CITY OF FLAGSTAFF
WATER COMMISSION
January 17, 2019

SUMMARIZED MINUTES

MEMBERS PRESENT	MEMBERS ABSENT	STAFF PRESENT	OTHERS PRESENT
John Malin	Marie Jones, P&Z Rep	Brad Hill	Robert Vane
Ward Davis	Malcolm Alter	Marion Lee	Bryan Bates
Elizabeth Christy		Erin Young	George Kladnik
Ben Ruddell		Steve Camp	
		Ryan Roberts	
		Chris Kirkendall	

I. CALL TO ORDER

Chair, John Malin called the meeting to order at 4:00 p.m.

II. APPROVAL OF MINUTES – November 15, 2018

Moved by Ward Davis and seconded by Ben Ruddell to approve the meeting minutes of November 15, 2018. Motion carried unanimously.

Chair, John Malin thanked Hanna Cortner and Kira Russo for their services on the Water Commission. Both will not be returning.

III. PUBLIC PARTICIPATION - None

IV. NEW BUSINESS

A. Reclaimed Water Quality – Erin Young

Erin Young, Water Resources Manager presented this item. When concerns made by a citizen and a researcher around antibiotic resistant bacteria (ARB) in the City's reclaimed system arose in 2012, the City Manager formed a panel of experts to discuss the City's reclaimed water quality to determine if using reclaimed water poses a risk to human health. Research conducted by ARB experts from the University of Arizona and Virginia Tech institutions provided results back to the panel, which ultimately concluded that there is no health risk to the Flagstaff community in the continued use of reclaimed water.

Wastewater effluent has been discharged at various locations along the Rio de Flag for over 100 years. The quality of effluent released to the Rio de Flag has evolved over time, from raw sewage up to the 1950's to the addition of Class A+ Reclaimed Water at the Rio de Flag Water Reclamation Plant (WRP) in the 1990's and the upgrade from Class B to Class A+ at the Wildcat Hill WRP in 2009. The other evolution is that of convenience and quality of life; the evolution of chemicals and pharmaceuticals that end up in wastewater influent. While conventional wastewater treatment systems continue to treat and process water to ensure safety from the most basic water quality concerns, conventional plants are designed to dispose of human and industrial effluents without danger to human health or unacceptable

damage to the natural environment. Conventional systems processes are limited when it comes to addressing advanced compounds detected in the part-per-trillion level that are beyond the requirements of aquifer and surface water quality federal and state programs. Upgrades to conventional treatment alone cost significant money. Because of this, only a small percent of utilities in the nation voluntarily address "how clean is clean" for their individual communities. Aside of the possibility of exceptional circumstances, unregulated Compounds of Emerging Concern (CECs), though widely monitored and studied in research and by the EPA, have yet to prove a need for broad brush regulation. The vast majority of treatment systems remain conventional due to the high cost in taking the (voluntary) leap to the next level of water treatment; advanced water treatment or water purification.

While the panel addressed human health, environmental health was not addressed. As Water Services staff discuss options to manage excess reclaimed water as part of a sustainable water supply, several citizens in the community are concerned with the quality of water discharged to the Rio de Flag today. The question is whether unregulated Compounds of Emerging Concern (CECs) and ARBs are enough of an environmental concern for the Flagstaff community, that the community wishes to consider funding options for advanced wastewater treatment technologies in advance of any future regulation. The type of technology employed could either be based on resolving a single set of specific concerns, or the type of technology could be chosen to address a broad suite of unregulated compounds. Another option is to prevent the interaction of CECs, ARBs, and antibiotic resistance genes in the environment all together by only allowing minimal flow to the Rio de Flag when operationally necessary, and recharging 100% of excess reclaimed water to the aquifer through direct injection.

Flagstaff Water Group consist of a group on Engineers and Scientists and Ward Davis, who is part of this group presented a powerpoint presentation on this item. The outline of the presentation is as follows:

- What's been found in the Wastewater?
- What's the biological significance of contaminants?
- The nature of the water regulations
- What are option for dealing with contaminants and reducing risks?

What has been found are areas of concern –

1. EPA's Compounds of Emerging Concern (CEC)
2. EDC (Endocrine Disrupting Compounds) *Endocrine disrupting compounds are those that interfere with hormone systems, potentially causing developmental disorders (including feminizing and masculinizing), birth defect, and cancers.

The Flagstaff Water Group focused on what can be done to reduce the risks and how much it would cost. One study shows the cost:

Reclaimed Water for Aquifer Recharge – The Health cost of EDCS in USA
$340 billion (2.33% of GDP in 2010)

Reclaimed Water Testing:

- Most recent testing – 2015 (7 reclaimed samples)
- Looked for 96 common compounds (common pharmaceuticals, insecticides, herbicides and personal care products).
- List contained 6 CECs – 2 of them found.
- 6 EDCs found
- 35 to 42 compounds found in the samples.
- 62 individual compounds were found
- 25 compounds were found in EVERY reclaimed sample.

The Biological significance of contaminants:

- Natural supersedes human chemical regulation
- Human regs by concentration; nature function by timing
- Break synthetics may increase toxicity

Bryan Bates, also part of the Flagstaff Water Group added these compounds can often interrupt the reproductive system and cause defects. Studies show was the cause in amphibians.

Reclaimed Water for Aquifer Recharge

- DPR regulations will apply to Reclaimed Water to make it potable (State Regs)
- IPR is controlled by State Regs, but Federal Regs for drinking it.
  -The Contamination is lost in the regs.

The solution:

- Do nothing now: Clean it when used = $$$$$
- Do nothing now: Pay medical bill later = $$$$$
- Install State-of-the Art Cleanup now: Remove 99% of remaining contaminants = 1.7 x reverse osmosis
- Install current best practice: Reverse osmosis = $100 – 140 Million
- Install Advanced Oxidation: UV & Chemicals = $60 – 90 Million
- Install Arvia: Electrical Destruction of Compounds = $3 - $20 Million

The Flagstaff Water Group found the higher the removal, the higher the costs. They are looking at Arvia which uses a carbon bed to absorb the chemicals onto the surface, and uses an electric current through the bed to zap the chemicals into mainly CO2 and water.

Ward concluded:

- Clean up the reclaimed water before putting to the aquifer.
- Test new technologies to do this because existing technologies are too expensive
- Engage in dialogue with community and City Council

Ben Ruddell commented that this is a failure of the Federal Government. The Federal Government and Environmental Protection Agency should give an authoritative useful scientific advice on this because it is not the City's battle to fight this.

Brad Hill said staff is engaged in planning efforts with Carollo Engineering on the bio solids. This is the next step of the treatment process needed in the expansion of the Wildcat Hill Wastewater Treatment Plant. To embark on reclaimed water and the Master planning, the City of Flagstaff has partnered with University of Arizona, Virginia Tech and Arizona State University. Done an inside and outside costs of advance treatment of both plants and outside costs which is the next presentation given by Steve Camp.

B. Advance Treatment Pilot Testing Grant Proposal – Steve Camp

The Arizona Department of Environmental Quality (ADEQ recently made a rule change in January, 2018, to allow direct potable reuse of reclaimed water thru an advanced treatment process. The Water Services Division conducted an Advanced Treatment feasibility study to look at cost and location options of an "inside the fence" approach to construct a treatment plant to purify reclaimed or recycled water into potable drinking water. The findings of the study were presented to the Water Commission and City Council. Brown and Caldwell (B&C), the consultant that conducted the study, recently put together a proposal to pilot test an advanced treatment system to allow the City to an opportunity to conduct testing on advanced treatment alternatives.

B&C developed and presented to Water Services a proposal to pilot test advanced treatment strategies that include the option of treating anywhere from 0 to 100% of the treated water thru a reverse osmosis treatment unit. Salinity is a big taste concern with advanced treated reclaim water. Reverse osmosis is the most effective method to remove salinity, but it come at a great cost. The ability to "fine tune" the cost and taste is a unique opportunity.

The pilot test will run for 4 months and the system will be capable of treating up to 20 gallons per minute. Equipment will be leased during the pilot study. Once Flagstaff has completed its 4-month study, the equipment will likely move to another municipality.

The majority of the funding for the project comes from a grant from the US Department of Reclamation. Funds to meet the 75% match grant requirement come from "In-Kind Contributions". B&C has approached ADEQ, Evoqua Water Technologies, Eurofins Environmental Testing Laboratories, and Walsh Construction for the majority of the matching "In-Kind Contributions". If Flagstaff partners with one other municipality each partner will be required to provide a "In-Kind Contributions" equaling approximately $82,000. These contributions for Flagstaff Water Services consist of lab services and chemicals. Since Flagstaff's lab is not set up to conduct much of these analyses, much of the $82,000 will be a hard cost.

Benefits:

- Able to pilot test DPR without large capital outlay
- First to submit an advance treatment application to ADEQ
- Leading edge of Direct Potable Reuse

ADEQ has been actively seeking a submittal of an advanced treatment process proposal for direct potable reuse since the January 2018 rule change. This is a unique opportunity for Flagstaff Water Services to be one of the first water utilities to participate in a pilot study of using reclaimed water for direct potable reuse.

C. FY 20 Capital Improvement Program – Ryan Roberts

Every year the Water Services Division updates the Capital Improvements Plan. Engineering staff presented this information to the Water Commission. At the February meeting staff will ask for the commission approval prior to it being delivered to City Council during the budget process in April 2019.

Projects are selected based on need. Need includes regulatory requirements, capacity, maintenance, and anticipated growth. The CIP requires changes during the year based on management directives.

Table 1 Water Services Capital Improvement Program 2020 Summary			
ACCT#	Description	FY2020	
202-08-370-3156-0-4463	Rio De Flag Waterline Relocations $4M Bond=$400K annual	$	400,000
202-08-370-3157-0-4463	Annual Water Line Replacement Program	$	-
202-08-370-3165-0-4461	Water Vault and Compound Meter Annual Improvements	$	150,000
202-08-370-3170-0-4461	Annual Radio Read Meter Replacement	$	400,000
202-08-370-3177-0-4421	Water Reserve for Improvements	$	300,000
202-08-370-3372-0-4421	LMWTP Sedimentation Basins $3M Bond=$260K annual	$	260,000
202-08-370-3408-0-4431	Lake Mary Land Acquisition	$	1,200,000
202-08-370-3427-0-4463	Switzer Canyon Transmission Line Ph 4	$	1,740,000
202-08-370-3429-0-4463	Fort Tuthill Waterline Loop	$	2,000,000
202-08-370-3430-0-4421	Water Efficiency Upgrades	$	100,000
202-08-370-3434-0-4463	Fir Avenue WL Replacement	$	800,000
202-08-370-3435-0-4421	Summit and Spring St WL Replacement	$	1,350,000
202-08-370-3436-0-4463	Milton WL Replacement	$	400,000
202-08-370-3437-0-4463	Phoenix Ave Culvert Bridge WL Replacement	$	150,000
202-08-370-3439-0-4421	Water Resources Master Plan	$	150,000
203-08-375-3286-0-4463	Rio De Flag Sewer line Relocations $4M Bond=$400K annual	$	400,000
203-08-375-3220-0-4421	Annual Sewerline Replacement Program	$	-
203-08-375-3235-0-4421	Sewer Reserve for Improvements	$	300,000
203-08-375-3366-0-4466	Wildcat Gas Conveyance System Improvements	$	150,000
203-08-375-3411-0-4421	Wildcat Third Digester Design only	$	700,000
203-08-375-3412-0-4463	Fort Tuthill Sewer Oversizing Reimbursement	$	760,000
203-08-375-3417-0-4463	Westside Interceptor Improvements Phase 2 Thompson Kaibab	$	900,000
203-08-375-3440-0-4463	First Avenue Rte 66 Sewer Replacement-Spruce Ave Wash	$	340,000
203-08-375-3442-0-4463	RDFWRP Concrete Degradation	$	500,000
203-08-375-3443-0-4421	WHWRP Primary Pump Station Design Improvements	$	100,000
203-08-375-3444-0-4421	WHWRP Expansion Design - Conceptual Design	$	250,000
204-08-380-3381-0-4421	RW System Improvements 8" Bottleneck-Design Portion	$	100,000
206-08-385-3238-0-4421	Spot Drainage Improvements	$	75,000
206-08-385-3238-0-4421	Phoenix Ave Culvert Construction	$	650,000
206-08-385-3238-0-4421	Wildwood Drainage Project	$	400,000
206-08-385-3238-0-4421	Rio De Flag Project	$	520,000
	TOTAL	$	15,545,000
	Water	$	9,400,000
	Wastewater	$	4,000,000
	Reclaim	$	100,000
	Stormwater	$	1,645,000
			$15,145,000

Ryan is looking for a recommendation from the Water Commission to forward to Council next month. John Malin asked for a copy of the 5-10 Year CIP plan. Ryan will have this out next month.

V. OLD BUSINESS - None

VI. INFORMATIONAL ITEMS TO/FROM THE CHAIR, COMMISSION OR STAFF

Brad indicated that Water Services Staff is in a 2-step move from City Hall. Staff is currently moving to the new Public Work Building temporarily for several months because the new building on Walgreens is under remodeling and will not be ready until mid-April.

Brad announced he just got word that ASU and Virginia Tech got awarded a Grant for the Water Research Program. To talk about critical evaluation and assessment of the health and environmental risks from antibiotics resistance in reuse and wastewater applications. This is partnership program with other cities.

VII. ADJOURNMENT

John Malin moved to adjourned at 6:08 p.m. and seconded by Elizabeth Christy.