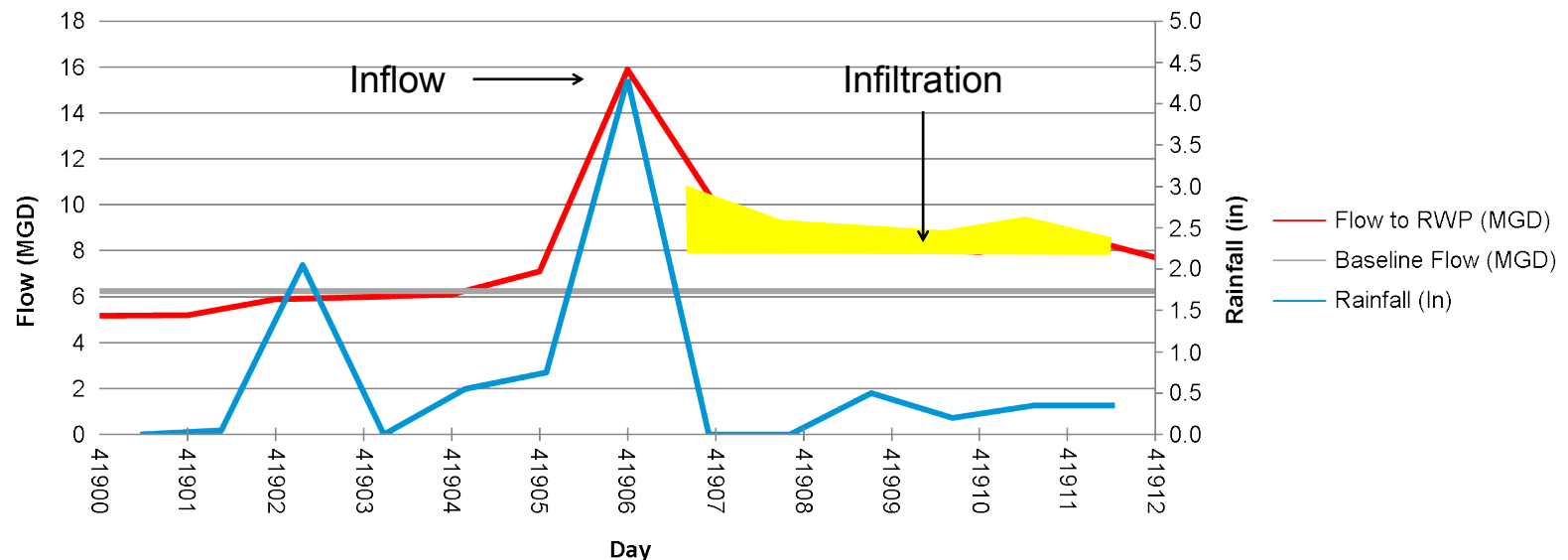


R. Dwayne Huffman Reclaimed Water Plant



RWP September 2014 Rain Even Analysis

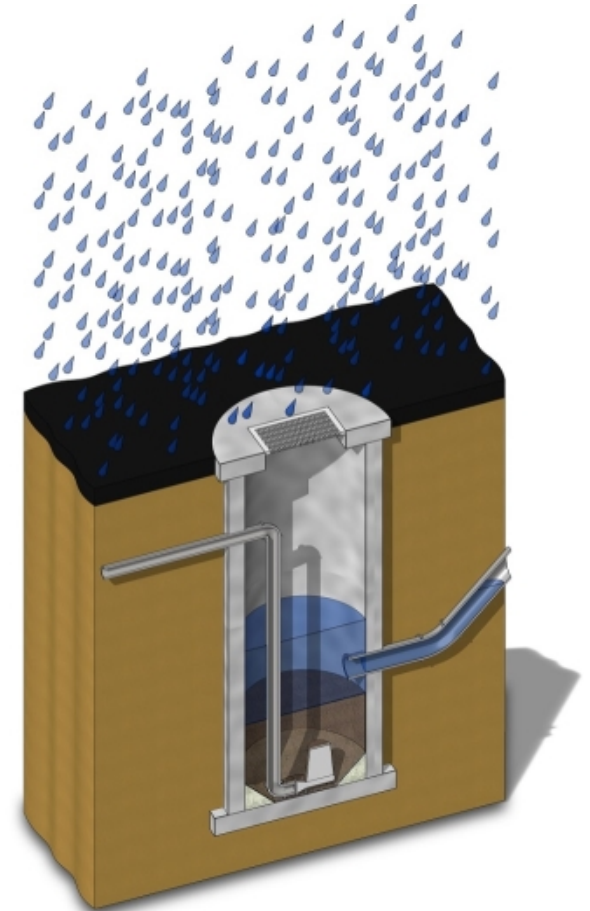
- On September 20th, a moderate rain event triggered a gradual increase in flow to the reclaimed water plant (RWP)
- On September 24th, a larger rain event triggered a large increase flow to the RWP
 - The flow to the plant was **15.886 MGD**, which is more than 2.5 times the average flow





Lift Station Analysis

- Review of 105 lift stations
- Separated rain events and dry weather days
- Infiltration due to groundwater
✓282,000 GPD
- I&I due to stormwater
✓567,000 GPD
- Total I&I determined in lift station analysis
✓ 849,000 GPD
 - Private lift stations were not included



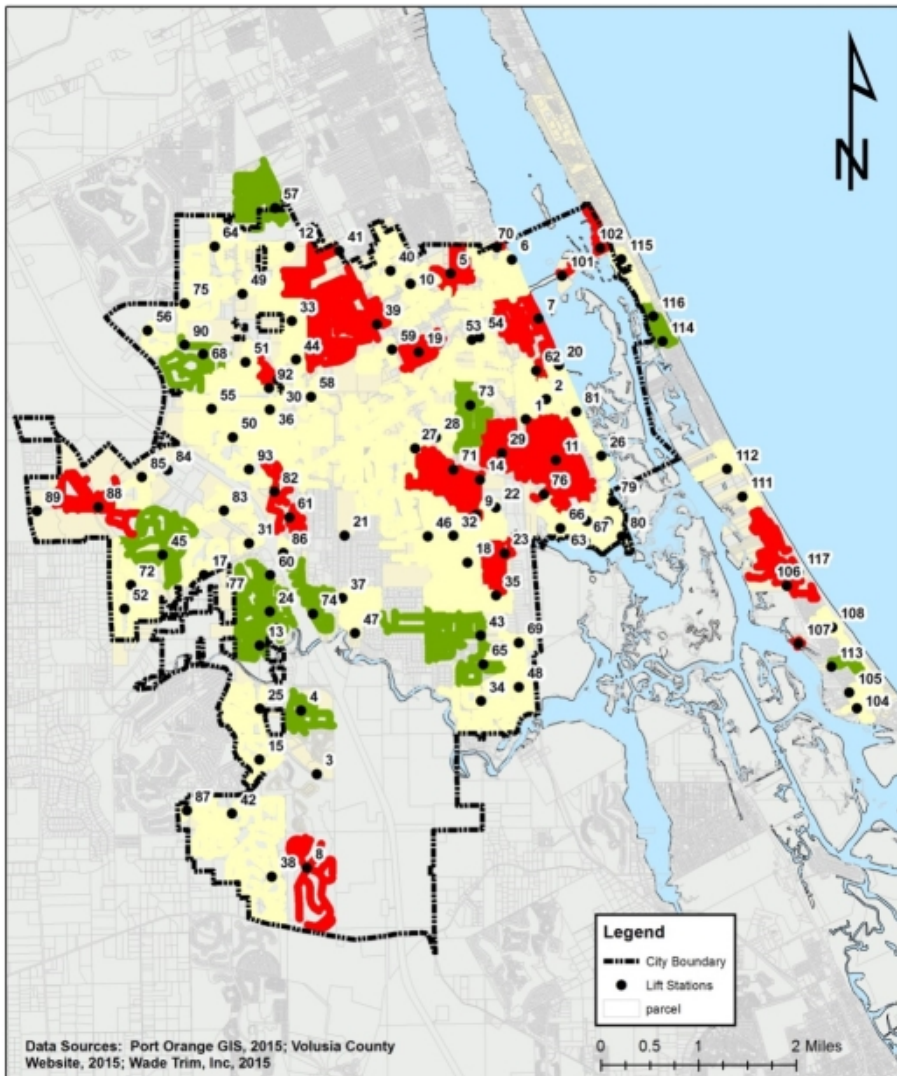
Rainwater in Wet Well / Manhole



Repair Cost Per Gallon I&I



- **Red Areas**
 - Programmed in 5-Year CIP
- **Yellow Areas**
 - Future (> 5 Year) CIP Targets
- **Green Areas**
 - Long-term CIP Areas
 - Currently the least cost efficient





Factors Considered: Cost Per Gallon of I&I

Factors Considered:

- Size of tributary area
- Total estimated I&I
- Previously lined gravity sewer
- Total # manholes, laterals, and cleanouts

Costs Considered:

- Gravity sewer inspection and lining
- Manhole inspection and repair
- Installation of manhole inserts
- Cleanout and lateral inspection and repair

Costs assume 100% inspection and 25% repair per tributary area



Proposed I&I Program

FY 17

LS 101
(Sea Bird Island)

LS 70
(Intracoastal Villas)

LS 7
(F.W. Center)

LS 41
(Lamplighter)

LS 5
(Charles St)

LS 102
(Coral Way)

FY 18

LS 29
(Maplewood)

LS 23
(Cambridge Villas)

LS 76
(Baywood)

LS 107
(D.W. Landing)

LS 106
(P.I. Master)

LS 19
(Beacon Woods)

FY 19

LS 9
(Halifax Estates)

LS 61
(Altimira)

LS 14
(Parkwood)

LS 11
(Christiancy)

FY 20

LS 88
(Coraci / Plant. 2)

LS 30
(Ravenwood)

LS 82
(Lowes/Gateway)

LS 8
(Cypress Head #2)

FY 21

LS 62
(Anglers)

LS 39
(Nova/Hebrt)

- ✓ Priority is based from Wade Trim report and Utilities Staff recommendations
- ✓ \$2M / year budgeted for I&I inspection and repairs. Will adjust as necessary.



Benefits of I&I Program

Direct Benefits:

- System capacity
 - ✓ 1.2 MGD gained over 5 years (\$10M invested vs \$16M to build)
 - ✓ Collection system capacity gained and eliminate sanitary sewer overflows
- Energy savings
 - ✓ Estimate \$70,000 savings at the RWP and Lift Stations over 5 years
- Maintenance reallocation
 - ✓ Directing effort to known I&I
 - ✓ Avoidance of reactive response

Indirect Benefits:

- Environmental protection
- Proactive in preventive maintenance (i.e. sinkholes)



CITY COUNCIL AGENDA ITEM

REQUESTED COUNCIL MEETING DATE 11/17/2015

Consent item: No

SUBJECT: Water Audit/Status of Meter replacement Program

DEPARTMENT: Public Utilities

GOAL:

OBJECTIVE:

RECOMMENDED MOTION:

SUMMARY: This discussion includes an update on the status of the meter replacement program and metered water use compared against water produced.(the water audit). The purpose of the meter replacement program is to ensure billing accuracy, improve accountability of water use, better understand the extent of unaccounted for water in the system and create an increased awareness of water use for the customer improving conservation.

Burton & Associates issues a report, dated August 26, 2015 which included their observations of changes in water consumption patterns based on price, weather and other factors including increased emphasis on water conservation. The report is attached and the metering discussion begins on page 13 in Section 3.3.

Older Sensus meters are being replaced with new Neptune meters under the meter replacement program. Last fiscal year over 5900 Sensus meters were replaced compared to the annual target of 4500.. There are approximately 14,749 Sensus meters remaining to be replaced.

The water audit results reflect unaccounted for water use fluctuating between approximately 7-11.5%. The target is 10%. More emphasis is being placed on data needed for accounted uses of water in the system including hydrant flows, leaks and any firefighting activities. The large meters at the Water Treatment Plant have been replaced which will improve accuracy of plant flows.

Finance is working with Mr. Neff to further explain how the financial picture relates to the Water audit provided.

Project	Funding Account
No.:	No.:

ATTACHMENTS:

1.	Burton & Associates Report	Port Orange FY 2015 Financial Condition Assessment Final Report_ 8.26.15.pdf
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2.	Water Audit updated	Water Audit (Rev).pdf
3.	Water Audit Presentation Updated	Water Audit 11-17-15 updated.pdf
4.	Water Audit (Nov 14- Oct 15)	Water Audit (Nov 14-Oct-15).pdf
5.	Presentation	Water Audit.pptx

Fenwick, Robin
Wilson, Rick
Neff, Andrew
Johansson, M. Jake

Created/Initiated - 10/21/2015
Approved - 10/21/2015
Approved - 11/12/2015
Final Approval - 11/12/2015



City of Port Orange, FL

FY 2015 Utility Financial Condition Assessment

Final Report

August 26, 2015

Prepared by:

BURTON & ASSOCIATES

UTILITY RATES ■ ASSESSMENTS ■ FINANCIAL PLANNING



BURTON & ASSOCIATES

August 26, 2015

Mr. Andy Neff
Utilities Director
City of Port Orange
1000 City Center Cir
Port Orange, FL 32129

Re: FY 2015 Utility Financial Condition Assessment

Dear Mr. Neff:

Burton & Associates is pleased to present this Final Report of the FY 2015 Utility Financial Condition Assessment that we have performed for the City's Water and Sewer Enterprise Fund.

We appreciate the fine assistance provided by you and all of the members of City staff who participated in the analysis. If you or others at the City have any questions, please do not hesitate to call me at (813) 443-5138.

We sincerely appreciate the opportunity to be of service to you and the City, and look forward to the possibility of doing so again in the near future.

Very Truly Yours,



Andrew J. Burnham
Senior Vice President

Enclosure

BURTON & ASSOCIATES

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E-mail: aburnham@burtonandassociates.com

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

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SECTION 1. INTRODUCTION

The City of Port Orange (City) retained the services of Burton & Associates to assess the financial condition of its Water and Sewer Utility System (Utility). This report describes in detail the approach taken to complete the assessment, as well as the results of the analysis, our concluding observations, and future considerations.

1.1 BACKGROUND

In 2013, the City hired a consulting firm to review and update as appropriate the Utility's water and sewer rate structure. The updates ultimately approved by City Council were substantial, resulting in a much more conservation-oriented rate structure than previously in place. The most significant updates included the elimination of smaller residential usage tiers and the establishment of a uniform usage rate for commercial users. The rate structure adjustments became effective on April 1, 2015.

In consideration of the above and other factors, the City retained the services of Burton & Associates to conduct a comprehensive Utility Financial Condition Assessment (UCA) to review bond coverage ratios, CIP spending and future borrowing needs, projected revenues versus expenditures, reserve levels, and alternative multi-year plans of rate adjustments (as may be required). The following sections of this Report describe in detail each of the tasks completed on behalf of the City.

1.2 PROJECT SCOPE & OBJECTIVES

As the name implies, the primary objective of the UCA was to assess the financial condition of the Utility. To achieve this objective, it was required that we populate a multi-year financial forecasting model that could replicate the financial dynamics of the Utility, project future revenue and expenditure requirements, and allow for the evaluation of alternative financial management planning scenarios and sensitivities. Furthermore, and in accordance with the primary objective of the UCA, City staff

requested we provide a comparison of the City's historical rate adjustments to national trends, provide a comparison of the City's "typical" monthly water and sewer bill to that of other local utilities, and identify observations and key issues for future consideration.

It is important to note that no rate adjustments are being proposed at this time. However, future updates will incorporate the results of a CIP master plan, as well as other potential changes that will affect the size and timing of future rate adjustment requirements.

1.3 PROJECT APPROACH

Utilizing historical and budgeted source data, as well as City staff input, we populated a financial forecasting model to perform a revenue sufficiency analysis (RSA) in order to evaluate the adequacy of the revenue provided by the Utility's current rates to meet its current and projected cost requirements. We conducted the RSA to determine whether the Utility's water, sewer, and reclaimed water rates are generating the level of revenues necessary to fund its identified operating and capital needs, including debt service coverage and operating reserve requirements, over a multi-year projection period and, if necessary, to determine the rate revenue adjustments required to satisfy all Utility requirements. Then, working with City staff, we reviewed multiple alternative scenarios, performed sensitivity analyses with instant feedback, and identified key issues and observations.

Among the key issues to be evaluated, City staff requested we evaluate the impacts associated with the Utility's ongoing meter replacement program, as well as perform a cost of service analysis (COSA) to determine the current level of cost recovery provided by the Utility's current reclaimed water rates. With regard to the meter replacement program, City staff requested that we evaluate the change in billed usage for accounts whose meters were recently replaced. Regarding the COSA, City staff ultimately desired to know the level of cost recovery achieved by its current reclaimed water rates and how that compares to other communities.

SECTION 2. REVENUE SUFFICIENCY ANALYSIS

The objective of the Revenue Sufficiency Analysis (RSA) was to evaluate the adequacy of the Utility's water, sewer, and reclaimed water revenues over a multi-year projection period (FY 2016 – FY 2025).¹ Specifically, we determined the level of rate revenue adjustment necessary to fund the Utility's identified operating and capital needs, including debt service coverage and operating reserve requirements. The following sub-sections present a description of the source data, key assumptions, and results of the RSA; whereas, Appendix A presents the supporting financial schedules for the financial management plan described herein.

2.1 DESCRIPTION

The RSA incorporates both historical and projected information. Utility staff provided the detailed historical financial information used to establish the beginning FY 2015 balances for each of the various funds. Any funds reserved or encumbered for specific capital projects were included in the beginning fund balances available for capital projects in FY 2015, while the associated capital project costs were included in the CIP in FY 2015.

The revenue utilized in the RSA consists of rate revenue, interest earnings, development fees, and other minor revenue from miscellaneous service charges. FY 2015 rate revenues were based upon year-to-date actual revenues², extrapolated based upon historical collections³ and the calculated impacts from the recent rate changes⁴. Each

¹ The RSA begins with FY 2015 data; however, the majority of this information serves as base data upon which we derived future year projections of revenues and expenses. As such, for the purposes of the RSA, we do not consider FY 2015 to be part of the projection period.

² City staff provided the year-to-date revenues through May 2015.

³ City staff provided the historical billed usage data, by month, for FY 2012 – FY 2014.

⁴ Water and sewer rate restructuring was effective April 1, 2015.

year thereafter, rate revenues were adjusted to account for assumed customer growth, changes in demands, and annual rate adjustments. Interest earnings were calculated annually based upon average fund balances and assumed annual interest earnings rates. Development fee revenues for FY 2015 were extrapolated based on 9 months of FY 2015 actual results. Beginning in FY 2016, development fee revenues were calculated based upon current the development fees and assumed growth in customers. Except as noted in Section 2.2, all other non-rate revenues were based upon year-to-date actual revenues extrapolated based upon historical collections as provided by City staff.

The FY 2015 and FY 2016 revenue requirements were based upon the FY 2015 Budget and the FY 2016 Preliminary Budget, respectively, and include all operating and maintenance (O&M) expenses (including personal services), debt service requirements, transfers out, and minor capital outlay requirements. Each year thereafter, O&M expenses and minor capital outlays were projected based upon the FY 2016 Preliminary Budget, adjusted by the assumed cost escalation for individual expense categories and annual spending assumptions. The cost escalation factors and spending assumptions are reflected in detail in Appendix A of this Report. In each year of the RSA, existing debt service requirements were based upon the specific amortization schedules provided for each outstanding issuance, but new debt service requirements were calculated within the RSA based upon projected capital funding proceed requirements and assumed borrowing terms and costs.

City staff provided the project specific CIP by year through FY 2021. Each year thereafter, capital requirements were projected based upon the five-year rolling average for the immediately preceding five-year period. The full CIP schedule is presented in project-level detail by year in Appendix A of this Report.

2.2 ASSUMPTIONS

This sub-section describes the key assumptions and policies utilized in the RSA:

2.2.1 Customer Growth

New connection and demand/sales growth projections were based upon a detailed review of historical account data and discussions with City staff regarding the anticipated number of active accounts expected to receive utility service. In each year of the projection period, it is assumed that the Utility will add 200 water and sewer accounts, equating to an average annual growth rate of 0.69% for water service and 0.78% for sewer service. It is assumed that 100% of the projected growth in accounts will be from new construction paying development fees in each year of the projection period.

Furthermore, based upon our review of historical account data, input from City staff, and reflective of nationwide trends, the average usage per account is expected to decline in each year of the projection period. These assumed reductions in per-customer usage offset increases in volume from the projected growth in accounts, resulting in average annual reductions in billed retail demand of 0.22% for water service and 0.03% for sewer service throughout the projection period.

2.2.2 Revenue Impact from Rate Structure Changes

When rates increase, discretionary water consumption (and therefore sewer sales, to a certain degree) is likely to decline. To account for the recent restructuring of the Utility's water and sewer rates, and given the process by which FY 2015 water and sewer rate revenues were estimated, we completed a detailed review of the demand impacts upon each usage tier and customer class (i.e. residential, multifamily, commercial, and separate irrigation meters). Based upon our experience with other communities in Florida, and the change in price resulting from the recent rate changes, we applied a demand factor to the billed usage for each customer class (by tier as appropriate) for the remaining months of FY 2015 to represent the price elasticity that the City should anticipate. Moreover, we also performed similar normalizing adjustments to the projected FY 2016 revenue presented herein to account for the annualized impacts of the new rate structure.

2.2.3 Interest Earnings

The estimated interest earnings rate on invested funds is 0.50% in FY 2015; increasing to 0.75% in FY 2016, 1.00% in FY 2017, 1.25% in FY 2018, 1.50% in FY 2019, 1.75% in FY 2020, and 2.00% in FY 2021, as well as in each year of the projection period thereafter.

2.2.4 Cost Escalation

Annual cost escalation factors for the various types of operating and maintenance expenses were discussed with City staff and applied in each year of the projection period, beginning in FY 2017. The specific escalation factors assumed for each category of expense are presented in Appendix A of this Report and reflect recent historical trends, current industry observations, and Utility management's expectations.

2.2.5 Capital Projects Funding

City staff provided the CIP in current day dollars. Therefore, beginning in FY 2017, a compounded annual cost inflation factor of 3.00% (based upon the five-year average increase in the Engineering News Record Construction Cost Index) was applied to each dollar of projected capital spending to account for inflation in the future cost of construction. Beginning in FY 2022, capital requirements were based upon the five-year rolling average for the immediately preceding five-year period. Through FY 2025, the total budgeted CIP is approximately \$90.4 million. A detailed list of the specific projects and costs by year are presented in Appendix A of this Report.

It is important to note that a dedicated minimum level of revenues set aside for capital funding, reflected as a transfer to the Renewal & Replacement (R&R) Fund and equal to 10% of total prior year operating revenues, was assumed in each year of the projection period. The remaining CIP in each year is assumed to be funded with available development fees and/or additional debt as may be required.

2.2.6 Borrowing Assumptions

To the extent new debt is required during any year of the projection period, it is assumed to carry the following terms:

Long-Term Debt:

- Term: 25 Years
- Interest Rate: 3.50% in FY 2015, increasing by 0.25% each year thereafter until FY 2021 when the cost of borrowing is assumed to be 5.00% in each remaining year of the projection period
- Cost of Issuance: 2.00% of Par
- Debt Service Reserve: Equal to 1 year of annual debt service expense

2.2.7 Debt Service and Coverage

The Utility must maintain net revenue (gross revenue minus operating expenses) that is at least 1.25 times greater than the annual debt service requirement (i.e. the annual principal and interest payments) on its outstanding senior-lien debt.

This coverage requirement is a minimum requirement. To the extent the Utility is unable to meet this requirement it could be found in technical default, resulting in the Utility having its credit rating downgraded, which would affect the interest rate and terms of future financing initiatives. As a policy decision, utilities often measure revenue sufficiency and set rates based upon a higher coverage level to ensure compliance with these covenants in the event future projections of revenues and expenses do not occur as predicted. This RSA targeted debt service coverage of at least 1.50 times net revenue throughout the projection period, which is consistent with the *Midrange* financial profile identified in recently published guidance from the municipal ratings agency Fitch Ratings (July 2013). However, the financial management plan presented herein results in projected debt service coverage greater than 2.00 times net revenues in each year of the forecast, consistent with the *Stronger* financial profile identified in the same publication.

2.2.8 Minimum Working Capital Reserve

Utilities typically establish a target reserve balance for unrestricted reserves in order to provide the ability to withstand cash-flow fluctuations. There can be a significant length of time between when a system provides a service and when a customer may pay for that

service. In addition to timing, the volume of cash flow for utilities can be substantially affected by weather and seasonal demand patterns.

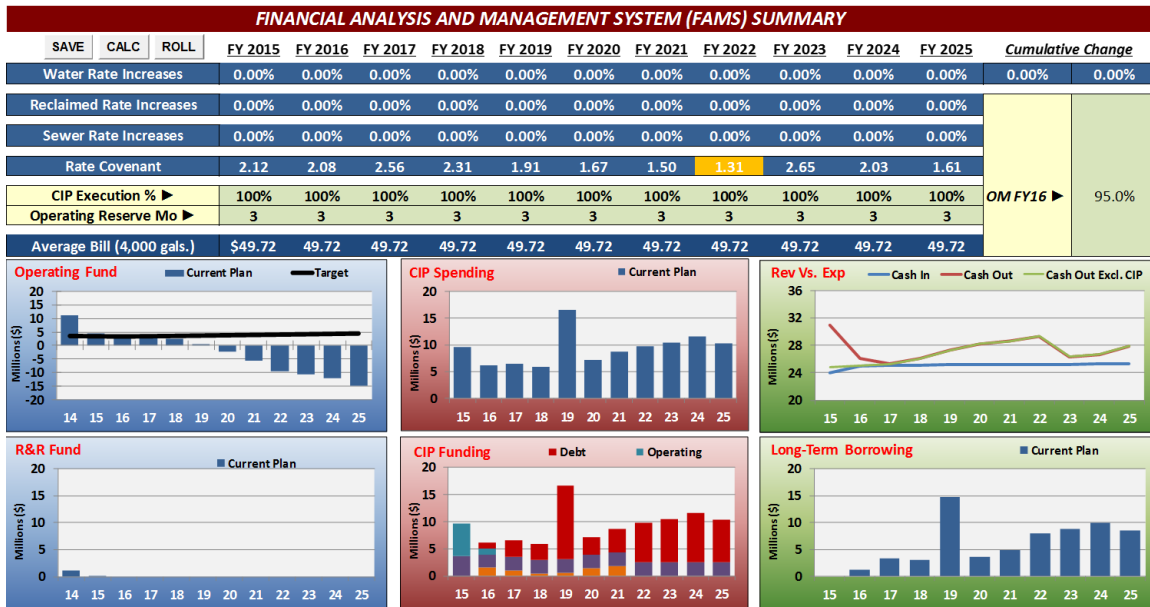
The minimum target balance for unrestricted reserves assumed in this study is equal to 3 months of annual O&M expenses. Absent a detailed multi-year historical study of monthly cash flows and an analysis of the aging of accounts receivable, there are various industry guidelines and practices available to determine an appropriate target reserve. Per a recent analysis conducted by the Rates and Charges Committee of the American Water Works Association (AWWA), a prudent level of minimum unrestricted reserves is an amount equal to at least 2 months of operating and maintenance expenses. This is also consistent with our industry experience, in which water and sewer utilities generally target minimum reserves in the range of 2 to 6 months of O&M expenses.

2.3 RESULTS

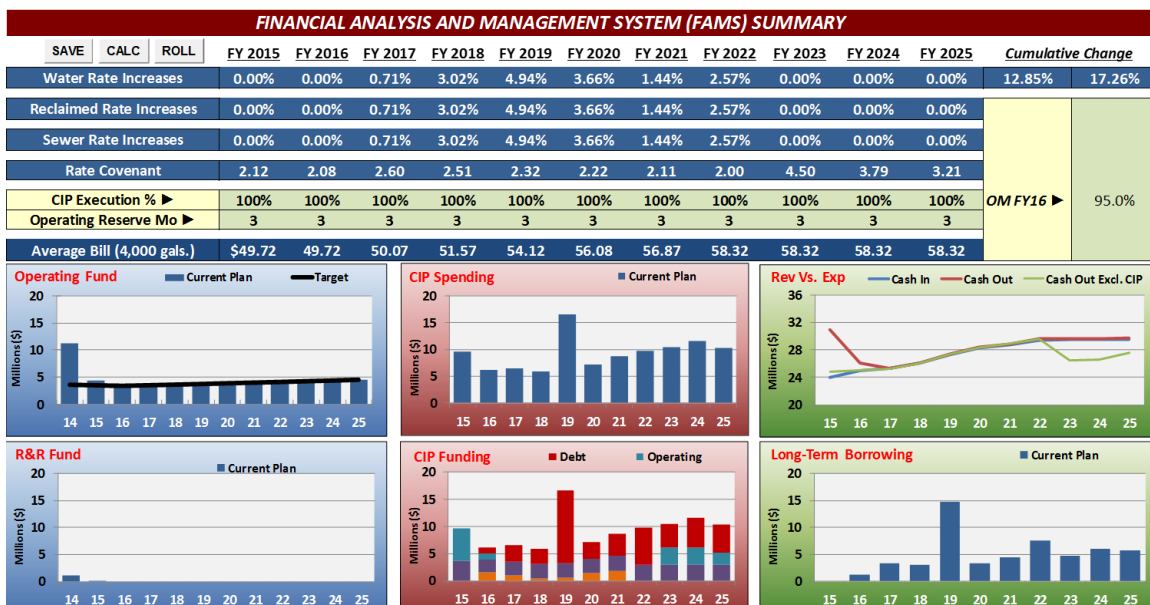
Per the base data, assumptions, and policies detailed in Section 2.1 and Section 2.2, it was determined that annual rate revenues are sufficient to fund all of the financial requirements of the Utility through FY 2017. However, by FY 2019, the status quo results in depletion of the operating fund balance and is therefore unsustainable. The following summary panel reflects the results of this diagnostic scenario as presented to the City Council at its workshop on July 28, 2015:

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

REVENUE SUFFICIENCY ANALYSIS



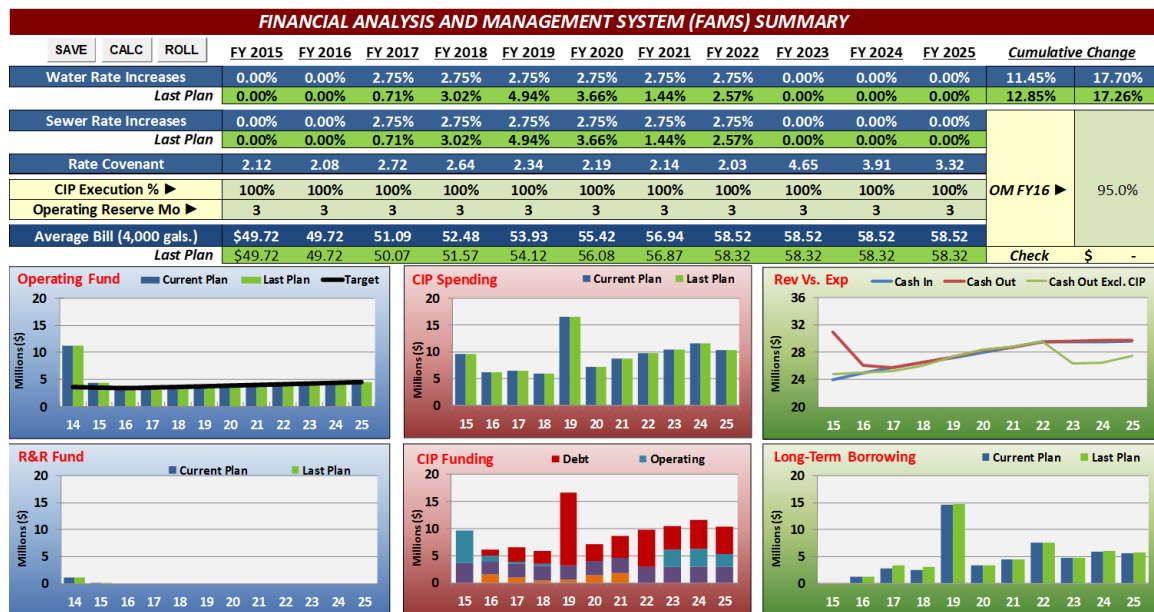
For the Utility to achieve financial sustainability throughout the projection period, annual rate revenue adjustments are needed starting in FY 2017 to 1) fund the Utility's identified annual operating and capital requirements, 2) maintain a minimum working capital reserve balance equal to three months of annual O&M spending, and 3) maintain annual debt service coverage equal to at least 1.50 in each year of the projection period. The following summary panel reflects the results of the "just-in-time" rate scenario as presented to the City Council at its workshop on July 28, 2015:



FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

REVENUE SUFFICIENCY ANALYSIS

Adjusting rate revenues on a “just-in-time” basis, however, results in rate spikes from year to year depending on the specific requirements of each respective year. Therefore, to eliminate these rate spikes and still satisfy all of the Utility’s annual requirements, a “level plan” of annual rate revenue adjustments of 2.75% per year beginning in FY 2017 and continuing through FY 2022 will also achieve financial sustainability through FY 2025. The following summary panel reflects the results of this “level” rate adjustment scenario as presented to the City Council at its workshop on July 28, 2015:



While the financial management plan and supporting schedules presented in Schedule A of this report reflects the “just-in-time” rate adjustment scenario, it is important to note that no rate adjustments are being proposed at this time as a result of this analysis.

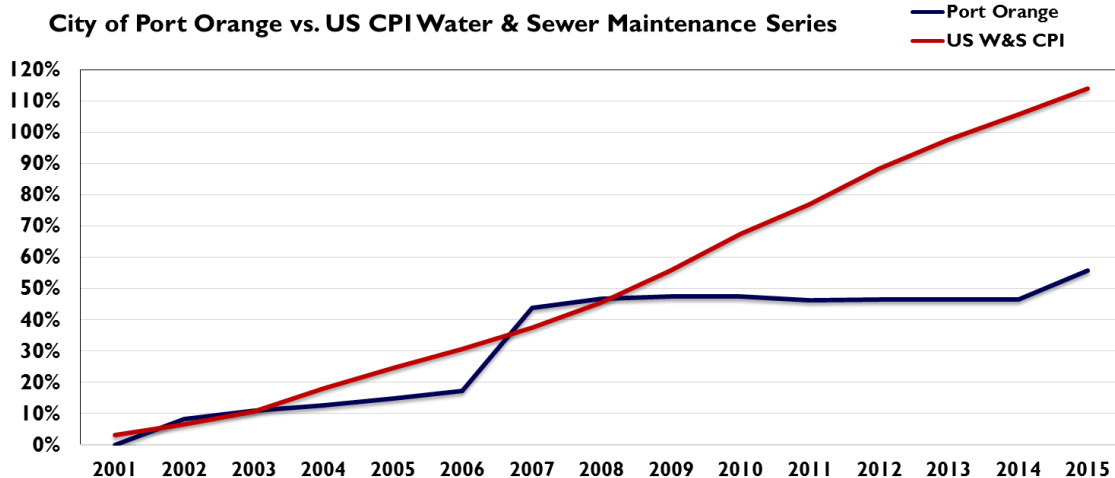
SECTION 3: KEY ISSUES & OBSERVATIONS

As part of the UCA, City staff requested we provide a comparison of the City's historical rate adjustments to national trends, provide a comparison of the City's "typical" monthly water and sewer bill to that of other local utilities, and identify observations and key issues for future consideration. Among the key issues to be evaluated, City staff requested we evaluate the impacts associated with the Utility's meter replacement program, as well as perform a cost of service analysis (COSA) to determine the current level of cost recovery provided by the Utility's current reclaimed water rates. The following sub-sections describe our observations relative to each of these key issues, and Appendix B of this Report presents the supporting financial schedules.

3.1 COMPARISON TO NATIONAL INDUSTRY TRENDS

The projected level of rate adjustments for the Utility are significantly less than the average annual change in the US CPI – Water & Sewerage Maintenance Series of approximately 5% per year. The US CPI – Water & Sewerage Maintenance Series is one of more than 200 item categories that make up the Consumer Price Index (CPI) structure and is of particular relevance to water and sewer utilities as it serves as a measure of the true change in the cost of water and sewer service to urban consumers. Since 2001, the City has implemented cumulative water and sewer rate adjustments of approximately 56% to its typical residential user; whereas, water and sewer rates have increased nationally by 114% during the same time period. The following chart illustrates this comparison as presented to the City Council at its workshop on July 28, 2015:

Comparison to National Industry Trends



- ▶ Measures the national average change in the cost of water and sewer service to households
- ▶ Much more specific and relevant to utilities than overall CPI
- ▶ Average annual increase = 5.3%; Nearly double the rate of increase by City over the same period
- ▶ Note: City increases based upon residential user at 4,000 gallons; 2015 reflects new rate structure

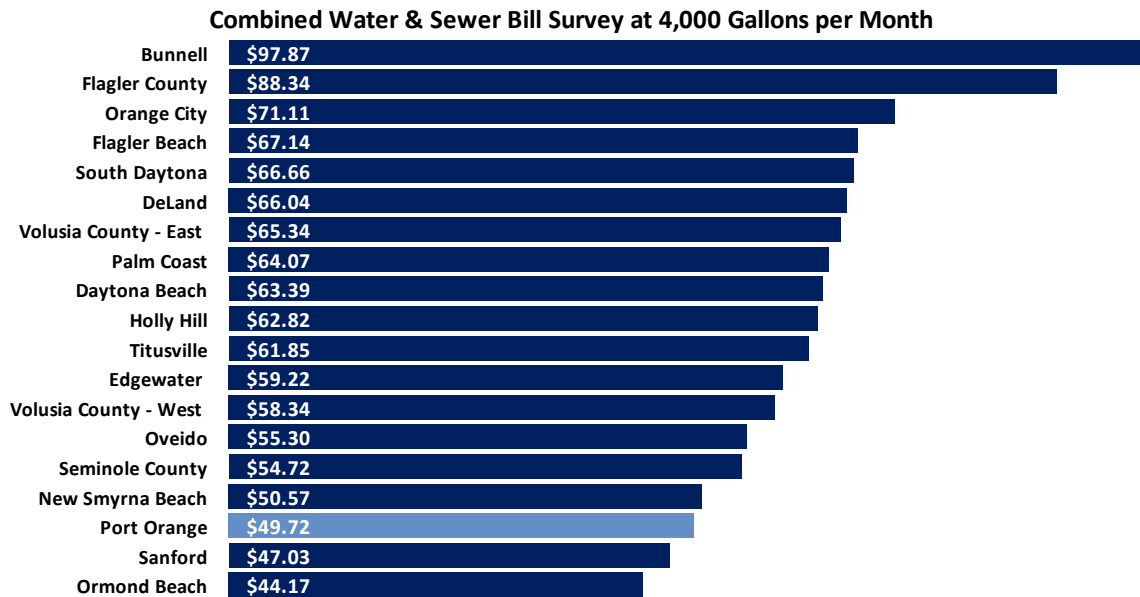
The percentage increases for the City were calculated based upon “typical” residential water use of 4,000 gallons per month, as well as implementation of the new water and sewer rate structure in FY 2015. The divergence between national trends and the rate increases adopted by the City does not necessarily indicate that the City is not keeping up with escalating costs, as there could be many differentiating factors that would allow the City to address its system requirements with lower increases than the national average.

3.2 LOCAL RESIDENTIAL MONTHLY BILL SURVEY

We also surveyed other local utility systems within the City’s surrounding geographic area to determine the combined monthly water and sewer bills charged for “typical” City residential use of 4,000 gallons per month. The following chart represents the results of the monthly bill survey as presented to the City Council at its workshop on July 28, 2015:

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

KEY ISSUES & OBSERVATIONS



The results of the survey indicate that the Utility currently charges a combined water and sewer monthly bill that is among the lowest monthly bills for a typical residential user in the surrounding geographic area. It is important to note that each monthly bill in the survey was calculated based upon the current FY 2015 water and sewer rates, including the City's new water and sewer rate structure effective in April of 2015. It is also important to note that we expect the majority of communities surveyed will implement rate adjustments effective at the beginning of FY 2016.

3.3 EVALUATION OF WATER METER REPLACEMENT IMPACTS

City staff requested that we conduct an evaluation of the change in billed usage for accounts who received new meters as part of a meter replacement program.

Aggressive meter replacement programs are being adopted by an increasing number of water utilities to achieve several key benefits. First, in many cases, is the improvement in the ability to track usage, and to better understand the extent and nature of non-revenue water issues (such as leaks) in the distribution system. A second reason in many communities is the ability of new smart meter systems to send a much more meaningful

conservation message to customers than is possible with their existing metering systems. A third driver may offer some of the most important benefits of all; the ability to create an increased awareness of water use, and of the service provided by the water utility. Some customers will be significantly more mindful of water consumption when provided with accurate water use and an understanding of its true corresponding cost. For some of these customers, this significant improvement in information will translate into an improved perception of the water utility and the level of service it provides.

In the context of the analysis of rates, one of the most important long-term benefits of meter replacement programs will be the enhancement of the utility's ability to achieve further improvements in equitable cost recovery. An improvement in metering accuracy always results from the installation of new meters, and the dramatic improvement in data availability will provide the opportunity for the City to evaluate increasingly precise cost allocations based on actual usage patterns as the customer usage database continues to be expanded and refined. The improvement in metering accuracy and associated increases in billed volume and therefore revenues is another financial benefit that many communities also point to for any type of accelerated meter replacement program.

To analyze the Utility's financial benefit (i.e. increase in billed volume) from the water meter replacements, City staff provided the detailed monthly billing records from FY 2012 – FY 2014 for all accounts. From this database, the following steps were taken to identify and analyze the sub-set of accounts who recently received new meters:

- Step 1: Identify by unique account/location ID the water, sprinkler/irrigation, and reclaimed water accounts that received new meters
- Step 2: Determine which of the accounts identified in Step 1 were issued monthly bills in each of the three months preceding the new meter installation, as well as monthly bills in each of the three months immediately following the new meter installation (thereby excluding instances where a new meter was for a new account, as opposed to a replacement)

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

KEY ISSUES & OBSERVATIONS

- Step 3: Eliminate all accounts where duplicate account/location IDs occurred, as these accounts represented replacement of one newer meter for another
- Step 4: Calculate the average use per account by class for the three-month period preceding the new meter installation, as well as the average use per account by class for the three-month period immediately following the new meter installation
- Step 5: Adjust the observed change in billed water use for other demand drivers, such as seasonality and elasticity, to estimate the change (increase) in demand associated with the improved accuracy of the new meters

Ultimately, we identified 16,799 water meters, 672 sprinkler/irrigation meters, and 4,568 reclaimed water meters that were replaced during the period evaluated. Of these meters, 10,693 water meters, 519 sprinkler/irrigation meters, and 2,414 reclaimed water meters were identified to have been charged monthly bills in each month of the three-month period preceding the new meter installation, as well as monthly bills for each of the months in the three-month period immediately following the new meter installation.

We determined the average billed use for each identified account for each three-month period (preceding and following the new meter installation), and then calculated the difference in consumption after each meter replacement. Finally, the observed changes in consumption were adjusted for the following demand drivers:

- Seasonality – Port Orange does not have a significant number of seasonal residents. However, water demand is greater during summer months, when customers are more likely to engage in activities such as watering lawns, filling pools, and washing cars. As such, a 15% allowance was made to the observed change in water use to account for seasonal variations in water demand.
- Price Elasticity – Increases in monthly bills due to greater accuracy from new meters are likely to result in reduced discretionary water use on the part of some customers. As such, a 10% allowance was made to the observed change

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

KEY ISSUES & OBSERVATIONS

in water user to account for expected elasticity of demand that may extend beyond the short time period analyzed.

- Other – A 5% allowance was made to the observed change in water use to recognize that some of the observed changes in water use were likely a result of other variables, such as changes in occupancy and/or property use, partial month bills, etc.

In summary, the observed changes in water use for the identified accounts were applied to the total number of locations with new water meters to calculate an estimated increase in annualized consumption for all locations having received new meters. The aforementioned adjustments for seasonality, elasticity of demand, and other variables were then deducted from that calculated amount to determine the total estimated increase in billed volume from the meter replacement program.

Once the increase in billed volume from the meter replacement program was identified, we then subtracted the observed change in total system demand over the same time period to identify the impact of other demand drivers (such as changes in weather, economy, conservation awareness, technology, etc.) to the Utility's total billed usage.

The analysis of the changes in use for water, sprinkler/irrigation, and reclaimed accounts that recently received meter replacements are presented in the following tables⁵:

⁵ It is important to note that additional analysis was performed with City staff after presentation of the initial results to the City Council at its workshop on July 28, 2015 in order to provide greater clarity/detail.

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

KEY ISSUES & OBSERVATIONS

Change in Billed Water Consumption After Water Meter Replacements

# of Water Meters Studied (FY 12 - FY 14)	10,693	
Average Consumption - 3 Months Prior (TGAL / Month)	4.45	
Average Consumption - 3 Months After (TGAL / Month)	5.14	
Observed % Increase in Billed Water	15.5%	
# of Locations with New Water Meters	16,799	
Calculated Increase in Annualized Consumption (TGAL)	138,665	
Adjustments Due to Short Sample Period		
Seasonality	-20,800	
Demand Reductions Due to Elasticity	-13,867	
Allowance for Other Variables	-6,933	% Change in Total Use
Final Estimated Increase in Use From Program (TGAL)	97,066	6.2%
% Gain in Annual Consumption From Accounts Affected	10.8%	
Actual Change in Demands (FY 12-FY 14) (TGAL)	4,847	0.3%
Offsets: Weather, Economy, Conservation, Technology (TGAL)	-92,219	-5.9%

Change in Billed Water Consumption After Sprinkler/Irrigation Water Meter Replacements

# of Water Meters Studied (FY 12 - FY 14)	519	
Average Consumption - 3 Months Prior (TGAL / Month)	4.97	
Average Consumption - 3 Months After (TGAL / Month)	6.28	
Observed % Increase in Billed Water	26.4%	
# of Locations with New Water Meters	672	
Calculated Increase in Annualized Consumption (TGAL)	10,566	
Adjustments Due to Short Sample Period		
Seasonality	-1,585	
Demand Reductions Due to Elasticity	-1,057	
Allowance for Other Variables	-528	% Change in Total Use
Final Estimated Increase in Use From Program (TGAL)	7,396	7.8%
% Gain in Annual Consumption From Accounts Affected	18.5%	
Actual Change in Demands (FY 12-FY 14) (TGAL)	-19,959	-21.0%
Offsets: Weather, Economy, Conservation, Technology (TGAL)	-27,355	-28.8%

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

KEY ISSUES & OBSERVATIONS

Change in Billed Water Consumption After Reclaimed Water Meter Replacements

# of Water Meters Studied (FY 12 - FY 14)	2,414	
Average Consumption - 3 Months Prior (TGAL / Month)	13.84	
Average Consumption - 3 Months After (TGAL / Month)	13.03	
Observed % Increase in Billed Water	-5.8%	
# of Locations with New Water Meters	4,568	
Calculated Increase in Annualized Consumption (TGAL)	-44,363	
Adjustments Due to Short Sample Period		
Seasonality	6,654	
Demand Reductions Due to Elasticity	4,436	
Allowance for Other Variables	2,218	% Change in Total Use
Final Estimated Increase in Use From Program (TGAL)	-31,054	-2.1%
% Gain in Annual Consumption From Accounts Affected	-4.1%	
Actual Change in Demands (FY 12-FY 14) (TGAL)	-208,257	-14.1%
Offsets: Weather, Economy, Conservation, Technology (TGAL)	-177,203	-12.0%

In summary, we believe that the increases in demand from the meter replacement program occurring in FY 2012 through FY 2014 have been offset by reductions in demand associated with other demand drivers, notably changes in weather conditions. As can be seen from the table included herein, there have been considerable increases in rainfall from FY 2012 through FY 2014.

Rainfall Data	
Fiscal Year	Total
2011	41.16
2012	41.68
2013	50.66
2014	58.38

A recent rate analysis that Burton & Associates conducted for the City of Deltona serves as a good basis for comparing the calculated impacts of the City's meter replacement program and the offsetting reductions in total demand from FY 2012 through FY 2014.

The City of Deltona is also in Volusia County, and experiences similar rainfall patterns and economic conditions as the City. The City of Deltona does not have an aggressive water meter replacement program and from FY 2012 – FY 2014 did not implement any significant rate increases. From FY 2012 through FY 2014 the City of Deltona's billed water demand decreased by 7% and their sprinkler/irrigation demand decreased by 23%. Per the analysis presented herein for the City, we estimated an overall demand reduction from changes in other drivers of demand of 6% for water and 29% for sprinkler/irrigation meters. As such, without the meter replacement program, the City's change in total billed water demands would likely have been more comparable to that of the City of Deltona.

It is our opinion that the City's meter replacement program has resulted in increases in water sales volumes in most cases. This is as expected, and reflects one of the generally anticipated benefits of any meter replacement program – to more accurately measure and bill for water consumption. The estimated effects of elasticity and other factors influencing demand on the entire system offset the increases resulting from new meters, but the program has clearly contributed to improved billing accuracy and to increases in billable volumes relative to levels that would have resulted otherwise. Billable volumes for reclaimed water are an exception to the general pattern, but this exception is likely the result of the unique, irrigation-focused demand characteristics of reuse water customers. As such, this exception does not suggest any negative implications for the program, which is improving data and billing accuracy with every new meter installation.

3.4 RECLAIMED WATER COST OF SERVICE ANALYSIS

Additionally, City staff requested we evaluate the Utility's proposed FY 2016 cost requirements to determine the level of cost recovery generated from reclaimed water rates to fund the costs of providing reclaimed water services; as well as provide input regarding the appropriateness of the estimated degree of cost recovery for a system such as that maintained by the City.

The cost of providing reclaimed water service is comprised of three cost components: O&M expenses, new capital requirements (as identified within the capital improvement program, if any), and historical capital investment (net of contributed or grant-funded capital). Utilizing the FY 2016 Proposed Budget, we allocated O&M expenses by service type (water, sewer, and reclaimed water). Allocations were based upon specific criteria, such as projected rate revenue by service type, estimated demands/flows by service type, customer counts by service type, capital investment by service type, staff input, or on an indirect basis (reflecting the overall allocation of O&M expenses by service type). We allocated debt service costs by service type in proportion to the debt funded capital investment in each utility system. The capital improvement program reflected no

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT KEY ISSUES & OBSERVATIONS

additional investment in the reclaimed system for FY 2016. The allocation of proposed FY 2016 cost requirements is presented in Appendix B of this Report.

The historical capital investment requirements associated with the provision of reclaimed water service were based upon the estimated annual amortization of historical capital investment in the reclaimed water system through FY 2015. Based upon input from Utility staff, historical investment in the reclaimed system is approximately \$30 million and is reasonably amortized over a 40-year term (indicative of the overall anticipated useful life of the system assets).

Upon determining the proposed FY 2016 costs allocable to the reclaimed water system, we compared those costs to the projected FY 2016 reclaimed water rate revenue to determine the level of cost recovery achieved by the City's current reclaimed water rates. Summarized in the following table is the calculation of reclaimed water percent cost recovery, as presented to the City Council at its workshop on July 28, 2015:

FY 2016 Cost Allocation Summary

FY 16 Revenue vs Expenses	Revenues	Revenue %	Expenses	Expense %
Water	\$ 11,792,147	45.7%	\$ 10,458,422	40.6%
Sewer	\$ 12,533,972	48.6%	\$ 13,127,734	50.9%
Reclaimed	\$ 1,457,684	5.7%	\$ 2,197,659	8.5%
Total	\$ 25,783,803	100.0%	\$ 25,783,815	100.0%
Historical Investment in Reclaimed System	\$ 30,000,000			
Annual Amortization (40 Year Life)	\$ 750,000			
Full Cost of Reuse System	\$ 2,947,659			
Current Revenue	\$ 1,457,684			
% Cost Recovery	49.5%			

Per the allocation process described, approximately \$2.2 million, or 8.5%, of the Utility's identified FY 2016 cost requirements were deemed allocable to the reclaimed system; whereas, the remaining requirements of approximately \$23.6 million, or 91.5%, of identified FY 2016 cost requirements were allocated to the water and sewer systems. Furthermore, the annual amortization of historical capital investment in the reclaimed

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

KEY ISSUES & OBSERVATIONS

water system is \$750,000. In total, the full identified cost of providing reclaimed water service is approximately \$2.9 million. However, projected FY 2016 reclaimed water rate revenue totals approximately \$1.5 million. Therefore, in total, projected FY 2016 reclaimed water rate revenues recover approximately 50% of the total identified cost of providing reclaimed water service.

Reclaimed water is often provided by utility systems for a regulatory and/or an environmental purpose, and provides benefits to both the water (avoided water supply costs) and sewer (means of effluent disposal) systems of a municipal utility. As such, it is common for reclaimed water rates to recover less than the full cost of service.

The cost of producing reclaimed water is often greater than that for potable water, but reclaimed water rates are often set lower to encourage customers to use the service. It has been our experience working with utilities throughout Florida that growing or expanding reclaimed water systems, such as the cities of Naples, Venice, and Deltona) will typically charge reclaimed water rates that recover anywhere from 10% - 40% of system costs. On the other hand, more mature systems, such as the cities of Clearwater and St. Petersburg, as well as Orange County, will typically charge reclaimed water rates that recover anywhere from 50% - 70% of system costs. The City's reclaimed water rate revenue recovers approximately 50% of the full cost of providing reclaimed water service. This level of cost recovery does not necessarily represent a situation requiring change, however the City may wish to have specific policy discussions to determine whether or not it is desirable to increase rates to more fully recover the costs of this service.

SECTION 4: CONCLUSIONS & FUTURE CONSIDERATIONS

4.1 CONCLUSIONS

Based upon the UCA described herein, we have identified the following conclusions:

- No rate revenue adjustments are needed in FY 2016.
- Annual rate revenue adjustments may be needed starting in FY 2017 to 1) fund the Utility's identified annual operating and capital requirements, 2) maintain a minimum working capital reserve balance equal to approximately three months of annual O&M spending, and 3) maintain annual debt service coverage equal to at least 1.50.
- Annual long-term borrowing is required beginning in FY 2016 to fully fund the Utility's identified capital requirements as currently provided.
- The current level of future rate adjustments requirements identified herein are significantly less than the national average of approximately 5% as reflected in the US CPI – Water & Sewerage Maintenance Series.
- The results of the local residential monthly water and sewer bill survey indicate that the Utility currently charges a combined water and sewer monthly bill that is among the lowest monthly bills for its typical residential user (4,000 gallons per month).
- The City's meter replacement program has clearly provided improvements in accuracy and increases in billable volumes. While the financial benefit of these increases has been offset by usage reductions associated with other identified demand drivers, including rainfall and conservation, the City likely avoided significant reductions in billed revenue due to the increased accuracy of the new meters.
- The revenues from the City's reclaimed water rates only recover approximately 50% of the costs of providing this service.

4.2 FUTURE CONSIDERATIONS

The following have been identified as items for future consideration:

- The City should closely monitor the revenue recovery under the new water and sewer rate structure implemented in April of 2015, which included substantial changes and is much more conservation oriented than the prior rate structure.
- Future financial model updates will need to reflect the integration of capital requirements identified per the development of utility system capital master plans, which will impact the amount and timing of the identified multi-year CIP upon which the financial management plan presented herein was based.
- Any changes to financial management policies (such as reserve levels), indirect cost allocations, new service programs, and regulatory changes may impact the level of rate adjustment requirements identified herein.
- The level of new development and changes in demand should be closely monitored and factored into future updates so that any evolving trends can be identified and included in the financial forecast of the Utility as soon as possible.

Appendix A – Supporting Financial Schedules for the RSA

Schedule 1 contains the assumptions of the RSA

Schedule 2 identifies the end of FY 2014 fund balances that serve as the FY 2015 beginning balances of the analysis

Schedule 3 provides a listing of the ten-year capital improvement program that was utilized in the RSA

Schedule 4 presents a detailed list of all projected cash inflows from FY 2015 – FY 2025

Schedule 5 presents a detailed list of all projected cash outflows from FY 2015 – FY 2025

Schedule 6 presents the list of specific annual cost escalation factors, in line-item detail

Schedule 7 contains the FAMS-XL © Control Panel that presents a summary of the financial management plan, including annual rate increases, debt service coverage ratios, annual O&M execution rates, customer impacts, and fund balances

Schedule 8 presents the projected annual net income, debt service coverage, and cash flow results

Schedule 9 shows the projected funding sources for the capital improvement program

Schedule 10 contains the calculation of projected annual long-term borrowing

Schedule 11 presents a fund-level cash flow reconciliation, providing the beginning balance in each year, the amount utilized for project funding or payment of debt service, interest calculations, and the end of year fund balance

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT
APPENDIX A

Schedule 1 – Assumptions

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
<u>Annual Revenue Growth - Water:</u>											
Number of Billed Accounts	28,299	28,499	28,699	28,899	29,099	29,299	29,499	29,699	29,899	30,099	30,299
Growth	N/A	200	200	200	200	200	200	200	200	200	200
<i>Percent Change in Billed Accounts</i>	N/A	0.71%	0.70%	0.70%	0.69%	0.69%	0.68%	0.68%	0.67%	0.67%	0.66%
<i>Percent Change in Billed Use</i>	N/A	0.71%	-0.31%	-0.31%	-0.31%	-0.32%	-0.32%	-0.33%	-0.33%	-0.34%	-0.34%
Projected Growth in Capital Contribution Charge Paying Accounts	N/A	200	200	200	200	200	200	200	200	200	200
<u>Annual Revenue Growth - Reclaimed:</u>											
Number of Billed Accounts	24,990	24,990	24,990	24,990	24,990	24,990	24,990	24,990	24,990	24,990	24,990
Growth	N/A	0	0	0	0	0	0	0	0	0	0
<i>Percent Change in Billed Accounts</i>	N/A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<i>Percent Change in Billed Use</i>	N/A	0.00%	-1.00%	-1.00%	-1.00%	-1.00%	-1.00%	-1.00%	-1.00%	-1.00%	-1.00%
<u>Annual Revenue Growth - Sewer:</u>											
Number of Billed Accounts	7,411	7,611	7,811	8,011	8,211	8,411	8,611	8,811	9,011	9,211	9,411
Growth	N/A	200	200	200	200	200	200	200	200	200	200
<i>Percent Change in Billed Accounts</i>	N/A	0.81%	0.80%	0.79%	0.79%	0.78%	0.78%	0.77%	0.76%	0.76%	0.75%
<i>Percent Change in Billed Use</i>	N/A	0.81%	0.80%	-0.21%	-0.22%	-0.23%	-0.23%	-0.24%	-0.24%	-0.25%	-0.26%
Projected Growth in Capital Contribution Charge Paying Accounts	N/A	200	200	200	200	200	200	200	200	200	200
<u>Price Elasticity Coefficient:</u>											
Applied to Usage Charge Rate Revenue	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>Capital Contribution Charges:</u>											
Development Fees											
Water	\$ 1,555	\$ 1,555	\$ 1,555	\$ 1,555	\$ 1,555	\$ 1,555	\$ 1,555	\$ 1,555	\$ 1,555	\$ 1,555	\$ 1,555
Sewer	\$ 1,540	\$ 1,540	\$ 1,540	\$ 1,540	\$ 1,540	\$ 1,540	\$ 1,540	\$ 1,540	\$ 1,540	\$ 1,540	\$ 1,540
<u>Average Annual Interest Earnings Rate:</u>											
On Fund Balances	0.50%	0.75%	1.00%	1.25%	1.50%	1.75%	2.00%	2.00%	2.00%	2.00%	2.00%
<u>Operating Budget Execution Percentage:</u>											
Certification/Licenses	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Operating Expenses	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Capital Spending	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<u>Operating Fund Reserve Target:</u>											
Number of Months of Annual Operating Expense	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

Schedule 2 – Beginning Balances

APPENDIX A

GROUPING OF FUNDS IN MODEL

	Revenue Fund	Capital Projects Fund	Renewal & Replacement	Water Development	Sewer Development	Restricted Reserves
CURRENT UNRESTRICTED ASSETS						
Cash	\$ 10,851,218	-	1,163,604	2,366,464	2,157,349	-
Accounts Receivable, Net	1,681,473	-	-	-	-	-
Due From Other Governments	1,573,893	-	-	-	-	-
Inventories	468,098	-	-	-	-	-
Cash - Fund 402	-	-	-	-	-	3,005,606
Cash/DSR - Fund 402	-	-	-	-	-	715,750
Cash - Fund 416	-	-	-	-	-	1,011,632
Due From Other Funds - Fund 416	-	-	-	-	-	298,544
Investments - Fund 416	-	-	-	-	-	271,913
Cash & Due From Other Funds - Fund 417	-	-	-	-	-	1,744,294
Cash - Fund 418	-	-	-	-	-	489,904
Cash - Fund 420	-	-	-	-	-	1,154,927
Due From Other Funds - Fund 420	-	-	-	-	-	205,930
Cash - Fund 421	936,087	-	-	-	-	-
Receivables - Fund 421	9,026	-	-	-	-	-
Net Due From Other Governments - Fund 421	209,507	-	-	-	-	-
Prepaid Items	18,720	-	-	-	-	-
TOTAL ASSETS	\$ 15,748,022	-	1,163,604	2,366,464	2,157,349	8,898,500
Less: Accounts Payable & Accrued Liabilities	(525,825)	-	-	-	-	(256,742)
Less: Deposits	(3,365,943)	-	-	-	-	-
Less: Unearned Revenue	(64,091)	-	-	-	-	(64,379)
Less: Compensated Absences	(57,886)	-	-	-	-	-
Less: Accrued Interest Payable	-	-	-	-	-	(377,032)
Less: Inventories	(468,098)	-	-	-	-	-
CALCULATED FUND BALANCE (ASSETS - LIABILITIES)	\$ 11,266,179	-	1,163,604	2,366,464	2,157,349	8,200,347
Plus/(Less): Adjustment	-	-	-	-	-	-
NET UNRESTRICTED FUND BALANCE	\$ 11,266,179	-	1,163,604	2,366,464	2,157,349	8,200,347

FUND TITLE	Funds		Beginning
	Balance as of 9/30/2014	Encumbered or Reserved for Projects not in the CIP	Balance Available for Projects in the CIP
Water Development Fees	\$ 2,366,464	-	2,366,464
Sewer Development Fees	\$ 2,157,349	-	2,157,349
Restricted Reserves	\$ 8,200,347	-	8,200,347
Capital Projects Fund	\$ -	-	-
Renewal & Replacement	\$ 1,163,604	-	1,163,604
Revenue Fund	\$ 11,266,179	-	11,266,179
Total Consolidated Fund Balance	\$ 25,153,944	-	25,153,944

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 3 – Capital Improvement Plan

PROJECT DESCRIPTION	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Water Supply Wells	\$ -	50,000	51,500	53,050	54,650	56,300	57,950	-	-	-	-
Water Reuse Program	-	-	-	159,150	3,279,000	-	-	-	-	-	-
Water System Replacements A	-	900,000	1,545,000	-	-	-	-	-	-	-	-
Water System Replacements B	-	-	-	636,600	-	-	-	-	-	-	-
Water System Replacements C	-	-	-	-	765,100	-	-	-	-	-	-
Water System Replacements D	-	-	-	-	-	900,800	927,200	-	-	-	-
Water System Replacements E	-	-	-	-	-	-	463,600	-	-	-	-
Water System Extensions/Upsizing A	-	50,000	51,500	53,050	54,650	56,300	57,950	-	-	-	-
Water System Extensions/Upsizing B	-	-	-	-	-	281,500	-	-	-	-	-
Water System Extensions/Upsizing C	-	-	-	-	-	450,400	-	-	-	-	-
City Cost Participation Project	-	50,000	103,000	106,100	109,300	112,600	115,900	-	-	-	-
Telemetry Instrument/Control System	-	180,000	206,000	190,980	196,740	225,200	173,850	-	-	-	-
Utilities Mapping	-	100,000	103,000	106,100	109,300	112,600	115,900	-	-	-	-
Reclaimed Water Plant Renovations/Replacements A	-	200,000	309,000	-	32,790	-	162,260	-	-	-	-
Reclaimed Water Plant Renovations/Replacements B	-	90,000	82,400	-	-	337,800	-	-	-	-	-
Reclaimed Water Plant Renovations/Replacements C	-	30,000	-	-	109,300	-	-	-	-	-	-
Reclaimed Water Plant Renovations/Replacements D	-	-	82,400	-	-	-	-	-	-	-	-
Reclaimed Water Plant Renovations/Replacements E	-	-	139,050	-	-	-	104,310	-	-	-	-
Reclaimed Water Plant Renovations/Replacements F	-	-	61,800	-	-	-	-	-	-	-	-
Reclaimed Water Plant Renovations/Replacements G	-	-	-	84,880	-	-	-	-	-	-	-
Reclaimed Water Plant Renovations/Replacements H	-	-	-	265,250	-	-	-	-	-	-	-
Reclaimed Water Plant Renovations/Replacements I	-	-	-	95,490	295,110	-	-	-	-	-	-
Reclaimed Water Plant Renovations/Replacements J	-	-	-	-	7,104,500	-	-	-	-	-	-
Reclaimed Water Plant Renovations/Replacements K	-	-	-	-	98,370	-	-	-	-	-	-
Reclaimed Water Plant Renovations/Replacements L	-	-	-	-	-	67,560	-	-	-	-	-
Reclaimed Water Plant Renovations/Replacements M	-	-	-	-	-	180,160	-	-	-	-	-
Reclaimed Water Plant Renovations/Replacements N	-	-	-	-	-	-	278,160	-	-	-	-
Reclaimed Water Plant Renovations/Replacements O	-	-	-	-	-	-	104,310	-	-	-	-
Potable Water Plant Renovations/Replacements A	-	250,000	-	-	-	-	-	-	-	-	-
Potable Water Plant Renovations/Replacements B	-	-	77,250	79,575	54,650	67,560	144,875	-	-	-	-
Potable Water Plant Renovations/Replacements C	-	-	154,500	-	-	-	-	-	-	-	-
Potable Water Plant Renovations/Replacements D	-	125,000	103,000	79,575	191,275	140,750	144,875	-	-	-	-
Potable Water Plant Renovations/Replacements E	-	75,000	-	-	-	56,300	-	-	-	-	-
Potable Water Plant Renovations/Replacements F	-	-	25,750	-	-	-	-	-	-	-	-
Potable Water Plant Renovations/Replacements G	-	-	-	132,625	136,625	-	-	-	-	-	-
Potable Water Plant Renovations/Replacements H	-	-	-	79,575	-	129,490	-	-	-	-	-
Replace Existing Lift Stations	-	-	370,800	381,960	393,480	405,360	417,240	-	-	-	-
Sewer System Rehabilitation A	-	-	2,060,000	-	-	-	-	-	-	-	-
Sewer System Rehabilitation B	-	-	-	2,122,000	-	-	-	-	-	-	-
Sewer System Rehabilitation C	-	-	-	-	2,186,000	-	-	-	-	-	-
Sewer System Rehabilitation D	-	-	-	-	-	2,252,000	-	-	-	-	-
Sewer System Rehabilitation E	-	-	-	-	-	-	2,318,000	-	-	-	-
Utility Coordination and Relocation	-	25,000	25,750	26,525	27,325	28,150	28,975	-	-	-	-
Meter Replacement Program	-	873,000	899,190	926,253	1,080,977	982,998	1,011,228	-	-	-	-
Taylor Road Improvements	-	-	-	-	-	-	1,854,400	-	-	-	-

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT
APPENDIX A

Schedule 3 – Capital Improvement Plan

<u>PROJECT DESCRIPTION</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
White Acres Central Wastewater Connection	-	500,000	-	-	-	-	-	-	-	-	-
Biosolids Treatment / Compost Facility	-	900,000	-	-	-	-	-	-	-	-	-
Master Utility Planning	-	1,000,000	-	-	-	-	-	-	-	-	-
Wastewater Treatment Plant Cleaning	-	160,000	-	-	218,600	90,080	92,720	-	-	-	-
Riverwalk Utilities	-	200,000	-	-	-	-	-	-	-	-	-
Vehicle Replacement	-	370,000	82,915	272,677	52,464	213,940	119,377	-	-	-	-
Unspecified Future Capital Projects	-	-	-	-	-	-	-	9,754,741	10,498,124	11,579,204	10,359,725
FY15 CIP	9,645,663	-	-	-	-	-	-	-	-	-	-
Total CIP Budget (in FY 2015 dollars)	\$9,645,663	6,128,000	6,533,805	5,851,415	16,550,206	7,147,848	8,693,080	9,754,741	10,498,124	11,579,204	10,359,725
Compounded Annual Cost Escalation	0.0%	0.0%	3.0%	6.1%	9.3%	12.6%	15.9%	19.4%	23.0%	26.7%	30.5%
Annual Capital Spending Execution Percentage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Final CIP Funding Level	\$9,645,663	6,128,000	6,533,805	5,851,415	16,550,206	7,147,848	8,693,080	9,754,741	10,498,124	11,579,204	10,359,725

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 4 – Projection of Cash Inflows

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
<u>Water Rate Revenue</u> ⁽¹⁾											
Base Facility Charges	\$ 4,933,508	4,968,375	5,038,860	5,227,118	5,523,384	5,764,997	5,887,799	6,079,785	6,120,727	6,161,670	6,202,613
Usage Charges	5,310,595	6,067,895	6,092,439	6,256,860	6,545,375	6,763,377	6,838,370	6,990,738	6,967,438	6,943,904	6,920,144
Total Water Rate Revenue	\$ 10,244,103	11,036,270	11,131,299	11,483,978	12,068,758	12,528,374	12,726,169	13,070,523	13,088,165	13,105,574	13,122,756
<u>Reclaimed Rate Revenue</u> ⁽¹⁾											
Base Facility Charges	\$ -	-	-	-	-	-	-	-	-	-	-
Usage Charges	1,156,799	1,156,799	1,153,384	1,176,314	1,222,098	1,254,182	1,259,491	1,278,883	1,266,094	1,253,433	1,240,899
Total Reclaimed Rate Revenue	\$ 1,156,799	1,156,799	1,153,384	1,176,314	1,222,098	1,254,182	1,259,491	1,278,883	1,266,094	1,253,433	1,240,899
<u>Sewer Rate Revenue</u> ⁽¹⁾											
Base Facility Charges	\$ 4,287,942	\$ 4,322,537	\$ 4,388,149	\$ 4,556,485	\$ 4,819,313	\$ 5,034,836	\$ 5,146,828	\$ 5,319,485	\$ 5,360,107	\$ 5,400,729	\$ 5,441,352
Usage Charges	4,650,438	5,718,287	5,832,834	6,047,169	6,418,134	6,700,759	6,803,283	7,003,623	6,982,075	6,960,075	6,937,634
DB Shores Sewer	1,022,334	1,022,334	1,022,334	1,022,334	1,022,334	1,022,334	1,022,334	1,022,334	1,022,334	1,022,334	1,022,334
SW Serv Ponce Inlet	805,708	805,708	805,708	805,708	805,708	805,708	805,708	805,708	805,708	805,708	805,708
Total Sewer Rate Revenue	\$ 10,766,422	11,868,866	12,049,026	12,431,695	13,065,489	13,563,637	13,778,153	14,151,150	14,170,224	14,188,846	14,207,027
Total Rate Revenue	\$ 22,167,325	24,061,935	24,333,709	25,091,988	26,356,346	27,346,193	27,763,812	28,500,556	28,524,484	28,547,853	28,570,683
<u>Other Operating Revenue</u>											
Water Energy Adj Charge	454,228	-	-	-	-	-	-	-	-	-	-
Sewer Energy Adj Charge	439,074	-	-	-	-	-	-	-	-	-	-
Hydrant Rental	42,926	42,926	42,926	42,926	42,926	42,926	42,926	42,926	42,926	42,926	42,926
Reclaimed Backflow Fee	171,875	171,875	171,875	171,875	171,875	171,875	171,875	171,875	171,875	171,875	171,875
Sewer Connect	15,720	15,720	15,720	15,720	15,720	15,720	15,720	15,720	15,720	15,720	15,720
Reclaimed Water Connect	53,487	53,487	53,487	53,487	53,487	53,487	53,487	53,487	53,487	53,487	53,487
Water Connection	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000
Service Charge	562,520	562,520	562,520	562,520	562,520	562,520	562,520	562,520	562,520	562,520	562,520
Misc. Billing Revenue	(928)	-	-	-	-	-	-	-	-	-	-
Scrap Sales	19,910	-	-	-	-	-	-	-	-	-	-
Total Other Operating Revenue	\$ 1,860,810	948,527	948,527	948,527	948,527	948,527	948,527	948,527	948,527	948,527	948,527
Interest Earnings Revenue	\$ 80,253	91,346	118,851	152,522	193,627	238,706	280,813	291,799	303,096	313,397	324,471
<u>Capital Project Funding Sources</u> ⁽³⁾											
Water Development Fees	\$ 540,357	311,000	311,000	311,000	311,000	311,000	311,000	311,000	311,000	311,000	311,000
Sewer Development Fees	266,302	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
Reclaimed Development Fees	-	-	-	-	-	-	-	-	-	-	-
Total Capital Project Funding Sources	\$ 806,659	619,000	619,000	619,000	619,000	619,000	619,000	619,000	619,000	619,000	619,000
TOTAL CASH INFLOWS	\$ 24,915,047	25,720,807	26,020,086	26,812,036	28,117,500	29,152,426	29,612,152	30,359,882	30,395,106	30,428,777	30,462,680

(1) Estimated rate revenues in FY 2015 were based on the FY 2014 actual results and FY 2015 YTD, adjusted for changes in rate structure. Future rate revenue projections are based upon FY 2015 estimated results, adjusted annually to reflect assumed rate increases and customer growth.

(2) Unless otherwise specified, FY 2015 and FY 2016 non-rate revenues are per the FY 2015 and FY 2016 Budgets.

(3) Development Fee revenues were calculated based upon the current development fees and the projected growth in development fee paying accounts (see Schedule 1 for annual growth projections).

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 5 – Projection of Cash Outflows

	<u>FY 2015</u> ⁽¹⁾	<u>FY 2016</u> ⁽²⁾	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
WATER PLANT - 200											
Personnel Services											
Salaries & Wages	\$ 621,414	649,347	668,827	688,892	709,559	730,846	752,771	775,354	798,615	822,573	847,251
Overtime	50,000	50,000	51,500	53,045	54,636	56,275	57,964	59,703	61,494	63,339	65,239
Certifications & Licenses	2,100	2,145	2,199	2,254	2,310	2,368	2,427	2,488	2,550	2,613	2,679
FICA Taxes	51,372	53,669	55,279	56,937	58,646	60,405	62,217	64,084	66,006	67,986	70,026
Retirement	75,118	84,713	86,831	89,002	91,227	93,507	95,845	98,241	100,697	103,215	105,795
Health Insurance	80,352	81,937	84,395	86,927	89,535	92,221	94,987	97,837	100,772	103,795	106,909
Workers Comp	10,418	9,513	9,751	9,995	10,244	10,501	10,763	11,032	11,308	11,591	11,880
EAP Benefit	484	484	499	513	529	545	561	578	595	613	632
Operating											
Professional Services	\$ 49,470	38,700	39,668	40,659	41,676	42,718	43,785	44,880	46,002	47,152	48,331
Landfill Services	40,000	40,000	41,000	42,025	43,076	44,153	45,256	46,388	47,547	48,736	49,955
Mowing Contract	12,480	15,000	15,375	15,759	16,153	16,557	16,971	17,395	17,830	18,276	18,733
Travel Per Diem	7,000	7,000	7,175	7,354	7,538	7,727	7,920	8,118	8,321	8,529	8,742
Training	1,000	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
Communication Services	30,355	14,965	15,339	15,723	16,116	16,519	16,932	17,355	17,789	18,233	18,689
Electrical Services	508,000	541,000	568,050	596,453	626,275	657,589	690,468	724,992	761,241	799,303	839,269
Water / Sewer (UT Billing)	1,900	1,900	1,948	1,996	2,046	2,097	2,150	2,203	2,259	2,315	2,373
Drainage (UT Billing)	2,000	2,000	2,050	2,101	2,154	2,208	2,263	2,319	2,377	2,437	2,498
Equipment Rental & Leasing	1,000	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
Vehicle Insurance	1,576	745	764	783	802	822	843	864	886	908	930
Equipment Maintenance	1,000	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
Maintenance Inspection Svc	3,200	3,200	3,280	3,362	3,446	3,532	3,621	3,711	3,804	3,899	3,996
Vehicle Maintenance	16,344	16,344	16,753	17,171	17,601	18,041	18,492	18,954	19,428	19,914	20,411
Building Maintenance	2,500	2,500	2,563	2,627	2,692	2,760	2,829	2,899	2,972	3,046	3,122
Cont Mant/Comm Eq	1,000	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
Computer Software	300	300	308	315	323	331	339	348	357	366	375
Taxes,Licenses,fees	21,025	21,025	21,551	22,089	22,642	23,208	23,788	24,383	24,992	25,617	26,257
Equipment NON Capital	5,000	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
Office Supplies	3,000	3,000	3,075	3,152	3,231	3,311	3,394	3,479	3,566	3,655	3,747
Other Operating Supplies	15,000	15,000	15,375	15,759	16,153	16,557	16,971	17,395	17,830	18,276	18,733
Fuel, Oil, Grease	21,000	14,517	14,880	15,252	15,633	16,024	16,425	16,835	17,256	17,688	18,130
Janitorial Supplies	2,450	1,750	1,794	1,839	1,885	1,932	1,980	2,029	2,080	2,132	2,186
Uniforms	4,000	4,000	4,100	4,203	4,308	4,415	4,526	4,639	4,755	4,874	4,995
Medical & Lab Supplies	20,000	25,000	25,625	26,266	26,922	27,595	28,285	28,992	29,717	30,460	31,222
Repair & Maintenance Supplies	5,000	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
Chemicals	631,754	555,920	583,716	612,902	643,547	675,724	709,510	744,986	782,235	821,347	862,414
Dues & Memberships	1,500	1,500	1,538	1,576	1,615	1,656	1,697	1,740	1,783	1,828	1,873
Books & Subscriptions	425	425	436	447	458	469	481	493	505	518	531
Capital Outlay											
Buildings & Improvements	\$ -	-	-	-	-	-	-	-	-	-	-
Machine & Equipment	11,759	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
TOTAL WATER PLANT - 200	\$ 2,312,296	2,276,599	2,365,114	2,457,339	2,553,438	2,653,584	2,757,957	2,866,748	2,980,154	3,098,382	3,221,650

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 5 – Projection of Cash Outflows

	<u>FY 2015</u> ⁽¹⁾	<u>FY 2016</u> ⁽²⁾	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
RECLAIMED PLANT - 400											
Personnel Services											
Salaries & Wages	\$ 628,058	597,970	615,909	634,386	653,418	673,021	693,211	714,007	735,428	757,491	780,215
Overtime	99,103	100,000	103,000	106,090	109,273	112,551	115,927	119,405	122,987	126,677	130,477
Capital Overtime Offset	-	-	-	-	-	-	-	-	-	-	-
Certification/Licenses	1,740	2,145	2,209	2,276	2,344	2,414	2,487	2,561	2,638	2,717	2,799
Fica Taxes	54,481	53,565	55,172	56,827	58,532	60,288	62,097	63,959	65,878	67,855	69,890
Retirement Contributio	75,986	91,211	93,947	96,766	99,669	102,659	105,739	108,911	112,178	115,543	119,010
Health Insurance	80,327	84,537	87,073	89,685	92,376	95,147	98,002	100,942	103,970	107,089	110,302
Workmans Compensation	8,826	7,918	8,156	8,400	8,652	8,912	9,179	9,455	9,738	10,030	10,331
Eap Benefit	484	484	499	513	529	545	561	578	595	613	632
Operating											
Other Prof. Services	\$ 67,535	74,800	76,670	78,587	80,551	82,565	84,629	86,745	88,914	91,137	93,415
Landfill Services	550,000	551,000	564,775	578,894	593,367	608,201	623,406	638,991	654,966	671,340	688,123
Mowing Contract	12,480	15,000	15,375	15,759	16,153	16,557	16,971	17,395	17,830	18,276	18,733
Travel Per Diem	6,800	6,800	6,970	7,144	7,323	7,506	7,694	7,886	8,083	8,285	8,492
Employee Training	2,000	2,000	2,050	2,101	2,154	2,208	2,263	2,319	2,377	2,437	2,498
Communication Services	4,142	4,020	4,121	4,224	4,329	4,437	4,548	4,662	4,779	4,898	5,020
Electrical Services	700,000	810,716	851,252	893,814	938,505	985,430	1,034,702	1,086,437	1,140,759	1,197,797	1,257,687
Water/Sewer Services	4,000	4,000	4,100	4,203	4,308	4,415	4,526	4,639	4,755	4,874	4,995
Drainage	1,300	900	923	946	969	993	1,018	1,044	1,070	1,097	1,124
Vehicle Insurance	1,970	1,118	1,146	1,175	1,204	1,234	1,265	1,297	1,329	1,362	1,396
General Equip Maint	21,000	30,000	30,750	31,519	32,307	33,114	33,942	34,791	35,661	36,552	37,466
Regular Maint/Insp Equ	189,965	76,200	78,105	80,058	82,059	84,111	86,213	88,369	90,578	92,842	95,163
Vehicle Maintenance	8,000	4,000	4,100	4,203	4,308	4,415	4,526	4,639	4,755	4,874	4,995
Cont Maint/Comm Equip	500	500	513	525	538	552	566	580	594	609	624
Taxes, Fees & Licenses	7,100	7,500	7,688	7,880	8,077	8,279	8,486	8,698	8,915	9,138	9,366
Eq Non Capital	8,000	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
Office Supplies	4,000	4,000	4,100	4,203	4,308	4,415	4,526	4,639	4,755	4,874	4,995
Other Operating Suppli	27,600	28,000	28,700	29,418	30,153	30,907	31,679	32,471	33,283	34,115	34,968
Gas,Diesel,Oil,& Greas	4,425	3,242	3,404	3,574	3,753	3,941	4,138	4,345	4,562	4,790	5,029
Janitorial Supplies	5,000	2,500	2,563	2,627	2,692	2,760	2,829	2,899	2,972	3,046	3,122
Uniforms	4,208	4,000	4,100	4,203	4,308	4,415	4,526	4,639	4,755	4,874	4,995
Medical & Lab Supplies	20,000	20,000	20,500	21,013	21,538	22,076	22,628	23,194	23,774	24,368	24,977
Rep & Maint Supplies	14,000	14,000	14,350	14,709	15,076	15,453	15,840	16,236	16,642	17,058	17,484
Chemicals	820,360	770,000	808,500	848,925	891,371	935,940	982,737	1,031,874	1,083,467	1,137,641	1,194,523
Dues & Memberships	536	1,190	1,220	1,250	1,281	1,314	1,346	1,380	1,415	1,450	1,486
Books & Subscriptions	1,000	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
Capital Outlay											
Building And Imp	\$ 22,000	25,000	25,625	26,266	26,922	27,595	28,285	28,992	29,717	30,460	31,222
Mach & Equipment	21,900	-	-	-	-	-	-	-	-	-	-
TOTAL RECLAIMED PLANT - 400	\$ 3,478,826	3,404,316	3,533,712	3,668,464	3,808,808	3,954,993	4,107,278	4,265,935	4,431,249	4,603,517	4,783,051

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 5 – Projection of Cash Outflows

	<u>FY 2015</u> ⁽¹⁾	<u>FY 2016</u> ⁽²⁾	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
METER READING - 500											
Personnel Services											
Salaries & Wages	\$ 369,870	347,061	355,738	364,631	373,747	383,090	392,668	402,484	412,546	422,860	433,432
Overtime	103,573	75,000	76,875	78,797	80,767	82,786	84,856	86,977	89,151	91,380	93,665
Certification/Licenses	-	1,485	1,522	1,560	1,599	1,639	1,680	1,722	1,765	1,809	1,855
Fica Taxes	34,919	32,407	33,217	34,048	34,899	35,771	36,666	37,582	38,522	39,485	40,472
Retirement Contributio	40,094	45,819	46,964	48,139	49,342	50,576	51,840	53,136	54,464	55,826	57,222
Health Insurance	61,403	64,671	66,288	67,945	69,644	71,385	73,169	74,999	76,873	78,795	80,765
Workmans Compensation	5,714	4,621	4,737	4,855	4,976	5,101	5,228	5,359	5,493	5,630	5,771
Eap Benefit	372	372	381	391	401	411	421	431	442	453	465
Operating											
Other Prof. Services	\$ 500	25,500	26,138	26,791	27,461	28,147	28,851	29,572	30,311	31,069	31,846
Travel Per Diem	500	2,000	2,050	2,101	2,154	2,208	2,263	2,319	2,377	2,437	2,498
Employee Training	2,500	3,000	3,075	3,152	3,231	3,311	3,394	3,479	3,566	3,655	3,747
Communication Services	9,568	5,300	5,433	5,568	5,708	5,850	5,996	6,146	6,300	6,458	6,619
Vehicle Insurance	3,546	3,353	3,437	3,523	3,611	3,701	3,794	3,888	3,986	4,085	4,187
General Equip Maint	16,000	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
Regular Maint/Insp Equ	5,250	27,000	27,675	28,367	29,076	29,803	30,548	31,312	32,095	32,897	33,719
Vehicle Maintenance	22,906	22,906	23,479	24,066	24,667	25,284	25,916	26,564	27,228	27,909	28,606
Cont Maint/Comm Equip	500	500	513	525	538	552	566	580	594	609	624
Computer Software	11,000	-	-	-	-	-	-	-	-	-	-
Eq Non Capital	11,000	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
Office Supplies	7,500	3,000	3,075	3,152	3,231	3,311	3,394	3,479	3,566	3,655	3,747
Other Operating Suppli	6,500	7,500	7,688	7,880	8,077	8,279	8,486	8,698	8,915	9,138	9,366
Gas,Diesel,Oil,& Greas	23,450	17,085	17,512	17,950	18,399	18,859	19,330	19,813	20,309	20,816	21,337
Uniforms	2,219	2,000	2,050	2,101	2,154	2,208	2,263	2,319	2,377	2,437	2,498
Postage	500	500	513	525	538	552	566	580	594	609	624
Rep & Maint Supplies	10,000	10,000	10,250	10,506	10,769	11,038	11,314	11,597	11,887	12,184	12,489
Dues & Memberships	100	100	103	105	108	110	113	116	119	122	125
Non-Cap Replc Metr Inst	19,000	20,000	20,500	21,013	21,538	22,076	22,628	23,194	23,774	24,368	24,977
Capital Outlay											
Mach & Equipment	\$ 9,000	-	-	-	-	-	-	-	-	-	-
Adp Equipment	5,000	-	-	-	-	-	-	-	-	-	-
TOTAL METER READING - 500	\$ 782,484	731,180	749,460	768,196	787,401	807,086	827,263	847,945	869,143	890,872	913,144

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 5 – Projection of Cash Outflows

	<u>FY 2015 ⁽¹⁾</u>	<u>FY 2016 ⁽²⁾</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
MAINTENANCE- 600											
Personnel Services											
Salaries & Wages	\$ 534,537	597,897	612,844	628,166	643,870	659,966	676,466	693,377	710,712	728,479	746,691
Overtime	45,393	50,000	51,250	52,531	53,845	55,191	56,570	57,985	59,434	60,920	62,443
Certification/Licenses	1,200	2,310	2,368	2,427	2,488	2,550	2,614	2,679	2,746	2,815	2,885
Fica Taxes	50,846	49,747	50,991	52,265	53,572	54,911	56,284	57,691	59,134	60,612	62,127
Retirement Contributio	74,151	82,225	84,281	86,388	88,547	90,761	93,030	95,356	97,740	100,183	102,688
Health Insurance	92,399	90,894	93,166	95,496	97,883	100,330	102,838	105,409	108,044	110,746	113,514
Eap Benefit	558	521	534	547	561	575	589	604	619	635	651
Operating											
Contract Services	\$ 700	1,440	1,476	1,513	1,551	1,589	1,629	1,670	1,712	1,755	1,798
Mowing Contract	34,495	26,250	26,906	27,579	28,268	28,975	29,699	30,442	31,203	31,983	32,783
Travel Per Diem	500	1,500	1,538	1,576	1,615	1,656	1,697	1,740	1,783	1,828	1,873
Employee Training	9,000	9,000	9,225	9,456	9,692	9,934	10,183	10,437	10,698	10,966	11,240
Communication Services	5,200	6,708	6,876	7,048	7,224	7,404	7,589	7,779	7,974	8,173	8,377
Eq Rental / Leasing	5,850	5,850	5,996	6,146	6,300	6,457	6,619	6,784	6,954	7,128	7,306
Vehicle Insurance	4,334	3,726	3,819	3,915	4,012	4,113	4,216	4,321	4,429	4,540	4,653
General Equip Maint	260,838	270,000	276,750	283,669	290,760	298,029	305,480	313,117	320,945	328,969	337,193
Regular Maint/Insp Equ	32,295	35,000	35,875	36,772	37,691	38,633	39,599	40,589	41,604	42,644	43,710
Vehicle Maintenance	41,000	41,000	42,025	43,076	44,153	45,256	46,388	47,547	48,736	49,955	51,203
Building Maintenance	4,000	4,000	4,100	4,203	4,308	4,415	4,526	4,639	4,755	4,874	4,995
Cont Maint/Comm Equip	3,800	3,800	3,895	3,992	4,092	4,194	4,299	4,407	4,517	4,630	4,746
Computer Software	2,500	2,500	2,563	2,627	2,692	2,760	2,829	2,899	2,972	3,046	3,122
Eq Non Capital	17,620	10,000	10,250	10,506	10,769	11,038	11,314	11,597	11,887	12,184	12,489
Office Supplies	2,500	2,500	2,563	2,627	2,692	2,760	2,829	2,899	2,972	3,046	3,122
Other Operating Suppli	10,000	10,000	10,250	10,506	10,769	11,038	11,314	11,597	11,887	12,184	12,489
Gas,Diesel,Oil,& Greas	67,813	75,964	77,863	79,810	81,805	83,850	85,946	88,095	90,297	92,555	94,869
Janitorial Supplies	1,600	2,400	2,460	2,522	2,585	2,649	2,715	2,783	2,853	2,924	2,997
Uniforms	4,738	4,000	4,100	4,203	4,308	4,415	4,526	4,639	4,755	4,874	4,995
Rep & Maint Supplies	200,000	240,000	246,000	252,150	258,454	264,915	271,538	278,326	285,285	292,417	299,727
Chemicals	2,500	3,000	3,075	3,152	3,231	3,311	3,394	3,479	3,566	3,655	3,747
Dues & Memberships	850	350	359	368	377	386	396	406	416	426	437
Capital Outlay											
Mach & Equipment	\$ 28,300	25,000	25,625	26,266	26,922	27,595	28,285	28,992	29,717	30,460	31,222
TOTAL MAINTENANCE- 600	\$ 1,549,661	1,666,417	1,708,077	1,750,779	1,794,549	1,839,413	1,885,398	1,932,533	1,980,846	2,030,367	2,081,126

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 5 – Projection of Cash Outflows

	<u>FY 2015</u> ⁽¹⁾	<u>FY 2016</u> ⁽²⁾	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
FIELD OPERATIONS- 800											
Personnel Services											
Salaries & Wages	\$ 624,928	615,751	631,145	646,923	663,096	679,674	696,666	714,082	731,934	750,233	768,989
Overtime	82,569	120,000	123,000	126,075	129,227	132,458	135,769	139,163	142,642	146,208	149,864
Certification/Licenses	1,700	3,536	3,624	3,715	3,808	3,903	4,001	4,101	4,203	4,308	4,416
Fica Taxes	61,974	56,566	57,980	59,430	60,915	62,438	63,999	65,599	67,239	68,920	70,643
Retirement Contributio	80,545	91,067	93,344	95,677	98,069	100,521	103,034	105,610	108,250	110,956	113,730
Health Insurance	128,779	129,147	132,376	135,685	139,077	142,554	146,118	149,771	153,515	157,353	161,287
Workmans Compensation	9,821	8,536	8,749	8,968	9,192	9,422	9,658	9,899	10,147	10,400	10,660
Eap Benefit	781	744	763	782	801	821	842	863	884	906	929
Operating											
Other Prof. Services	\$ 170,432	15,000	15,375	15,759	16,153	16,557	16,971	17,395	17,830	18,276	18,733
Contract Services	15,000	155,000	158,875	162,847	166,918	171,091	175,368	179,752	184,246	188,852	193,574
Travel Per Diem	5,500	15,100	15,478	15,864	16,261	16,668	17,084	17,511	17,949	18,398	18,858
Employee Training	3,750	6,000	6,150	6,304	6,461	6,623	6,788	6,958	7,132	7,310	7,493
Communication Services	9,779	6,100	6,253	6,409	6,569	6,733	6,902	7,074	7,251	7,432	7,618
Eq Rental / Leasing	1,000	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
Inventory Short/Over	-	-	-	-	-	-	-	-	-	-	-
Vehicle Insurance	6,698	6,334	6,492	6,655	6,821	6,992	7,166	7,345	7,529	7,717	7,910
General Equip Maint	10,500	10,500	10,763	11,032	11,307	11,590	11,880	12,177	12,481	12,793	13,113
Regular Maint/Insp Equ	1,500	2,000	2,050	2,101	2,154	2,208	2,263	2,319	2,377	2,437	2,498
Vehicle Maintenance	45,000	45,000	46,125	47,278	48,460	49,672	50,913	52,186	53,491	54,828	56,199
Building Maintenance	2,500	2,500	2,563	2,627	2,692	2,760	2,829	2,899	2,972	3,046	3,122
Cont Maint/Comm Equip	4,000	2,500	2,563	2,627	2,692	2,760	2,829	2,899	2,972	3,046	3,122
Printing & Binding	500	500	513	525	538	552	566	580	594	609	624
Computer Software	2,000	-	-	-	-	-	-	-	-	-	-
Eq Non Capital	5,000	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
Office Supplies	3,000	3,000	3,075	3,152	3,231	3,311	3,394	3,479	3,566	3,655	3,747
Other Operating Suppli	58,000	58,000	59,450	60,936	62,460	64,021	65,622	67,262	68,944	70,667	72,434
Gas,Diesel,Oil,& Greas	43,075	33,054	33,880	34,727	35,596	36,485	37,398	38,333	39,291	40,273	41,280
Janitorial Supplies	2,500	2,500	2,563	2,627	2,692	2,760	2,829	2,899	2,972	3,046	3,122
Uniforms	6,933	6,000	6,150	6,304	6,461	6,623	6,788	6,958	7,132	7,310	7,493
Rep & Maint Supplies	60,000	75,000	76,875	78,797	80,767	82,786	84,856	86,977	89,151	91,380	93,665
Road Material & Supply	26,190	35,000	35,875	36,772	37,691	38,633	39,599	40,589	41,604	42,644	43,710
Dues & Memberships	450	450	461	473	485	497	509	522	535	548	562
Books & Subscriptions	250	350	359	368	377	386	396	406	416	426	437
Non-Cap Replc Mtr Repl	876,500	50,000	51,250	52,531	53,845	55,191	56,570	57,985	59,434	60,920	62,443
Non-Cap Replc Metr Inst	52,000	100,000	102,500	105,063	107,689	110,381	113,141	115,969	118,869	121,840	124,886
Capital Outlay											
Other Than Bld, Prof Svc	\$ 25,000	-	-	-	-	-	-	-	-	-	-
Mach & Equipment	20,000	10,000	10,250	10,506	10,769	11,038	11,314	11,597	11,887	12,184	12,489
Adp Equipment	28,200	-	-	-	-	-	-	-	-	-	-
Cap New Mtr Inst	50,000	50,000	51,250	52,531	53,845	55,191	56,570	57,985	59,434	60,920	62,443
TOTAL FIELD OPERATIONS- 800	\$ 2,526,354	1,721,235	1,764,266	1,808,373	1,853,582	1,899,921	1,947,419	1,996,105	2,046,008	2,097,158	2,149,587

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 5 – Projection of Cash Outflows

	<u>FY 2015</u> ⁽¹⁾	<u>FY 2016</u> ⁽²⁾	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
LAB OPERATIONS - 0824											
Personnel Services											
Salaries & Wages	\$ 232,676	191,669	196,461	201,372	206,407	211,567	216,856	222,277	227,834	233,530	239,368
Overtime	14,500	17,500	17,938	18,386	18,846	19,317	19,800	20,295	20,802	21,322	21,855
Certification/Licenses	3,000	660	677	693	711	729	747	765	785	804	824
Fica Taxes	18,912	16,054	16,455	16,867	17,288	17,721	18,164	18,618	19,083	19,560	20,049
Retirement Contributio	29,301	25,989	26,639	27,305	27,987	28,687	29,404	30,139	30,893	31,665	32,457
Health Insurance	24,853	26,023	26,674	27,340	28,024	28,725	29,443	30,179	30,933	31,706	32,499
Workmans Compensation	3,300	2,582	2,647	2,713	2,781	2,850	2,921	2,994	3,069	3,146	3,225
Eap Benefit	149	149	153	157	160	164	169	173	177	182	186
Operating											
Other Prof. Services	\$ 171,587	130,000	133,250	136,581	139,996	143,496	147,083	150,760	154,529	158,392	162,352
Travel Per Diem	2,500	2,500	2,563	2,627	2,692	2,760	2,829	2,899	2,972	3,046	3,122
Employee Training	610	500	513	525	538	552	566	580	594	609	624
Communication Services	1,142	500	513	525	538	552	566	580	594	609	624
Vehicle Insurance	788	745	764	783	802	822	843	864	886	908	930
General Equip Maint	500	500	513	525	538	552	566	580	594	609	624
Regular Maint/Insp Equ	500	500	513	525	538	552	566	580	594	609	624
Vehicle Maintenance	5,715	5,715	5,858	6,004	6,154	6,308	6,466	6,628	6,793	6,963	7,137
Printing & Binding	100	-	-	-	-	-	-	-	-	-	-
Taxes, Fees & Licenses	3,000	3,000	3,075	3,152	3,231	3,311	3,394	3,479	3,566	3,655	3,747
Eq Non Capital	1,000	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
Office Supplies	1,050	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
Other Operating Suppli	2,000	2,000	2,050	2,101	2,154	2,208	2,263	2,319	2,377	2,437	2,498
Gas,Diesel,Oil,& Greas	2,713	1,976	2,025	2,076	2,128	2,181	2,236	2,292	2,349	2,408	2,468
Janitorial Supplies	800	800	820	841	862	883	905	928	951	975	999
Uniforms	1,000	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
Medical & Lab Supplies	36,200	35,000	35,875	36,772	37,691	38,633	39,599	40,589	41,604	42,644	43,710
Rep & Maint Supplies	450	450	461	473	485	497	509	522	535	548	562
Dues & Memberships	650	650	666	683	700	717	735	754	773	792	812
Books & Subscriptions	200	200	205	210	215	221	226	232	238	244	250
Capital Outlay											
Mach & Equipment	\$ 10,000	-	-	-	-	-	-	-	-	-	-
TOTAL LAB OPERATIONS - 0824	\$ 569,196	468,662	480,379	492,388	504,698	517,315	530,248	543,504	557,092	571,019	585,295

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 5 – Projection of Cash Outflows

	<u>FY 2015</u> ⁽¹⁾	<u>FY 2016</u> ⁽²⁾	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
ADMINISTRATION - 900											
Personnel Services											
Salaries & Wages	\$ 649,787	718,089	736,041	754,442	773,303	792,636	812,452	832,763	853,582	874,922	896,795
Car Allowance	1,500	-	-	-	-	-	-	-	-	-	-
Add. Salary & Benefits	3,000	-	-	-	-	-	-	-	-	-	-
Overtime	6,633	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
Certification/Licenses	1,000	3,330	3,413	3,499	3,586	3,676	3,768	3,862	3,958	4,057	4,159
Fica Taxes	50,493	55,577	56,966	58,391	59,850	61,347	62,880	64,452	66,064	67,715	69,408
Retirement Contributio	83,781	101,559	104,098	106,700	109,368	112,102	114,905	117,777	120,722	123,740	126,833
Health Insurance	64,632	67,971	69,670	71,412	73,197	75,027	76,903	78,826	80,796	82,816	84,886
Workmans Compensation	5,480	6,573	6,737	6,906	7,078	7,255	7,437	7,623	7,813	8,009	8,209
Unemployment Comp	923	-	-	-	-	-	-	-	-	-	-
Eap Benefit	384	384	394	403	414	424	434	445	456	468	480
Operating											
Other Prof. Services	\$ 71,147	100,000	102,500	105,063	107,689	110,381	113,141	115,969	118,869	121,840	124,886
Water Authority	6,000	-	-	-	-	-	-	-	-	-	-
Travel Per Diem	1,125	1,125	1,153	1,182	1,212	1,242	1,273	1,305	1,337	1,371	1,405
Employee Training	4,800	4,800	4,920	5,043	5,169	5,298	5,431	5,567	5,706	5,848	5,995
Communication Services	1,513	2,520	2,583	2,648	2,714	2,782	2,851	2,922	2,995	3,070	3,147
Eq Rental / Leasing	1,000	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
Vehicle Insurance	788	745	764	783	802	822	843	864	886	908	930
Regular Maint/Insp Equ	1,236	500	513	525	538	552	566	580	594	609	624
Vehicle Maintenance	4,000	4,000	4,100	4,203	4,308	4,415	4,526	4,639	4,755	4,874	4,995
Building Maintenance	1,000	500	513	525	538	552	566	580	594	609	624
Cont Maint/Comm Equip	1,800	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
Printing & Binding	2,000	500	513	525	538	552	566	580	594	609	624
Pub Relation Activity	3,000	-	-	-	-	-	-	-	-	-	-
Public Relations	-	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
Advertising	1,000	-	-	-	-	-	-	-	-	-	-
Computer Software	6,632	-	-	-	-	-	-	-	-	-	-
Taxes, Fees & Licenses	11,579	15,000	15,375	15,759	16,153	16,557	16,971	17,395	17,830	18,276	18,733
Eq Non Capital	17,000	-	-	-	-	-	-	-	-	-	-
Office Supplies	5,000	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
Other Operating Suppli	6,851	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
Gas,Diesel,Oil,& Greas	1,138	2,000	2,050	2,101	2,154	2,208	2,263	2,319	2,377	2,437	2,498
Postage	500	500	513	525	538	552	566	580	594	609	624
Dues & Memberships	6,800	6,800	6,970	7,144	7,323	7,506	7,694	7,886	8,083	8,285	8,492
Books & Subscriptions	750	750	769	788	808	828	849	870	892	914	937
TOTAL ADMINISTRATION - 900	\$ 1,024,272	1,115,223	1,143,104	1,171,681	1,200,973	1,230,998	1,261,772	1,293,317	1,325,650	1,358,791	1,392,761

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 5 – Projection of Cash Outflows

	<u>FY 2015 ⁽¹⁾</u>	<u>FY 2016 ⁽²⁾</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
WAREHOUSE - 901											
Personnel Services											
Salaries & Wages	\$ 63,748	66,177	67,831	69,527	71,265	73,047	74,873	76,745	78,664	80,630	82,646
Compensated Absence	-	-	-	-	-	-	-	-	-	-	-
Capital Labor Offset	-	-	-	-	-	-	-	-	-	-	-
Overtime	12,000	4,000	4,100	4,203	4,308	4,415	4,526	4,639	4,755	4,874	4,995
Capital Overtime Offset	-	-	-	-	-	-	-	-	-	-	-
Certification/Licenses	-	165	169	173	178	182	187	191	196	201	206
Fica Taxes	5,030	5,382	5,517	5,654	5,796	5,941	6,089	6,241	6,398	6,557	6,721
Retirement Contributio	7,306	10,391	10,651	10,917	11,190	11,470	11,756	12,050	12,352	12,660	12,977
Health Insurance	12,251	12,915	13,238	13,569	13,908	14,256	14,612	14,977	15,352	15,736	16,129
Workmans Compensation	603	630	646	662	678	695	713	731	749	768	787
Unemployment Comp	-	-	-	-	-	-	-	-	-	-	-
Eap Benefit	112	112	115	118	121	124	127	130	133	136	140
Operating											
Other Prof. Services	\$ 1,200	1,200	1,230	1,261	1,292	1,325	1,358	1,392	1,426	1,462	1,499
Landfill Services	-	-	-	-	-	-	-	-	-	-	-
Temp Help	-	-	-	-	-	-	-	-	-	-	-
Travel Per Diem	1,000	1,500	1,538	1,576	1,615	1,656	1,697	1,740	1,783	1,828	1,873
Employee Training	2,000	510	523	536	549	563	577	591	606	621	637
Communication Services	1,000	1,930	1,978	2,028	2,078	2,130	2,184	2,238	2,294	2,352	2,410
Electrical Services	-	-	-	-	-	-	-	-	-	-	-
Water/Sewer Services	-	-	-	-	-	-	-	-	-	-	-
Drainage	-	-	-	-	-	-	-	-	-	-	-
Eq Rental / Leasing	1,000	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
Inventory Short/Over	-	-	-	-	-	-	-	-	-	-	-
Vehicle Insurance	394	373	382	392	402	412	422	433	443	454	466
General Equip Maint	550	550	564	578	592	607	622	638	654	670	687
Regular Maint/Insp Equ	500	500	513	525	538	552	566	580	594	609	624
Vehicle Maintenance	2,380	2,880	2,952	3,026	3,101	3,179	3,258	3,340	3,423	3,509	3,597
Building Maintenance	500	500	513	525	538	552	566	580	594	609	624
Cont Maint/Comm Equip	500	500	513	525	538	552	566	580	594	609	624
Printing & Binding	100	100	103	105	108	110	113	116	119	122	125
Advertising	-	-	-	-	-	-	-	-	-	-	-
Computer Software	1,500	1,500	1,538	1,576	1,615	1,656	1,697	1,740	1,783	1,828	1,873
Taxes, Fees & Licenses	-	-	-	-	-	-	-	-	-	-	-
Eq Non Capital	1,000	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
Building Maintenance	9,393	15,360	15,744	16,138	16,541	16,955	17,378	17,813	18,258	18,715	19,183
Office Supplies	2,500	2,500	2,563	2,627	2,692	2,760	2,829	2,899	2,972	3,046	3,122
Other Operating Suppli	7,500	7,500	7,688	7,880	8,077	8,279	8,486	8,698	8,915	9,138	9,366
Gas,Diesel,Oil,& Greas	700	500	513	525	538	552	566	580	594	609	624
Janitorial Supplies	-	-	-	-	-	-	-	-	-	-	-
Uniforms	500	500	513	525	538	552	566	580	594	609	624
Postage	500	500	513	525	538	552	566	580	594	609	624
Dues & Memberships	600	100	103	105	108	110	113	116	119	122	125
Books & Subscriptions	100	300	308	315	323	331	339	348	357	366	375
TOTAL WAREHOUSE - 901	\$ 136,467	141,075	144,602	148,217	151,922	155,720	159,613	163,604	167,694	171,886	176,183

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 5 – Projection of Cash Outflows

	<u>FY 2015 ⁽¹⁾</u>	<u>FY 2016 ⁽²⁾</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
Incremental O&M From Capital Projects	\$ -	11,864	11,864	11,864	11,864	73,364	75,896	77,794	79,738	81,732	83,775
DEPT 300- NON-DEPARTMENTAL											
Other Professional Services	\$ 3,265	-	-	-	-	-	-	-	-	-	-
Fleet Charges	4,207	4,207	4,312	4,420	4,530	4,644	4,760	4,879	5,001	5,126	5,254
Taxes, Licenses, & Fees	155,967	155,967	159,866	163,863	167,959	172,158	176,462	180,874	185,396	190,031	194,781
Data Processing 501	412,856	461,472	473,009	484,834	496,955	509,379	522,113	535,166	548,545	562,259	576,315
Insurance 504	324,078	349,192	357,922	366,870	376,042	385,443	395,079	404,956	415,080	425,457	436,093
Admin Service Fees	681,453	951,682	975,474	999,861	1,024,857	1,050,479	1,076,741	1,103,659	1,131,251	1,159,532	1,188,520
Mach & Equipment	7,000	-	-	-	-	-	-	-	-	-	-
Principal Internal Loans	249,753	254,723	261,091	267,618	274,309	281,167	288,196	295,401	302,786	310,355	318,114
Interest Internal Loans	10,040	5,070	5,197	5,327	5,460	5,596	5,736	5,880	6,027	6,177	6,332
Vcog	19,259	-	-	-	-	-	-	-	-	-	-
TOTAL DEPT 300- NON-DEPARTMENTAL	\$ 1,867,878	2,182,313	2,236,871	2,292,793	2,350,112	2,408,865	2,469,087	2,530,814	2,594,084	2,658,936	2,725,410
DEPT 301 - NON-DEPARTMENTAL PILOT											
Pilot	\$ 1,260,543	1,225,404	1,262,166	1,300,031	1,339,032	1,379,203	1,420,579	1,463,196	1,507,092	1,552,305	1,598,874
CUSTOMER SERVICE - 100											
Personnel Services											
Salaries & Wages	\$ 380,669	375,590	384,980	394,604	404,469	414,581	424,946	435,569	446,458	457,620	469,060
Overtime	6,000	7,500	7,688	7,880	8,077	8,279	8,486	8,698	8,915	9,138	9,366
Fica Taxes	29,573	29,313	30,046	30,797	31,567	32,356	33,165	33,994	34,844	35,715	36,608
Retirement	41,677	42,737	43,805	44,901	46,023	47,174	48,353	49,562	50,801	52,071	53,373
Health Insurance	77,173	77,538	79,476	81,463	83,500	85,587	87,727	89,920	92,168	94,473	96,834
Workers Comp	357	299	306	314	322	330	338	347	355	364	373
Eap Benefit	521	484	496	509	521	534	548	561	575	590	604
Operating											
Professional Services	\$ 35,350	28,540	29,254	29,985	30,734	31,503	32,290	33,098	33,925	34,773	35,643
Audit Fee	14,250	13,500	13,838	14,183	14,538	14,901	15,274	15,656	16,047	16,448	16,860
Temp Help	-	-	-	-	-	-	-	-	-	-	-
Travel Per Diem	2,000	2,000	2,050	2,101	2,154	2,208	2,263	2,319	2,377	2,437	2,498
Training	1,300	1,300	1,333	1,366	1,400	1,435	1,471	1,508	1,545	1,584	1,624
Communication Services	5,040	4,800	4,920	5,043	5,169	5,298	5,431	5,567	5,706	5,848	5,995
Equipment Rental & Leasing	-	1,500	1,538	1,576	1,615	1,656	1,697	1,740	1,783	1,828	1,873
Fleet Charges	26,482	26,482	27,144	27,823	28,518	29,231	29,962	30,711	31,479	32,266	33,072
Equipment Maintenance	18,612	16,330	16,738	17,157	17,586	18,025	18,476	18,938	19,411	19,897	20,394
Maintenance Inspection Svc	-	-	-	-	-	-	-	-	-	-	-
Software Maintenance	14,000	14,000	14,350	14,709	15,076	15,453	15,840	16,236	16,642	17,058	17,484
Printing	41,180	41,180	42,210	43,265	44,346	45,455	46,591	47,756	48,950	50,174	51,428
Other Charges For Services	22,000	22,300	22,858	23,429	24,015	24,615	25,230	25,861	26,508	27,170	27,850
Taxes,Licenses,Fees	4,000	4,000	4,100	4,203	4,308	4,415	4,526	4,639	4,755	4,874	4,995
Equipment Non Capital	11,700	1,600	1,640	1,681	1,723	1,766	1,810	1,856	1,902	1,949	1,998
Building Maintenance	-	37,533	38,471	39,433	40,419	41,429	42,465	43,527	44,615	45,730	46,874
Office Supplies	6,750	6,000	6,150	6,304	6,461	6,623	6,788	6,958	7,132	7,310	7,493
Other Operating Supplies	4,000	4,000	4,100	4,203	4,308	4,415	4,526	4,639	4,755	4,874	4,995
Postal Service	142,800	146,500	150,163	153,917	157,764	161,709	165,751	169,895	174,142	178,496	182,958
Capital Outlay											
Machine & Equipment	\$ 15,000	-	-	-	-	-	-	-	-	-	-
TOTAL CUSTOMER SERVICE - 100	\$ 900,434	905,026	927,652	950,843	974,614	998,979	1,023,954	1,049,553	1,075,792	1,102,686	1,130,253

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 5 – Projection of Cash Outflows

	<u>FY 2015</u> ⁽¹⁾	<u>FY 2016</u> ⁽²⁾	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
<u>Transfers Out</u>											
Veh Maint Mthly Transf	\$ 16,344	16,344	16,344	16,344	16,344	16,344	16,344	16,344	16,344	16,344	16,344
Veh Maint Mthly Transf	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000
Veh Maint Mthly Transf (Dept 500)	22,906	22,906	22,906	22,906	22,906	22,906	22,906	22,906	22,906	22,906	22,906
Transfer To 506 Bld Maint (Dept 500)	9,596	9,596	9,596	9,596	9,596	9,596	9,596	9,596	9,596	9,596	9,596
Veh Maint Mthly Transf	41,000	41,000	41,000	41,000	41,000	41,000	41,000	41,000	41,000	41,000	41,000
Veh Maint Mthly Transf	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
Veh Maint Mthly Transf	5,715	5,715	5,715	5,715	5,715	5,715	5,715	5,715	5,715	5,715	5,715
Veh Maint Mthly Transf	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Transfer To 506 Bld Maint (Dept 900)	94,409	94,409	94,409	94,409	94,409	94,409	94,409	94,409	94,409	94,409	94,409
Veh Maint Mthly Transf	2,380	2,380	2,380	2,380	2,380	2,380	2,380	2,380	2,380	2,380	2,380
Transfer To 506 Bld Tr (Dept 901)	9,393	9,393	9,393	9,393	9,393	9,393	9,393	9,393	9,393	9,393	9,393
Trans To 403 Ws R&R Fund (Dept 300)	2,400,000	2,402,813	2,501,046	2,528,224	2,604,051	2,730,487	2,829,472	2,871,234	2,944,908	2,947,301	2,949,638
Transfer To 506 (Dept 100)	37,533	37,533	37,533	37,533	37,533	37,533	37,533	37,533	37,533	37,533	37,533
Total: Transfers Out	\$ 2,696,276	2,699,089	2,797,322	2,824,500	2,900,327	3,026,763	3,125,748	3,167,510	3,241,184	3,243,577	3,245,914
<u>Debt Service</u>											
WS 2006	\$ 715,750	-	-	-	-	-	-	-	-	-	-
WS 2009	1,816,788	1,189,350	208,588	-	-	-	-	-	-	-	-
WS 2011	1,280,113	1,283,415	-	-	-	-	-	-	-	-	-
WS 2012	880,768	2,910,292	3,892,624	4,177,768	4,184,172	4,169,432	4,173,548	4,171,388	-	-	-
SRF 3030	295,477	295,477	295,477	295,477	295,477	295,477	295,477	295,477	295,477	295,477	295,477
SRF 5080	76,797	76,797	614,276	614,276	614,276	614,276	307,138	-	-	-	-
SRF 5090	29,469	29,469	291,354	291,354	291,354	145,677	-	-	-	-	-
SRF 513P	914,135	914,135	914,135	914,135	914,135	914,135	914,135	914,135	914,135	-	-
SRF 514S	489,369	489,369	489,369	489,369	489,369	489,369	489,369	489,369	489,369	489,369	489,369
Total: Debt Service	\$ 6,498,665	7,188,303	6,705,821	6,782,378	6,788,782	6,628,365	6,179,666	5,870,369	1,698,981	784,846	784,846
TOTAL CASH OUTFLOWS	\$25,603,352	25,736,707	25,830,409	26,427,844	27,020,102	27,574,569	27,771,880	28,068,926	24,554,707	24,246,075	24,871,868

(1) FY 2015 expenditures based upon the FY 2015 Budget.

(2) FY 2016 expenditures based upon the FY 2016 Budget.

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 6 – Cost Escalation Factors

<u>Annual Cost Escalation Factors:</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
Salaries & Wages									
Compensated Absence	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Capital Labor Offset	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Overtime	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Capital Overtime Offset	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Certification/Licenses	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
FICA Taxes	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Retirement Contributio	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Health Insurance	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Workmans Compensation	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Unemployment Comp	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
EAP Benefit	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Car Allowance	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Add. Salary & Benefits	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Cap Prj Ben Offset	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Other Prof. Services	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Landfill Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Contract Mowing	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Travel Per Diem	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Employee Training	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Communication Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Electrical Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Water/Sewer Services	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Drainage	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Eq Rental / Leasing	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Vehicle Insurance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
General Equip Maint	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Regular Maint/Insp Equ	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Building Maintenance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Cont Maint/Comm Equip	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Advertising	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Computer Software	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Taxes, Fees & Licenses	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Eq Non Capital	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 6 – Cost Escalation Factors

<u>Annual Cost Escalation Factors:</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
Office Supplies	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Other Operating Suppli	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Gas,Diesel,Oil,& Greas	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Janitorial Supplies	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Uniforms	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Postage	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Medical & Lab Supplies	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Rep & Maint Supplies	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Chemicals	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Dues & Memberships	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Books & Subscriptions	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Mowing Contract	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Temp Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Repair And Maint	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Non-Cap Replc Metr Inst	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Contract Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Eq Rental / Leasing	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Printing & Binding	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Computer Hardware	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Road Material & Supply	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Non-Cap Replc Mtr Repl	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Temp Help	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Pub Relation Activity	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Professional Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Mach & Equipment	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
ADP Equipment	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Building And Imp	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Cap New Mtr Inst	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Vehicle Maintenance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Incremental O&M From Capital Projects	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Default Inflation Factor (If Expense Not Listed)	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%

(1) FY 2015 and FY 2016 cost requirements are per the FY 2015 and FY 2016 Budgets.

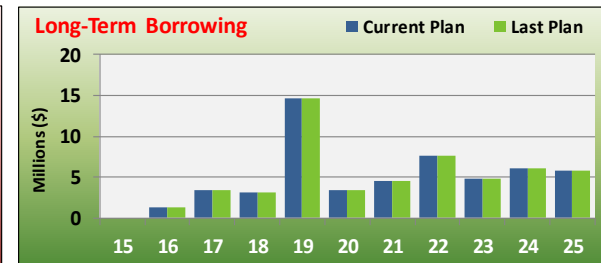
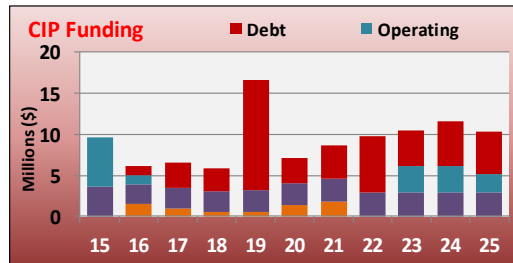
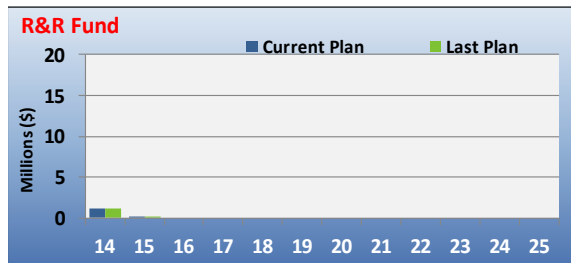
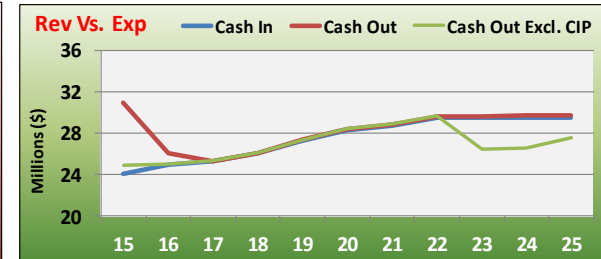
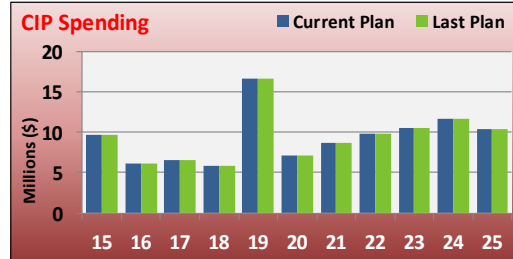
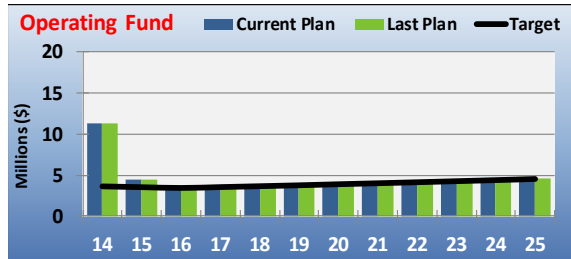
FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

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Schedule 7 – FAMS-XL © Control Panel

FINANCIAL ANALYSIS AND MANAGEMENT SYSTEM (FAMS) SUMMARY

	<u>SAVE</u>	<u>CALC</u>	<u>ROLL</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cumulative Change</u>	
Override ▶															FY 2020	FY 2025
Water Rate Increases				0.00%	0.00%	0.71%	3.02%	4.94%	3.66%	1.44%	2.57%	0.00%	0.00%	0.00%	12.85%	17.26%
Last Plan				0.00%	0.00%	0.71%	3.02%	4.94%	3.66%	1.44%	2.57%	0.00%	0.00%	0.00%	12.85%	17.26%
Override ▶															Elasticity	0.0%
Sewer Rate Increases				0.00%	0.00%	0.71%	3.02%	4.94%	3.66%	1.44%	2.57%	0.00%	0.00%	0.00%		
Last Plan				0.00%	0.00%	0.71%	3.02%	4.94%	3.66%	1.44%	2.57%	0.00%	0.00%	0.00%		
Rate Covenant				2.12	2.08	2.60	2.51	2.32	2.22	2.11	2.00	4.50	3.79	3.21		
CIP \$ Redistribution ▶				\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	PS FY16 ▶	95.0%
CIP Execution % ▶				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	OM FY16 ▶	95.0%
Net CIP Funding % ▶				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	OMF FY16 ▶	95.0%
Operating Reserve Mo ▶				3	3	3	3	3	3	3	3	3	3	3		
Average Bill (4,000 gals.)				\$49.72	49.72	50.07	51.57	54.12	56.08	56.87	58.32	58.32	58.32	58.32		
Last Plan				\$49.72	49.72	50.07	51.57	54.12	56.08	56.87	58.32	58.32	58.32	58.32	Check	\$ (0)



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	<u>FY 2015 ⁽¹⁾</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
1 <u>Rate Revenue Subject to Growth & Rate Adjustments</u>											
2 Fixed and Usage Charge Rate Revenue	\$22,167,325	22,167,325	24,061,935	24,333,709	25,091,988	26,356,346	27,346,193	27,763,812	28,500,556	28,524,484	28,547,853
3 Additional Rate Revenue From Partial PY Rate Increase	-	-	-	-	-	-	-	-	-	-	-
4 Additional Revenue From Growth	-	159,260	99,766	23,138	23,265	23,833	24,119	23,889	23,927	23,370	22,829
5 <u>Weather Normalization And Other Adjustments</u>	-	1,735,350	-	-	-	-	-	-	-	-	-
6 Subtotal: Base Revenue With Growth	\$22,167,325	24,061,935	24,161,701	24,356,847	25,115,253	26,380,178	27,370,312	27,787,701	28,524,484	28,547,853	28,570,683
7 Weighted Average Rate Increase	0.00%	0.00%	0.71%	3.02%	4.94%	3.66%	1.44%	2.57%	0.00%	0.00%	0.00%
8 Additional Rate Revenue From Rate Increase	-	-	172,008	735,141	1,241,093	966,015	393,500	712,855	-	-	-
9 Price Elasticity Adjustment	-	-	-	-	-	-	-	-	-	-	-
10 Total Rate Revenue	\$22,167,325	24,061,935	24,333,709	25,091,988	26,356,346	27,346,193	27,763,812	28,500,556	28,524,484	28,547,853	28,570,683
11 <u>Plus: Other Operating Revenue</u>											
12 Other Operating Revenue	\$ 1,860,810	948,527	948,527	948,527	948,527	948,527	948,527	948,527	948,527	948,527	948,527
13 Equals: Total Operating Revenue	\$24,028,135	25,010,461	25,282,235	26,040,514	27,304,872	28,294,720	28,712,339	29,449,083	29,473,010	29,496,380	29,519,209
14 <u>Less: Operating Expenses</u>											
15 Personal Services	\$ (5,783,464)	(5,910,132)	(6,066,309)	(6,226,642)	(6,391,244)	(6,560,229)	(6,733,715)	(6,911,823)	(7,094,676)	(7,282,402)	(7,475,132)
16 O&M Expenses	(8,373,159)	(7,873,332)	(8,133,555)	(8,403,466)	(8,683,468)	(9,032,405)	(9,336,270)	(9,650,939)	(9,977,538)	(10,316,567)	(10,668,552)
17 Equals: Net Operating Income	\$ 9,871,511	11,226,996	11,082,372	11,410,406	12,230,160	12,702,085	12,642,353	12,886,321	12,400,797	11,897,411	11,375,525
18 <u>Plus: Non-Operating Income/(Expense)</u>											
19 Interest Earned On Fund Balances	\$ 80,253	91,346	118,851	152,522	193,627	238,706	280,813	291,799	303,096	313,397	324,471
20 Water Development Fees	540,357	311,000	311,000	311,000	311,000	311,000	311,000	311,000	311,000	311,000	311,000
21 Sewer Development Fees	266,302	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
22 Reclaimed Development Fees	-	-	-	-	-	-	-	-	-	-	-
23 Renewal & Replacement	2,400,000	2,402,813	2,501,046	2,528,224	2,604,051	2,730,487	2,829,472	2,871,234	2,944,908	2,947,301	2,949,638
24 Equals: Net Income	\$13,158,423	14,340,156	14,321,269	14,710,151	15,646,839	16,290,279	16,371,638	16,668,354	16,267,801	15,777,108	15,268,634
25 <u>Less: Revenues Excluded From Coverage Test</u>											
26 System Development Fees	\$ (806,659)	(619,000)	(619,000)	(619,000)	(619,000)	(619,000)	(619,000)	(619,000)	(619,000)	(619,000)	(619,000)
27 Betterment Fees, Srf, Capital Fund Contributions, R&R	(2,400,000)	(2,402,813)	(2,501,046)	(2,528,224)	(2,604,051)	(2,730,487)	(2,829,472)	(2,871,234)	(2,944,908)	(2,947,301)	(2,949,638)
28 Transfers In	-	-	-	-	-	-	-	-	-	-	-
29 Equals: Net Income Available For Debt Service	\$ 9,951,764	11,318,343	11,201,223	11,562,927	12,423,787	12,940,791	12,923,166	13,178,120	12,703,893	12,210,807	11,699,996
30 <u>Senior-Lien Debt Service Coverage Test</u>											
31 Existing Debt Service	\$ 4,693,419	5,383,057	4,101,212	4,177,768	4,184,172	4,169,432	4,173,548	4,171,388	-	-	-
32 New Debt Service	-	-	-	-	-	-	-	-	-	-	-
33 Cumulative New Debt Service	-	47,116	213,938	427,636	1,160,652	1,650,041	1,947,723	2,420,486	2,820,095	3,223,418	3,639,371
34 Total Senior-Lien Debt Service	\$ 4,693,419	5,430,173	4,315,150	4,605,404	5,344,824	5,819,473	6,121,271	6,591,874	2,820,095	3,223,418	3,639,371
35 Calculated Debt Service Coverage (Test I)	1.50 Req. 2.12	2.08	2.60	2.51	2.32	2.22	2.11	2.00	4.50	3.79	3.21
36 Calculated Debt Service Coverage (Test II)	1.50 Req. 2.29	2.20	2.74	2.65	2.44	2.33	2.21	2.09	4.72	3.98	3.38

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT
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Schedule 8 – Pro Forma

	FY 2015 ⁽¹⁾	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
37 <u>SRF Debt Service</u>											
38 Total SRF Debt Service	\$ 1,805,246	1,805,246	2,604,610	2,604,610	2,604,610	2,458,933	2,006,118	1,698,981	1,698,981	784,846	784,846
39 <u>Calculated SRF Debt Coverage</u>	2.26	2.51	2.23	2.23	2.20	2.30	2.63	2.91	5.40	10.42	9.11
40 <u>Cash Flow Test</u>											
41 Net Income Available For Debt Service	\$ 9,951,764	11,318,343	11,201,223	11,562,927	12,423,787	12,940,791	12,923,166	13,178,120	12,703,893	12,210,807	11,699,996
42 Net Interfund Transfers (In - Out)	(2,696,276)	(2,699,089)	(2,797,322)	(2,824,500)	(2,900,327)	(3,026,763)	(3,125,748)	(3,167,510)	(3,241,184)	(3,243,577)	(3,245,914)
43 Net Debt Service Pymt. (Debt Service - System Devt. Fees Pymt.)	(6,498,665)	(7,235,419)	(6,919,760)	(7,210,014)	(7,949,434)	(8,278,406)	(8,127,390)	(8,290,855)	(4,519,076)	(4,008,264)	(4,424,217)
44 Other Below The Line Expenses	(1,260,543)	(1,225,404)	(1,262,166)	(1,300,031)	(1,339,032)	(1,379,203)	(1,420,579)	(1,463,196)	(1,507,092)	(1,552,305)	(1,598,874)
45 Capital Outlay	(246,159)	(115,000)	(117,875)	(120,822)	(123,842)	(126,938)	(130,112)	(133,365)	(136,699)	(140,116)	(143,619)
46 <u>Net Cash Flow</u>	\$ (749,879)	43,430	104,100	107,561	111,151	129,481	119,338	123,194	3,299,841	3,266,545	2,287,371
47 <u>Unrestricted Working Capital Reserve Fund Test</u>											
48 Balance At Beginning Of Fiscal Year	\$11,266,179	4,434,242	3,445,866	3,549,966	3,657,527	3,768,678	3,898,159	4,017,496	4,140,690	4,268,053	4,399,742
49 Cash Flow Surplus/(Deficit)	-	43,430	104,100	107,561	111,151	129,481	119,338	123,194	3,299,841	3,266,545	2,287,371
50 Cash Flow Deficit Paid with Unrestricted Reserve Fund Balance	(749,879)	-	-	-	-	-	-	-	-	-	-
51 Projects Designated to be Paid with Cash	-	-	-	-	-	-	-	-	-	-	-
52 Projects Paid with Unrestricted Reserve Fund Balance	(6,082,059)	(1,031,806)	-	-	-	-	-	-	(3,172,479)	(3,134,856)	(2,151,192)
53 <u>Balance At End Of Fiscal Year</u>	\$ 4,434,242	3,445,866	3,549,966	3,657,527	3,768,678	3,898,159	4,017,496	4,140,690	4,268,053	4,399,742	4,535,921
54 Minimum Working Capital Reserve Target	3,539,156	3,445,866	3,549,966	3,657,527	3,768,678	3,898,159	4,017,496	4,140,690	4,268,053	4,399,742	4,535,921
55 <u>Excess Working Capital Above Target</u>	\$ 895,086	-	-	-	-	-	-	-	-	-	-

(1) Estimated rate revenues in FY 2015 were based on the FY 2014 actual results and FY 2015 YTD, adjusted for changes in rate structure. Future rate revenue projections are based upon FY 2015 estimated results, adjusted annually to reflect assumed rate increases and customer growth.

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Schedule 9 – Capital Projects Funding Sources

CIP Funding Sources:	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Water Development Fees	\$ -	850,000	927,000	477,450	546,500	1,351,200	735,590	-	-	-	-
Sewer Development Fees	-	687,500	-	-	-	-	1,043,100	-	-	-	-
Renewal & Replacement	3,563,604	2,405,722	2,501,057	2,528,224	2,604,051	2,730,487	2,829,472	2,871,234	2,944,908	2,947,301	2,949,638
Revenue Fund	6,082,059	1,031,806	-	-	-	-	-	-	3,172,479	3,134,856	2,151,192
Debt Proceeds	-	1,152,972	3,105,748	2,845,741	13,399,655	3,066,161	4,084,918	6,883,507	4,380,737	5,497,047	5,258,894
Projects Designated To Be Paid With Cash	-	-	-	-	-	-	-	-	-	-	-
Total CIP Funding Sources	\$9,645,663	6,128,000	6,533,805	5,851,415	16,550,206	7,147,848	8,693,080	9,754,741	10,498,124	11,579,204	10,359,725
Total CIP Input	9,645,663	6,128,000	6,533,805	5,851,415	16,550,206	7,147,848	8,693,080	9,754,741	10,498,124	11,579,204	10,359,725
Variance	\$ -	-	-	-	-	-	-	-	-	-	-

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Schedule 10 – Projection of Long-Term Borrowing

		<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
Term (Years)		25	25	25	25	25	25	25	25	25	25	25
Interest Rate		3.50%	3.75%	4.00%	4.25%	4.50%	4.75%	5.00%	5.00%	5.00%	5.00%	5.00%
<u>Sources of Funds</u>												
Par Amount		\$ -	1,256,414	3,390,599	3,112,530	14,683,572	3,366,393	4,493,624	7,572,219	4,819,041	6,047,040	5,785,060
<u>Uses of Funds</u>												
Proceeds		\$ -	1,152,972	3,105,748	2,845,741	13,399,655	3,066,161	4,084,918	6,883,507	4,380,737	5,497,047	5,258,894
Cost of Issuance	2.00% of Par	-	25,128	67,812	62,251	293,671	67,328	89,872	151,444	96,381	120,941	115,701
Underwriter's Discount	\$0.00 per \$1,000	-	-	-	-	-	-	-	-	-	-	-
Bond Insurance	- times total Debt Service	-	-	-	-	-	-	-	-	-	-	-
Capitalized Interest	0 Years Interest	-	-	-	-	-	-	-	-	-	-	-
Debt Service Surety	0.00% of Debt Service	-	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve	1 Years of Debt Service	-	78,314	217,039	204,538	990,246	232,904	318,834	537,268	341,923	429,052	410,464
Other Costs		-	-	-	-	-	-	-	-	-	-	-
Total Uses		\$ -	1,256,414	3,390,599	3,112,530	14,683,572	3,366,393	4,493,624	7,572,219	4,819,041	6,047,040	5,785,060
1 Year Interest		\$ -	47,116	135,624	132,283	660,761	159,904	224,681	378,611	240,952	302,352	289,253
Annual Debt Service		\$ -	78,314	217,039	204,538	990,246	232,904	318,834	537,268	341,923	429,052	410,464
Total Debt Service		\$ -	1,957,860	5,425,972	5,113,461	24,756,146	5,822,608	7,970,842	13,431,689	8,548,070	10,726,309	10,261,606
Cumulative New Annual Debt Service ⁽¹⁾		\$ -	47,116	213,938	427,636	1,160,652	1,650,041	1,947,723	2,420,486	2,820,095	3,223,418	3,639,371

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

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Schedule 11 – Funding Summary by Fund

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
<u>WATER DEVELOPMENT FEES</u>											
BALANCE AT BEGINNING OF FISCAL YEAR	\$ 2,366,464	2,920,005	2,400,884	1,805,813	1,660,895	1,448,542	424,590	4,246	318,441	638,920	965,808
ADDITIONAL ANNUAL REVENUES	540,357	311,000	311,000	311,000	311,000	311,000	311,000	311,000	311,000	311,000	311,000
LESS: PAYMENT OF DEBT SERVICE	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	\$ 2,906,822	3,231,005	2,711,884	2,116,813	1,971,895	1,759,542	735,590	315,246	629,441	949,920	1,276,808
LESS: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
TOTAL AMOUNT AVAILABLE FOR PROJECTS	\$ 2,906,822	3,231,005	2,711,884	2,116,813	1,971,895	1,759,542	735,590	315,246	629,441	949,920	1,276,808
AMOUNT PAID FOR PROJECTS	-	(850,000)	(927,000)	(477,450)	(546,500)	(1,351,200)	(735,590)	-	-	-	-
SUBTOTAL	\$ 2,906,822	2,381,005	1,784,884	1,639,363	1,425,395	408,342	-	315,246	629,441	949,920	1,276,808
ADD BACK: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
PLUS: INTEREST EARNINGS	13,183	19,879	20,929	21,532	23,147	16,248	4,246	3,195	9,479	15,888	22,426
LESS: INTEREST ALLOCATED TO CASH FLOW	-	-	-	-	-	-	-	-	-	-	-
BALANCE AT END OF FISCAL YEAR	\$ 2,920,005	2,400,884	1,805,813	1,660,895	1,448,542	424,590	4,246	318,441	638,920	965,808	1,299,234
<u>SEWER DEVELOPMENT FEES</u>											
BALANCE AT BEGINNING OF FISCAL YEAR	\$ 2,157,349	2,435,103	2,072,443	2,402,708	2,742,667	3,094,117	3,458,959	2,785,687	3,152,481	3,526,610	3,908,223
ADDITIONAL ANNUAL REVENUES	266,302	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
LESS: PAYMENT OF DEBT SERVICE	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	\$ 2,423,651	2,743,103	2,380,443	2,710,708	3,050,667	3,402,117	3,766,959	3,093,687	3,460,481	3,834,610	4,216,223
LESS: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
TOTAL AMOUNT AVAILABLE FOR PROJECTS	\$ 2,423,651	2,743,103	2,380,443	2,710,708	3,050,667	3,402,117	3,766,959	3,093,687	3,460,481	3,834,610	4,216,223
AMOUNT PAID FOR PROJECTS	-	(687,500)	-	-	-	-	(1,043,100)	-	-	-	-
SUBTOTAL	\$ 2,423,651	2,055,603	2,380,443	2,710,708	3,050,667	3,402,117	2,723,859	3,093,687	3,460,481	3,834,610	4,216,223
ADD BACK: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
PLUS: INTEREST EARNINGS	11,452	16,840	22,264	31,959	43,450	56,842	61,828	58,794	66,130	73,612	81,244
LESS: INTEREST ALLOCATED TO CASH FLOW	-	-	-	-	-	-	-	-	-	-	-
BALANCE AT END OF FISCAL YEAR	\$ 2,435,103	2,072,443	2,402,708	2,742,667	3,094,117	3,458,959	2,785,687	3,152,481	3,526,610	3,908,223	4,297,467
<u>R&R FUND</u>											
BALANCE AT BEGINNING OF FISCAL YEAR	\$ 1,163,604	2,909	11	0	0	0	0	0	0	(0)	0
ADDITIONAL ANNUAL REVENUES	2,400,000	2,402,813	2,501,046	2,528,224	2,604,051	2,730,487	2,829,472	2,871,234	2,944,908	2,947,301	2,949,638
LESS: PAYMENT OF DEBT SERVICE	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	\$ 3,563,604	2,405,722	2,501,057	2,528,224	2,604,051	2,730,487	2,829,472	2,871,234	2,944,908	2,947,301	2,949,638
LESS: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
TOTAL AMOUNT AVAILABLE FOR PROJECTS	\$ 3,563,604	2,405,722	2,501,057	2,528,224	2,604,051	2,730,487	2,829,472	2,871,234	2,944,908	2,947,301	2,949,638
AMOUNT PAID FOR PROJECTS	(3,563,604)	(2,405,722)	(2,501,057)	(2,528,224)	(2,604,051)	(2,730,487)	(2,829,472)	(2,871,234)	(2,944,908)	(2,947,301)	(2,949,638)
SUBTOTAL	\$ -	-	-	-	-	-	-	-	-	(0)	0
ADD BACK: RESTRICTED FUNDS	-	-	-	-	-	-	-	-	-	-	-
PLUS: INTEREST EARNINGS	2,909	11	0	0	0	0	0	0	0	(0)	0
LESS: INTEREST ALLOCATED TO CASH FLOW	-	-	-	-	-	-	-	-	-	-	-
BALANCE AT END OF FISCAL YEAR	\$ 2,909	11	0	0	0	0	0	0	0	(0)	0

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX A

Schedule 11 – Funding Summary by Fund

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>
<u>REVENUE FUND</u>											
BALANCE AT BEGINNING OF FISCAL YEAR	\$11,266,179	4,434,242	3,445,866	3,549,966	3,657,527	3,768,678	3,898,159	4,017,496	4,140,690	4,268,053	4,399,742
ADDITIONAL ANNUAL REVENUES	(749,879)	43,430	104,100	107,561	111,151	129,481	119,338	123,194	3,299,841	3,266,545	2,287,371
LESS: CASH-FUNDED CAPITAL PROJECTS	-	-	-	-	-	-	-	-	-	-	-
LESS: PAYMENT OF DEBT SERVICE	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	\$10,516,300	4,477,672	3,549,966	3,657,527	3,768,678	3,898,159	4,017,496	4,140,690	7,440,532	7,534,599	6,687,114
LESS: RESTRICTED FUNDS	(3,539,156)	(3,445,866)	(3,549,966)	(3,657,527)	(3,768,678)	(3,898,159)	(4,017,496)	(4,140,690)	(4,268,053)	(4,399,742)	(4,535,921)
TOTAL AMOUNT AVAILABLE FOR PROJECTS	\$ 6,977,145	1,031,806	-	-	-	-	-	-	3,172,479	3,134,856	2,151,192
AMOUNT PAID FOR PROJECTS	(6,082,059)	(1,031,806)	-	-	-	-	-	-	(3,172,479)	(3,134,856)	(2,151,192)
SUBTOTAL	\$ 895,086	-	-	-	-	-	-	-	-	-	0
ADD BACK: RESTRICTED FUNDS	3,539,156	3,445,866	3,549,966	3,657,527	3,768,678	3,898,159	4,017,496	4,140,690	4,268,053	4,399,742	4,535,921
PLUS: INTEREST EARNINGS	39,251	29,550	34,979	45,047	55,697	67,085	79,157	81,582	84,087	86,678	89,357
LESS: INTEREST ALLOCATED TO CASH FLOW	(39,251)	(29,550)	(34,979)	(45,047)	(55,697)	(67,085)	(79,157)	(81,582)	(84,087)	(86,678)	(89,357)
BALANCE AT END OF FISCAL YEAR	\$ 4,434,242	3,445,866	3,549,966	3,657,527	3,768,678	3,898,159	4,017,496	4,140,690	4,268,053	4,399,742	4,535,921
<u>RESTRICTED RESERVES</u>											
BALANCE AT BEGINNING OF FISCAL YEAR	\$ 8,200,347	8,200,347	8,278,661	8,495,700	8,700,239	9,690,485	9,923,389	10,242,223	10,779,490	11,121,413	11,550,465
ADDITIONAL FUNDS:	-	-	-	-	-	-	-	-	-	-	-
DEBT SERVICE RESERVE ON NEW DEBT	-	78,314	217,039	204,538	990,246	232,904	318,834	537,268	341,923	429,052	410,464
OTHER ADDITIONAL FUNDS	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	\$ 8,200,347	8,278,661	8,495,700	8,700,239	9,690,485	9,923,389	10,242,223	10,779,490	11,121,413	11,550,465	11,960,930
PLUS: INTEREST EARNINGS	41,002	61,796	83,872	107,475	137,930	171,621	201,656	210,217	219,009	226,719	235,114
LESS: INTEREST ALLOCATED TO CASH FLOW	(41,002)	(61,796)	(83,872)	(107,475)	(137,930)	(171,621)	(201,656)	(210,217)	(219,009)	(226,719)	(235,114)
BALANCE AT END OF FISCAL YEAR	\$ 8,200,347	8,278,661	8,495,700	8,700,239	9,690,485	9,923,389	10,242,223	10,779,490	11,121,413	11,550,465	11,960,930

Appendix B – Supporting Financial Schedules for Cost of Service Analysis

Schedule 1 contains the projections for FY 2016 revenue allocated to Reclaimed Water.

Schedule 2 provides the allocation of expenses between Water, Sewer, and Reclaimed.

Schedule 3 summarizes the results of the cost of service analysis.

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

APPENDIX B

Schedule 1 – FY 2016 Estimated Revenues

ACCT DESCRIPTION	FY 2016 Projection	Water	Sewer	Reclaimed
Water - Base	\$ 4,968,375	4,968,375		
Water - Usage	6,067,895	6,067,895		
Water Energy Adj Charge	-	-		
Hydrant Rental	42,926	42,926		
Sewer - Base	4,322,537		4,322,537	
Sewer - Usage	5,718,287		5,718,287	
Reclaimed Water	1,156,799			1,156,799
Reclaimed Backflow Fee	171,875			171,875
DB Shores Sewer	1,022,334		1,022,334	
SW Serv Ponce Inlet	805,708		805,708	
Sewer Energy Adj Charge	-		-	
Sewer Connect	15,720		15,720	
Reclaimed Water Connect	53,487			53,487
Water Connection	102,000	102,000		
Service Charge	562,520	257,267	273,451	31,802
Misc. Billing Revenue	-	-	-	-
Scrap Sales	-	-	-	-
<u>Intrest Income</u>				
Interest Income	29,550	13,515	14,365	1,671
Interest Income - Restricted	61,796	28,262	30,040	3,494
Reconciling Adj. (Use of Fund Balance)	682,015	311,918	331,540	38,558
Fund Total	\$ 25,783,823	11,792,156	12,533,981	1,457,685

FY 2015 UTILITY FINANCIAL CONDITION ASSESSMENT

Schedule 2 – Service Allocation

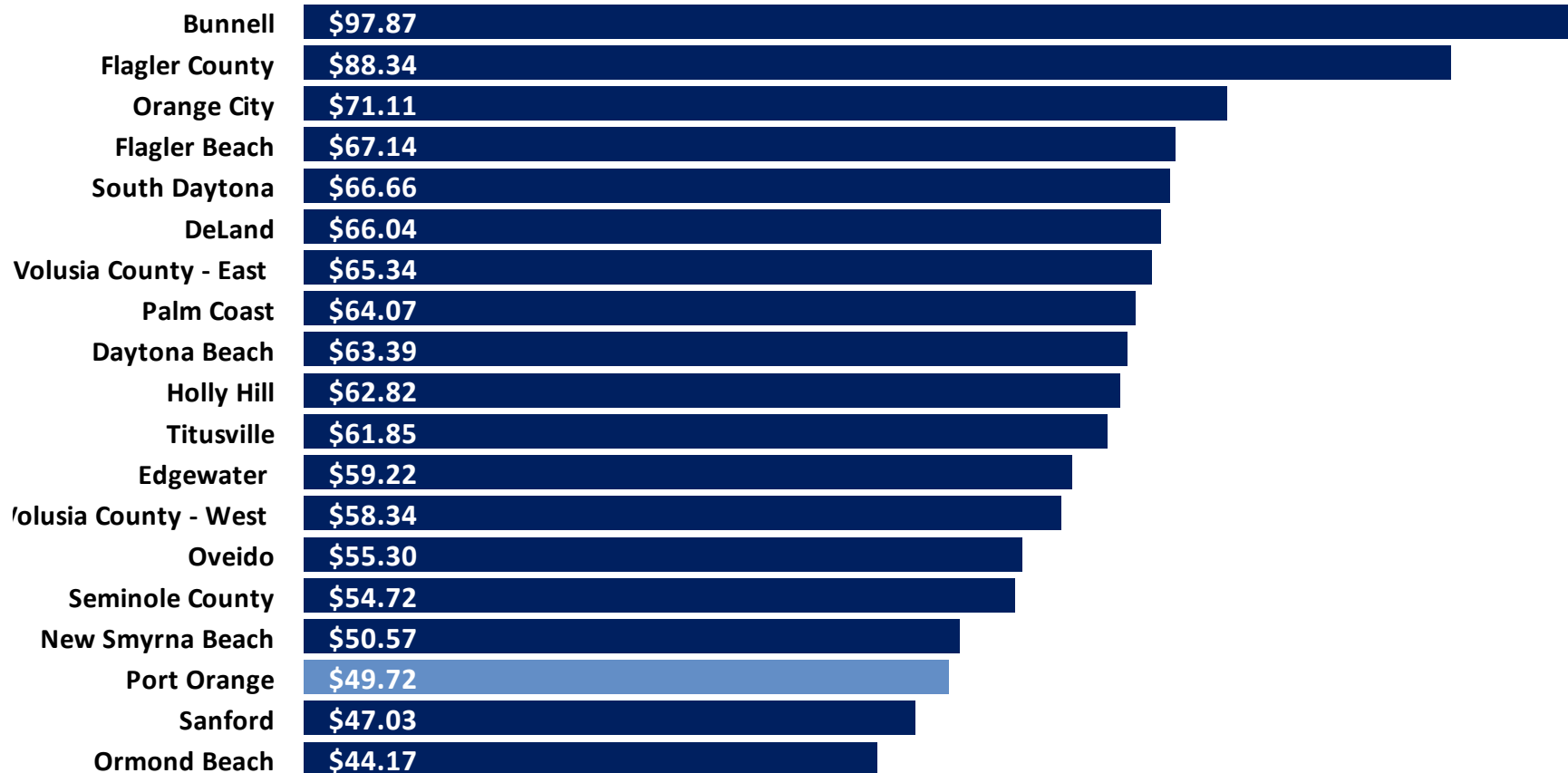
APPENDIX B

	Test Year COS	Allocation Basis/Factor	Water % Allocation	Sewer % Allocation	Reuse % Allocation	N/A	Water \$ Allocation	Sewer \$ Allocation	Reuse \$ Allocation
WATER PLANT - 200	2,276,599	Direct	100.00%	0.00%	0.00%	-	2,276,599	-	-
RECLAIMED PLANT - 400	3,404,316	Estimate	0.00%	90.00%	10.00%	-	-	3,063,884	340,432
METER READING - 500	731,180	Customers	46.60%	41.11%	12.29%	-	340,720	300,596	89,864
MAINTENANCE- 600	1,666,417	10-Year CIP	41.18%	50.65%	8.17%	-	686,221	844,013	136,184
FIELD OPERATIONS- 800	1,721,235	Customers	46.60%	41.11%	12.29%	-	802,073	707,619	211,543
LAB OPERATIONS - 0824	468,662	Flow	39.35%	30.25%	30.40%	-	184,423	141,772	142,467
ADMINISTRATION - 900	1,115,223	Weighted	42.48%	48.65%	8.87%	-	473,759	542,529	98,935
WAREHOUSE - 901	141,075	Weighted	42.48%	48.65%	8.87%	-	59,930	68,630	12,515
NON-DEPARTMENTAL - 300	2,182,313	Weighted	42.48%	48.65%	8.87%	-	927,070	1,061,642	193,601
NON-DEPARTMENTAL - 301	1,225,404	Revenue	45.73%	48.61%	5.65%	-	560,435	595,691	69,278
CUSTOMER SERVICE - 100	905,026	Customers	46.60%	41.11%	12.29%	-	421,730	372,066	111,230
R&R TRANSFER	2,402,813	10-Year CIP	41.18%	50.65%	8.17%	-	989,464	1,216,985	196,364
OTHER TRANSFERS	296,276	Weighted	42.48%	48.65%	8.87%	-	125,861	144,131	26,284
WS 2006	-	Weighted	42.48%	48.65%	8.87%	-	-	-	-
WS 2009	1,189,350	Weighted	42.48%	48.65%	8.87%	-	505,249	578,590	105,511
WS 2011	1,283,415	Weighted	42.48%	48.65%	8.87%	-	545,209	624,350	113,856
WS 2012	2,910,292	Weighted	42.48%	48.65%	8.87%	-	1,236,324	1,415,786	258,182
SRF 3030	295,477	Direct	100.00%	0.00%	0.00%	-	295,477	-	-
SRF 5080	76,797	Direct	0.00%	100.00%	0.00%	-	-	76,797	-
SRF 5090	29,469	Direct	0.00%	100.00%	0.00%	-	-	29,469	-
SRF 513P	914,135	Estimate	0.00%	90.00%	10.00%	-	-	822,721	91,413
SRF 514S	489,369	Direct	0.00%	100.00%	0.00%	-	-	489,369	-
NEW DEBT SERVICE	47,116	FY 16 CIP	59.18%	40.82%	0.00%	-	27,883	19,232	-
INCREMENTAL O&M FOR CIP	11,864	Direct	0.00%	100.00%	0.00%	-	-	11,864	-
TOTAL DEBT SERVICE & TRANSFERS	25,783,823					-	10,458,427	13,127,737	2,197,659
Total Expenditures (exluding Debt, Transfers) \$	15,849,314					\$-	\$ 6,732,960	\$ 7,710,306	\$ 1,406,048
% Allocation						0.0%	42.5%	48.6%	8.9%
Total Expenditures	\$ 25,783,823					\$-	\$ 10,458,427	\$ 13,127,737	\$ 2,197,659
Total % Allocation						0.0%	40.6%	50.9%	8.5%

FY 16 Revenue vs Expenses	Revenues	Revenue %	Expenses	Expense %
Water	\$ 11,792,156	46%	\$ 10,458,427	41%
Sewer	\$ 12,533,981	49%	\$ 13,127,737	51%
Reclaimed	\$ 1,457,685	6%	\$ 2,197,659	9%
Total	\$ 25,783,823	100%	\$ 25,783,823	100%
Historical Investment in Reclaimed System	\$ 30,000,000			
Annual Amortization (40 Year Life)	\$ 750,000			
Full Cost of Reuse System	\$ 2,947,659			
Current Revenue	\$ 1,457,685			
% Cost Recovery	49%			

Appendix C – Combined Water & Sewer Monthly Bill Survey

Schedule 1 presents the FY 2015 monthly combined water and sewer bill survey for “typical” single-family residential customers in the City’s surrounding geographic area, assuming consumption of 4,000 gallons per month

Combined Water & Sewer Bill Survey at 4,000 Gallons per Month

City of Port Orange Water Audit

		From	Nov-14
		To	Oct-15
Line	Item	Units	
	<u>TREATMENT SYSTEM</u>		
1A	Raw water produced	Gallons	179,626,068
1B	finished water purchased	Gallons	60,790
1C	Total water produced and purchased (1A+1B)	Gallons	179,686,857
1D	unmetered but known uses in treatment	Gallons	1,332,000
1E	Total water produced and purchased for distribution (1C-1D)	Gallons	178,354,857
1F	Metered finished water entering the distribution system	Gallons	180,488,568
1G	Total water unaccounted for in treatment process (1E-1F)	Gallons	(2,133,711)
	<u>METERED USE</u>	Gallons	
2A	Small and medium meter use (5/8 inch - 2 inched	Gallons	108,295,000
2B	Large meter use (greater than 2 inches)	Gallons	38,397,333
2C	Sum of lines (2A-2B)	Gallons	146,692,333
	<u>DISTRIBUTION SYSTEM</u>	Documented/ Estimated/ Billed (Gallons)	
3A	Irrigation (SP meter)	Billed	6,875,583
3B	Hydrant Maintenance	Estimated	-
3C	Water quality flushing	Documented	4,653,750
3D	Firefighting	Documented	-
3E	Main breaks	Estimated	-
3F	Known line losses (Private Water System)	Estimated	622,266
3G	Total (Sum 3A to 3F)		12,151,599
	<u>SUMMARY OF WATER USE</u>		
4A	Total water from distribution system (2C+3G)	Gallons	158,843,933
4B	Total water produced and purchased for Distribution (1E)	Gallons	178,354,857
4C	Total unaccounted for water loss from distribution (4B-4A)	Gallons	19,510,924
4E	Percent total unaccounted for loss from treatment and distribution systems (4C/4B)*100	%	10.94
	NOTES		



Water Audit/Meter Replacement Program/Revenues

Public Utilities & Finance Departments

Andrew Neff & Tracey Riehm

November 17, 2015



Purpose / Agenda

- **Purpose:** Provide information on water use/losses, status of the meter replacement program and system revenues.
- **Agenda:**
 - Background
 - Water Audit (water loss calculation)
 - Observations
 - Revenue Discussion
 - Recommendations

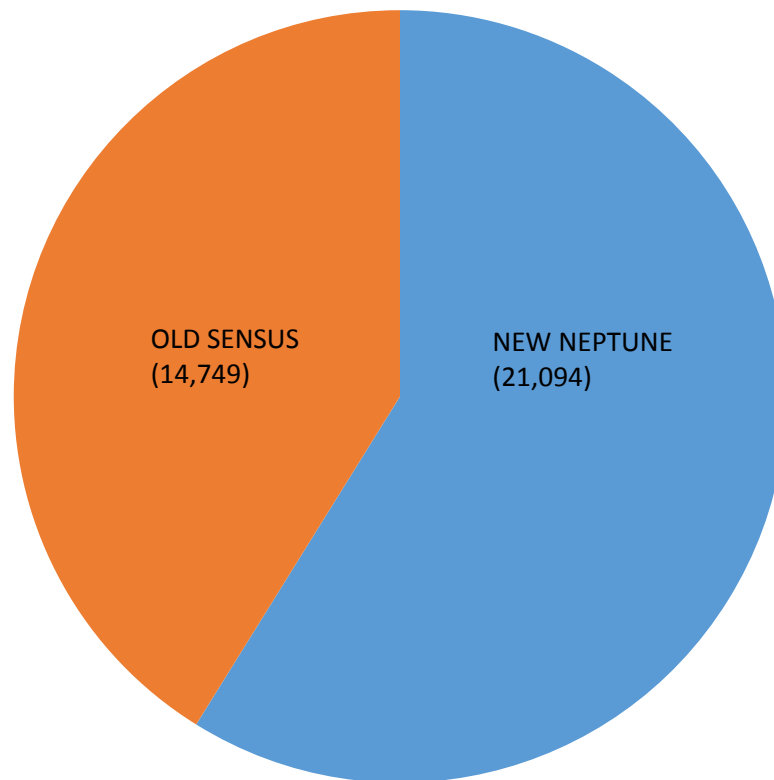


Background

- 2013: Meter replacement program began--New Neptune are replacing old Sensus meters.
- Purpose: To ensure billing accuracy, improve accountability of water use, better understand the extent of unaccounted for water in the system and create an increased awareness of water use for the customer improving conservation.
- The City has approx. 35,843 meters. This program targets replacement of 4500 meters annually.
- In FY15, the City replaced over 5900 meters.



Meter Replacement Program





Background

Burton & Associates Report, August 26, 2015

Observations:

Increased consumption offset by changes in:

- Weather (more recent wet weather patterns)
- Reductions in use due to price signals
- Changes in behaviors due to greater understanding of conservation and more efficient technologies employed

Deltona Experience (FY12-14)

- Lack of aggressive meter replacement program
- Water Demand -7%; Irrigation demand -23%



Water Audit

City of Port Orange Water Audit

		From	Nov-14
		To	Oct-15
Line	Item	Units	
<u>TREATMENT SYSTEM</u>			
1A	Raw water produced	Gallons	179,626,068
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1D	unmetered but known uses in treatment	Gallons	1,332,000
1E	Total water produced and purchased for distribution (1C-1D)	Gallons	178,354,857
1F	Metered finished water entering the distribution system	Gallons	180,488,568
1G	Total water unaccounted for in treatment process (1E-1F)	Gallons	(2,133,711)
<u>METERED USE</u>			
		Gallons	
2A	Small and medium meter use (5/8 inch - 2 inched	Gallons	108,295,000
2B	Large meter use (greater than 2 inches)	Gallons	38,397,333
2C	Sum of lines (2A-2B)	Gallons	146,692,333
<u>DISTRIBUTION SYSTEM</u>			
		Documented/ Estimated/ Billed (Gallons)	
3A	Irrigation (SP meter)	Billed	6,875,583
3B	Hydrant Maintenance	Estimated	-
3C	Water quality flushing	Documented	4,653,750
3D	Firefighting	Documented	-
3E	Main breaks	Estimated	-
3F	Known line losses (Private Water System)	Estimated	622,266
3G	Total (Sum 3A to 3F)		12,151,599
<u>SUMMARY OF WATER USE</u>			
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	<u>TREATMENT SYSTEM</u>		
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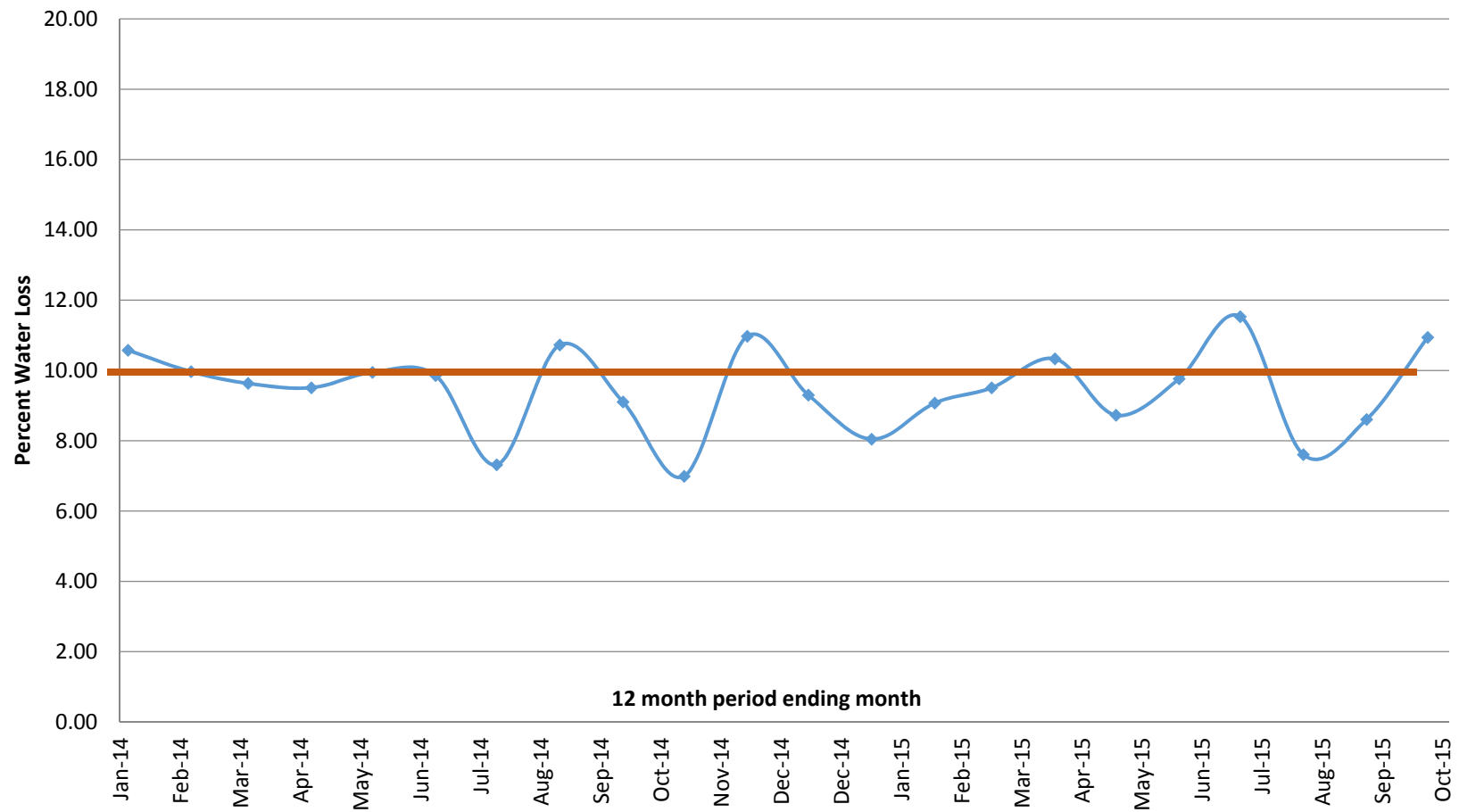
	<u>DISTRIBUTION SYSTEM</u>	Documented/ Estimated/ Billed (Gallons)	
3A	Irrigation (SP meter)	Billed	6,875,583
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3E	Main breaks	Estimated	-
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3G	Total (Sum 3A to 3F)		12,151,599



	<u>SUMMARY OF WATER USE</u>		
4A	Total water from distribution system (2C+3G)	Gallons	158,843,933
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4E	Percent total unaccounted for loss from treatment and distribution systems (4C/4B)*100	%	10.94



Unaccounted For Water Loss % (Rolling 12 Month Average)





Observations

Variables

Increase Revenues:

- Rate Increase

- Dry weather

- More accurate metering

Decrease Revenues:

- Wet weather

- Conservation (including more efficient fixtures)

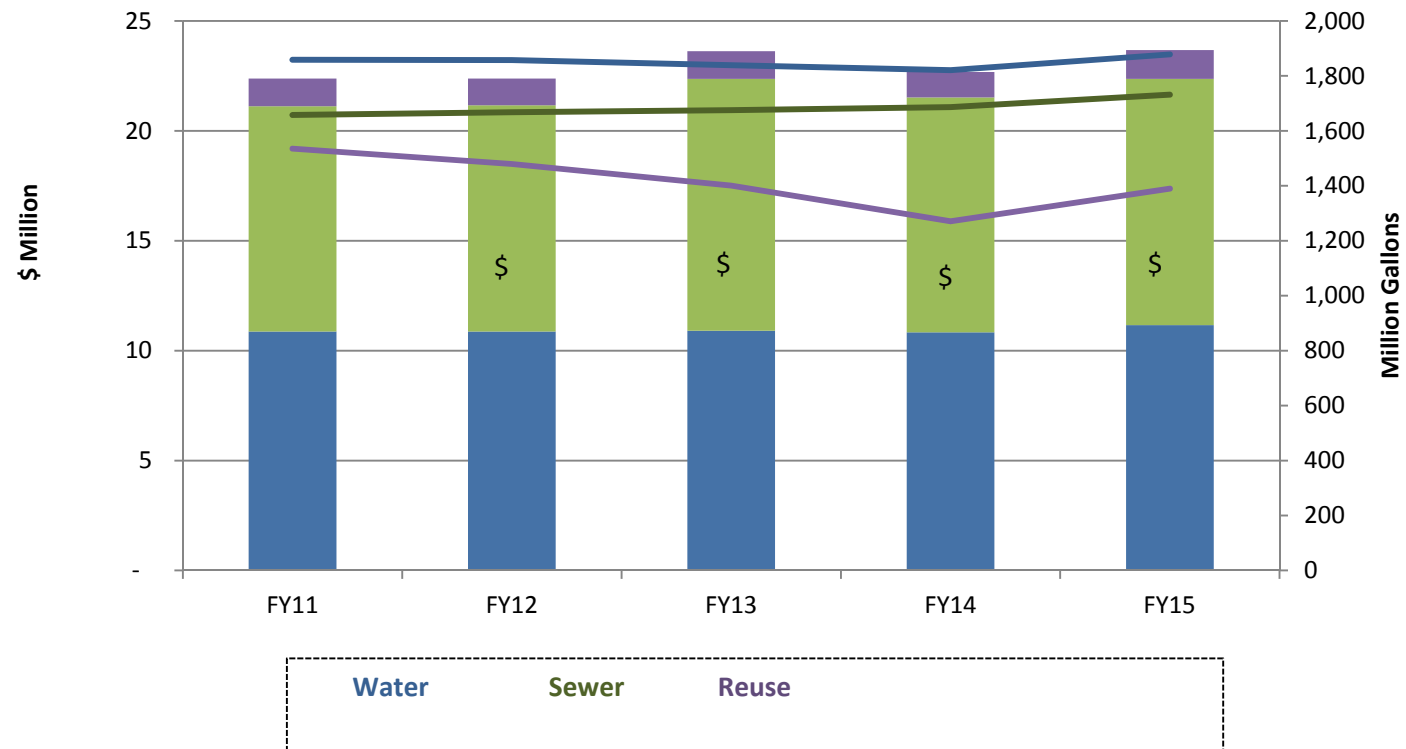
- Elasticity from rate increases/improved metering

Rate Restructuring



Revenue

Historical Metered Revenue & Consumption





Recommendations

Continue with the meter replacement program

Continue to monitor and capture water losses

Monitor revenues and consumption to better determine impacts of the rate increase and restructuring

City of Port Orange Water Audit

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		To	Oct-15
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1E	unmetered but known uses in treatment	Gallons	1,332,000
1F	Total water used in treatment (1D+1E)	Gallons	1,332,000
1G	Total water produced and purchased for distribution (1C-1F)	Gallons	178,354,857
1H	Metered finished water entering the distribution system	Gallons	180,488,568
1I	Change in reservoir and tank storage	Gallons	
1J	Total water unaccounted for in treatment process $([1G-1H]+1I)$	Gallons	(2,133,711)
	<u>METERED USE</u>	Gallons	
2A	Small and medium meter use (5/8 inch - 2 inched	Gallons	108,295,000
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	<u>SUMMARY OF WATER USE</u>		
4A	Total water from distribution system (2C+3G)	Gallons	158,843,933
4B	Total finished water pumped into distribution system (1H)	Gallons	180,488,568
4C	Total unaccounted for water loss from distribution (4B-4A)	Gallons	21,644,636
4D	Total unaccounted for water from treatment and distribution systems (1K+4C)	Gallons	19,510,924
4E	Percent total unaccounted for loss from treatment and distribution systems $(4F/1G)*100$	%	10.94
	NOTES		



Water Audit/Meter Replacement Program

Public Utilities Department

Andrew Neff

November 17, 2015



Purpose / Agenda

- **Purpose:** Provide information on water use and losses and status of the meter replacement program.
- **Agenda:**
 - Background
 - Water Audit (water loss calculation)
 - Observations
 - Recommendations



Background

- 2013: Meter replacement program began--New Neptune are replacing old Sensus meters.
- Purpose: To ensure billing accuracy, improve accountability of water use, better understand the extent of unaccounted for water in the system and create an increased awareness of water use for the customer improving conservation.
- The City has approx. 35,843 meters. This program targets replacement of 4500 meters annually.
- In FY15, the City replaced over 5900 meters.
- Currently: A total of 21,094 new Neptune meters installed and 14,749 old Sensus meters remaining to be replaced.



Burton & Associates Report, August 26, 2015

Observations:

Increased consumption offset by changes in:

- Weather (more recent wet weather patterns)
- Reductions in use due to price signals
- Changes in behaviors due to greater understanding of conservation and more efficient technologies employed

Deltona Experience (FY12-14)

- Lack of aggressive meter replacement program
- Water Demand -7%; Irrigation demand -23%



Water Audit

City of Port Orange Water Audit

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METERED USE			
2A	Small and medium meter use (5/8 inch - 2 inch)	Gallons	108,295,000
2B	Large meter use (greater than 2 inches)	Gallons	38,397,333
2C	Sum of lines (2A-2B)	Gallons	146,692,333
DISTRIBUTION SYSTEM			
		Documented/ Estimated/ Billed (Gallons)	
3A	Irrigation (SP meter)	Billed	6,875,583
3B	Hydrant Maintenance	Estimated	-
3C	Water quality flushing	Documented	4,653,750
3D	Firefighting	Documented	-
3E	Main breaks	Estimated	-
3F	Known line losses (Private Water System)	Estimated	622,266
3G	Total (Sum 3A to 3F)		12,151,599
SUMMARY OF WATER USE			
4A	Total water from distribution system (2C+3G)	Gallons	158,843,933
4B	Total finished water pumped into distribution system (1H)	Gallons	180,488,568
4C	Total unaccounted for water loss from distribution (4B-4A)	Gallons	21,644,636
4D	Total unaccounted for water from treatment and distribution systems (1J+4C)	Gallons	19,510,924
4E	Percent total unaccounted for loss from treatment and distribution systems (4D/1G)*100	%	10.94
NOTES			



	<u>TREATMENT SYSTEM</u>		
1A	Raw water produced	Gallons	179,626,068
1B	finished water purchased	Gallons	60,790
1C	Total water produced and purchased (Sum 1A-1B)	Gallons	179,686,857
1D	Metered uses in treatment	Gallons	
1E	unmetered but known uses in treatment	Gallons	1,332,000
1F	Total water used in treatment (1D+1E)	Gallons	1,332,000
1G	Total water produced and purchased for distribution (1C-1F)	Gallons	178,354,857
1H	Metered finished water entering the distribution system	Gallons	180,488,568
1I	Change in reservoir and tank storage	Gallons	
1J	Total water unaccounted for in treatment process $([1G-1H]+1I)$	Gallons	(2,133,711)



	<u>METERED USE</u>	Gallons	
2A	Small and medium meter use (5/8 inch - 2 inches)	Gallons	108,295,000
2B	Large meter use (greater than 2 inches)	Gallons	38,397,333
2C	Sum of lines (2A-2B)	Gallons	146,692,333

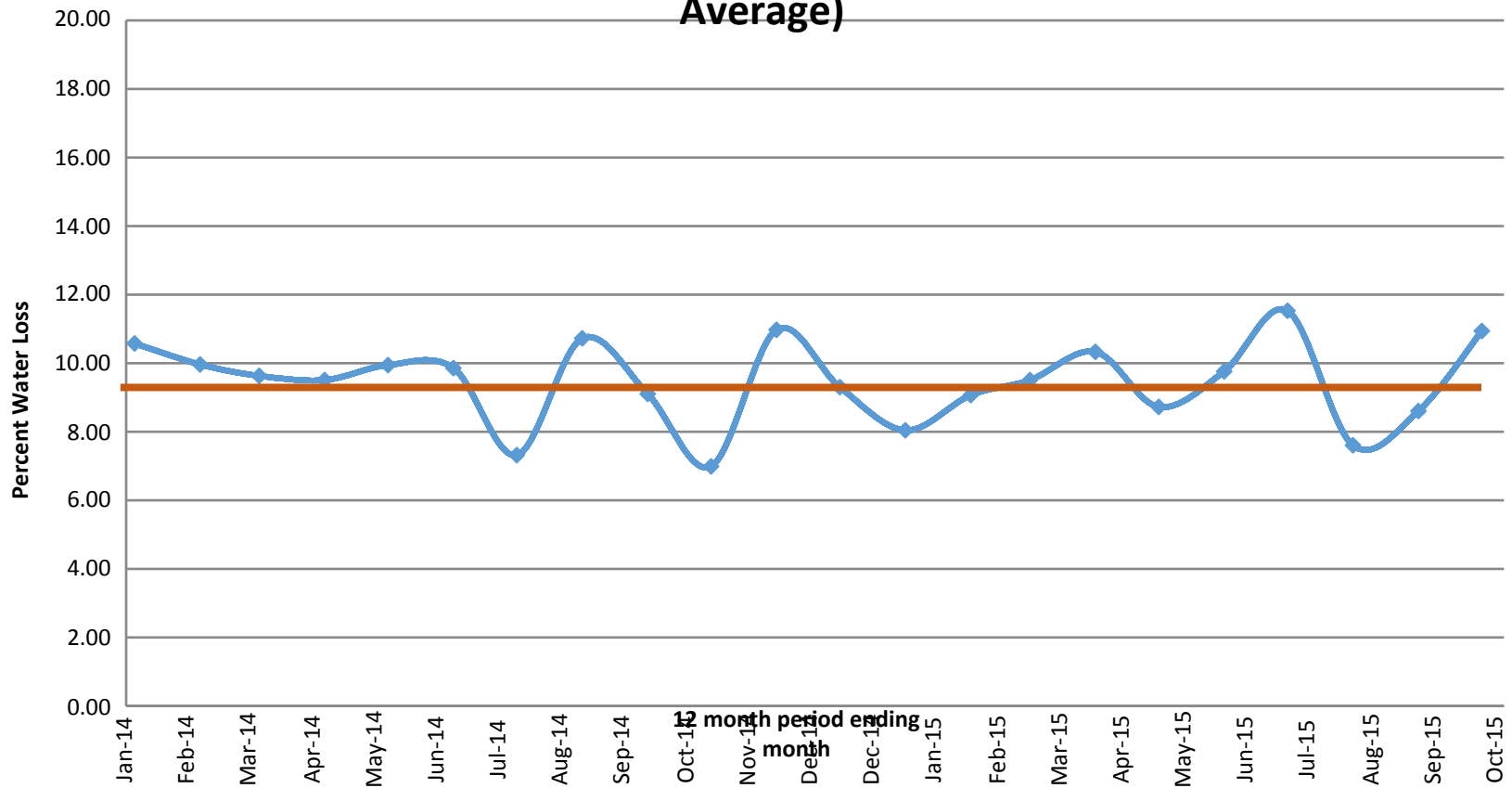
	<u>DISTRIBUTION SYSTEM</u>	Documented/ Estimated/ Billed (Gallons)	
3A	Irrigation (SP meter)	Billed	6,875,583
3B	Hydrant Maintenance	Estimated	-
3C	Water quality flushing	Documented	4,653,750
3D	Firefighting	Documented	-
3E	Main breaks	Estimated	-
3F	Known line losses (Private Water System)	Estimated	622,266
3G	Total (Sum 3A to 3F)		12,151,599



	<u>SUMMARY OF WATER USE</u>		
4A	Total water from distribution system (2C+3G)	Gallons	158,843,933
4B	Total finished water pumped into distribution system (1H)	Gallons	180,488,568
4C	Total unaccounted for water loss from distribution (4B-4A)	Gallons	21,644,636
4D	Total unaccounted for water from treatment and distribution systems (1K+4C)	Gallons	19,510,924
4E	Percent total unaccounted for loss from treatment and distribution systems (4F/1G)*100	%	10.94



Unaccounted For Water Loss % (Rolling 12 Month Average)





Observations

Variables

Increase Revenues:

- Rate Increase

- Dry weather

- More accurate metering

Decrease Revenues:

- Wet weather

- Conservation (including more efficient fixtures)

- Elasticity from rate increases/improved metering

Rate Restructuring



Recommendations

Continue with the meter replacement program

Continue to monitor and capture water losses

Monitor revenues and consumption to better determine impacts of the rate increase and restructuring