Solids Master Plan Briefing

March 16, 2016

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Solids Master Plan – Team

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Solids Master Plan – Review of Desired Outcomes

- Replacement of aging infrastructure
- Make better use of valuable resources
- Project phasing to maintain reasonable utility rates

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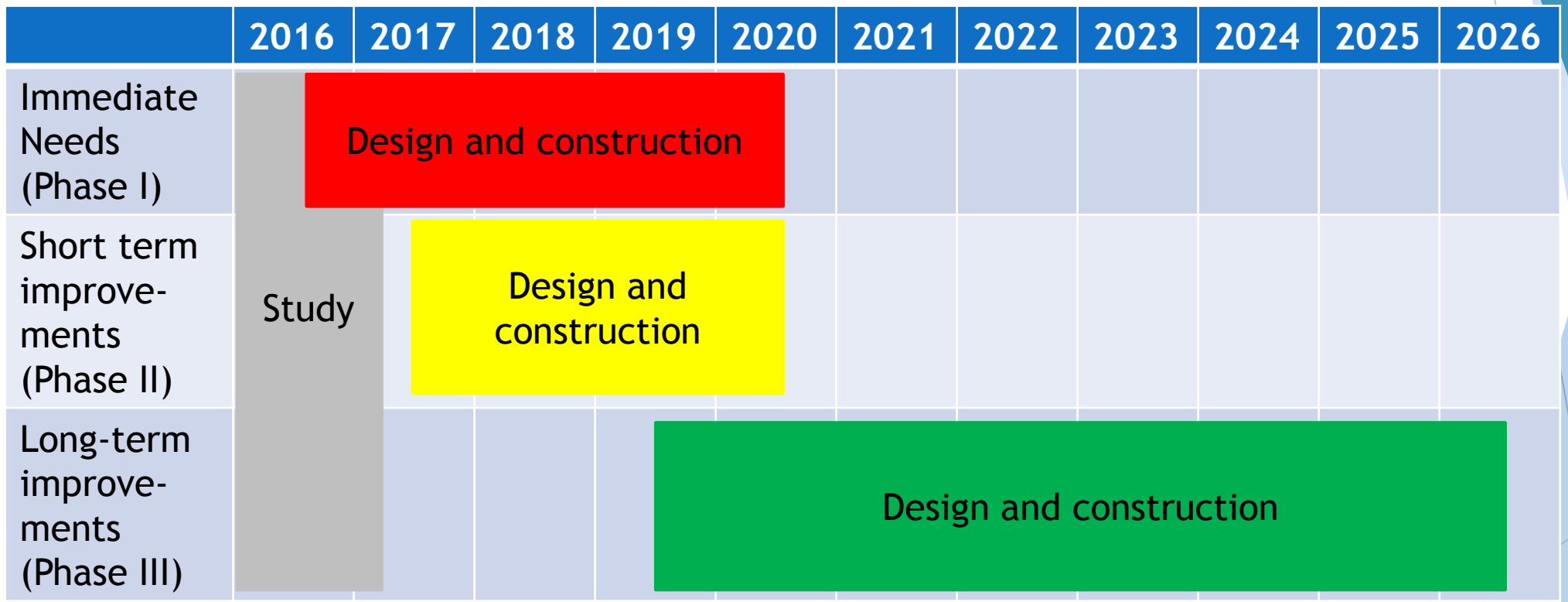
Solids Master Plan – Timeline Review



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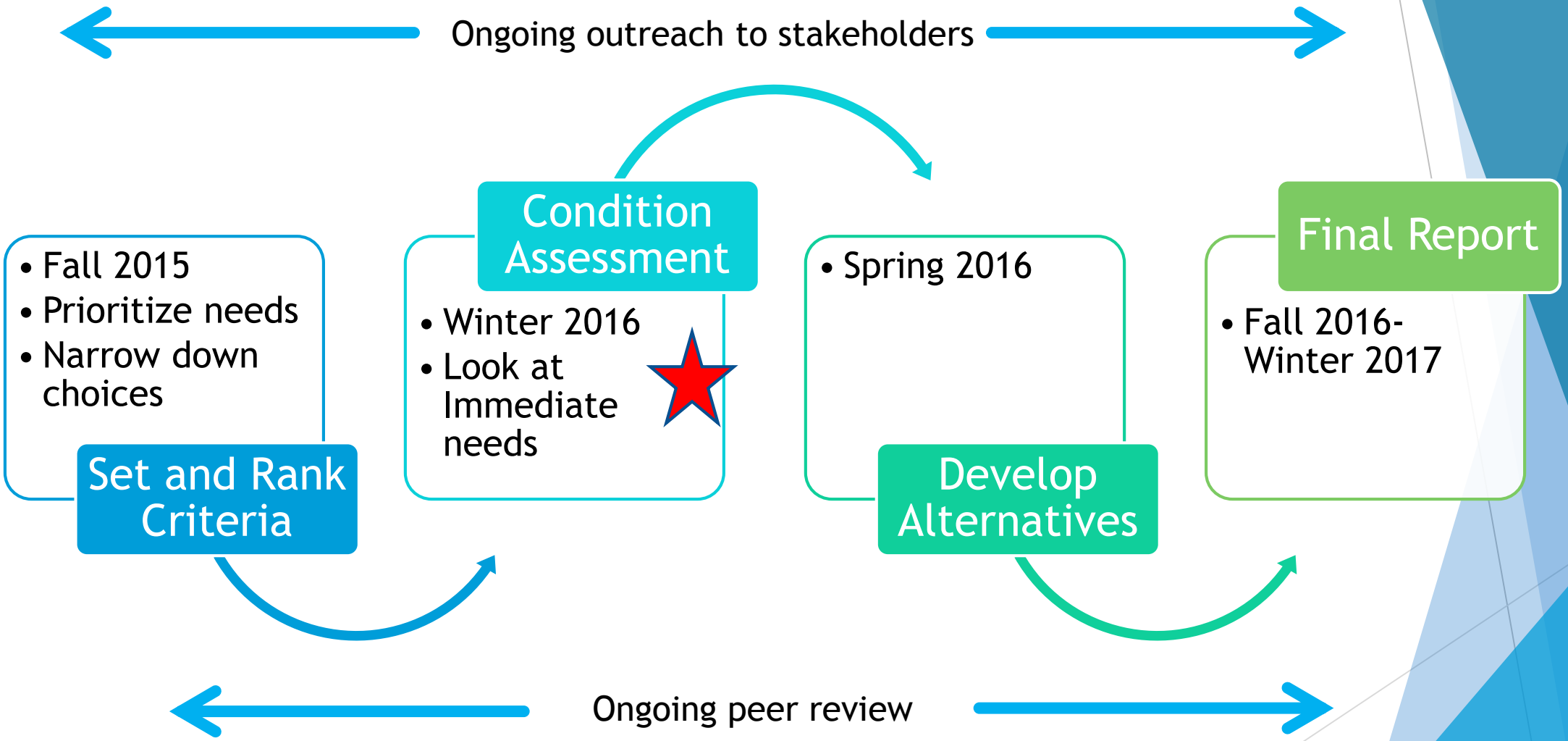
Solids Master Plan – Project Milestones



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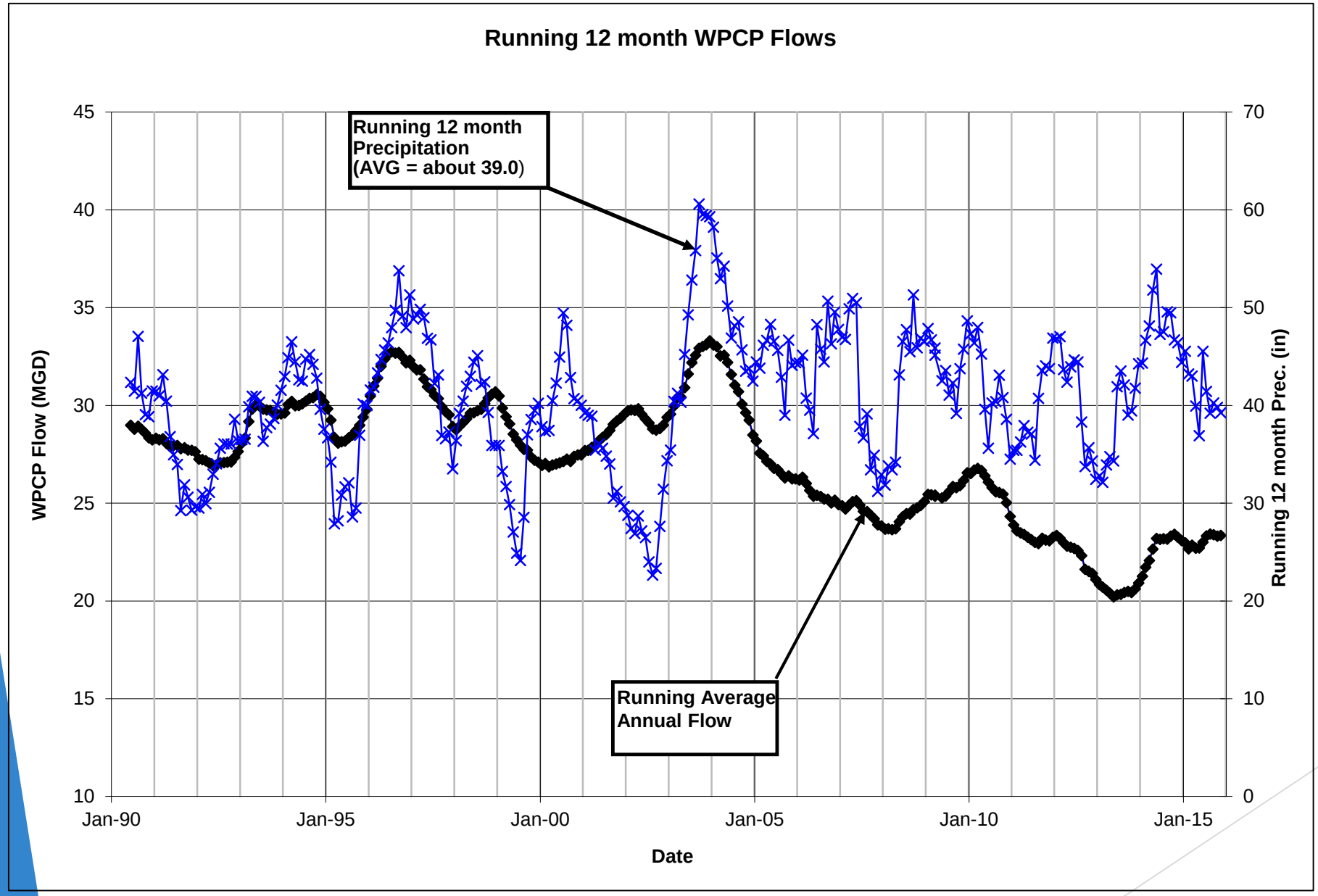
Today's Meeting Agenda

- WPCP Capacity and Solids Loading
- Plan to Address Immediate Needs
- Regulatory Review of Biosolids
- Communication Update
- Discussion
- Paired Comparison Analysis - Exercise

Plant Capacity--History

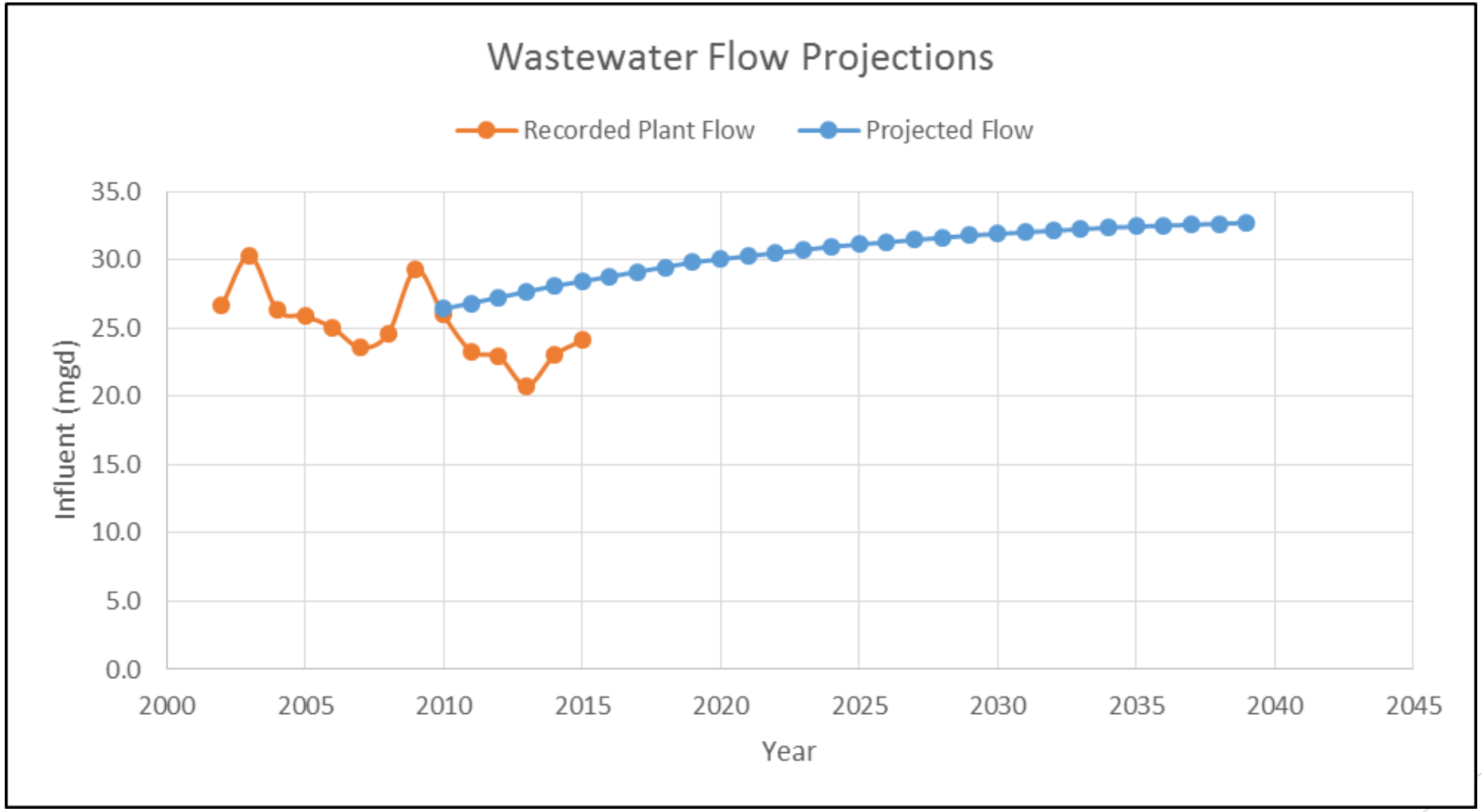


Plant Capacity

- Based on Water Master Plan and Council of Governments population projections
- Includes usage change in Crystal City, reasonable rate of Inflow and Infiltration
- Should have adequate capacity beyond 2040
- Master Plans are done every 10-20 years—will target 2030 for the next one

Year	Sanitary Flow Increase From 2010 (mgd)	Average Annual Plant Flow (mgd)
2010	0	26.0 (actual)
2015	2.09	28.1
2020	3.82	29.8
2025	4.97	30.9
2030	5.79	31.8
2035	6.37	32.3
2040	6.72	32.7

Plant Capacity



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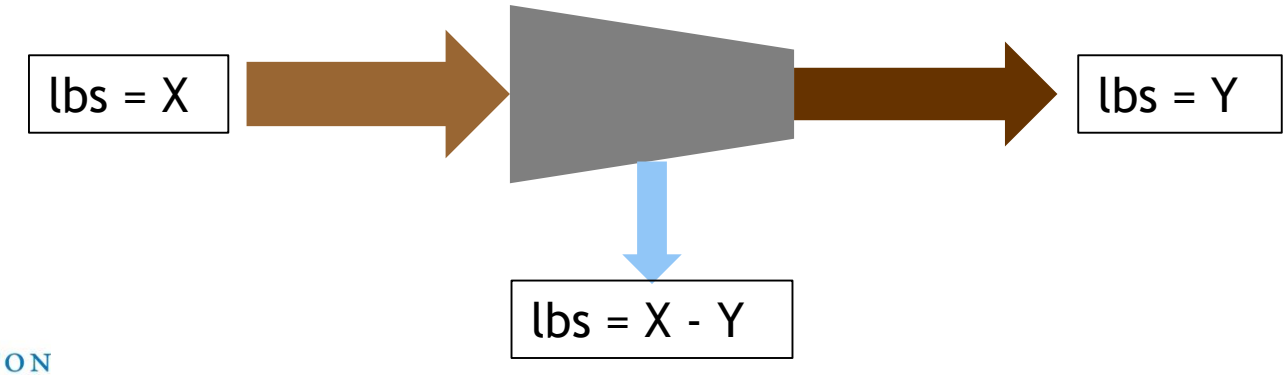
Solids Side Loading

- Solids side loading projections based on concentration of pollutants in influent
- Design of new solids processes will be based on current concentrations and projected flows
- Mass balance being performed on alternative technologies
  - (Mass balance: loadings into a process must equal loadings out)



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Solids Side Loading

- Influent loadings of readily biodegradable carbon (BOD) and suspended solids are used as basis for sizing
- Generally using max month value for design

Year	Projected Annual Average Flow (mgd)	Influent BOD (lb/day)		Influent TSS (lb/day)	
		Annual Average	Maximum Month	Annual Average	Maximum Month
2015	28.1	78,300	111,700	59,800	95,500
2020	29.8	83,000	118,400	63,400	101,200
2040	32.7	91,100	130,000	69,500	111,000
Design Capacity	40	111,400	159,000	85,100	135,900

Plan to Address Immediate Needs

- Five *Immediate Needs* projects identified:
  - Gravity Thickeners
  - Bar Screens
  - Primary Scum Collection
  - Motor Control Center in Preliminary Treatment Building
  - Scum Concentrator

- Equipment is old and condition is fair to poor; failure could have consequences beyond the process itself

Plan to Address Immediate Needs

- Condition assessment; alternatives analysis complete
- Draft business cases have been developed
- Conceptual design is next step
- Design engineer procurement has not yet started

Biosolids Regulations

- USEPA 40 CFR Part 503 Standards for the use and disposal of sewage sludge (1993)
  - Pollutants
  - Pathogens
  - Nutrients
- VA Biosolids Use Regulations
  - VA Dept of Health -1993
  - VA Dept of Environmental Quality (DEQ) -2008
- Local Governments
  - Ordinances

Types of Biosolids

- **Class A** – Exceptional Quality treated to levels that virtually eliminates disease-causing organisms/pathogens, low in heavy metals, and no distribution restrictions

- **Class B** – Less restrictive standards for content of metals and disease causing organisms and require more limitations/restrictions on use and distribution

- **Both Class A and Class B** – Protect human health and the environment

Biosolids Treatment

- Prevents Risk of Disease Infection

- Treatment includes high temp, pressure and pH to kill
  - Bacteria
  - Viruses
  - Parasites

- Processes include
  - Digestion
  - Lime Stabilization
  - Composting
  - Heat Treatment

Risk Based Regulation of Pollutants

- Clean Water Act, Section 405 mandated risk-based limits for pollutants “which may adversely affect public health and the environment”
- EPA Part 503 Regulations established Mean Trace Element Concentrations
- Biosolids well below regulated Pollutant Concentration Limit

Biosolids Metal Concentrations (ppm)

ELEMENT	CEILING CONC LIMIT	POLLUTANT CONC LIMIT (Class A Limit)	ARLINGTON BIOSOLIDS CONC - ANNUAL AVE (2015)
Arsenic	75	41	3
Cadmium	85	39	2
Copper	4300	1500	137
Lead	840	300	19
Mercury	57	17	0.5
Molybdenum	75	--	16 (MAX)
Nickel	420	420	9
Selenium	100	100	5
Zinc	7500	2800	363

Nutrient Management Plans

- Biosolids applied to land must also comply with all regulatory agronomic requirements such as Nutrient Management Plans (NMPs)
- NMPs regulated at State level – Virginia Department of Conservation and Recreation (DCR)
- Marketed Products/Brands require registration with Virginia Department of Agriculture and Consumer Services (VDACS)

Biosolids Regulations: What's Changing?

- No Changes to Federal Regulations expected
- Changes to State Regulations with respect to nutrient management are already taking place
- It is likely that additional nutrient reduction strategies may be incorporated as promotion of complete restoration of the Chesapeake Bay by 2025 takes hold

Biosolids Regulations: What's Changing?

- The seasonal window to land apply biosolids is shrinking
- On-site land application and management costs are on the rise
- Nutrient and energy recovery could help reduce quantities of solids applied to land and reduce nutrients of concern

Communications update

- Website is up: http://projects.arlingtonva.us/projects/water-pollution-control-plant-solids-master-plan/

- Feedback: what's working? What additional resources do we need?

Discussion

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Evaluation Criteria: Exercise

- Evaluation Criteria Goal

Ensures alternative selected best reflects Arlington County's priorities

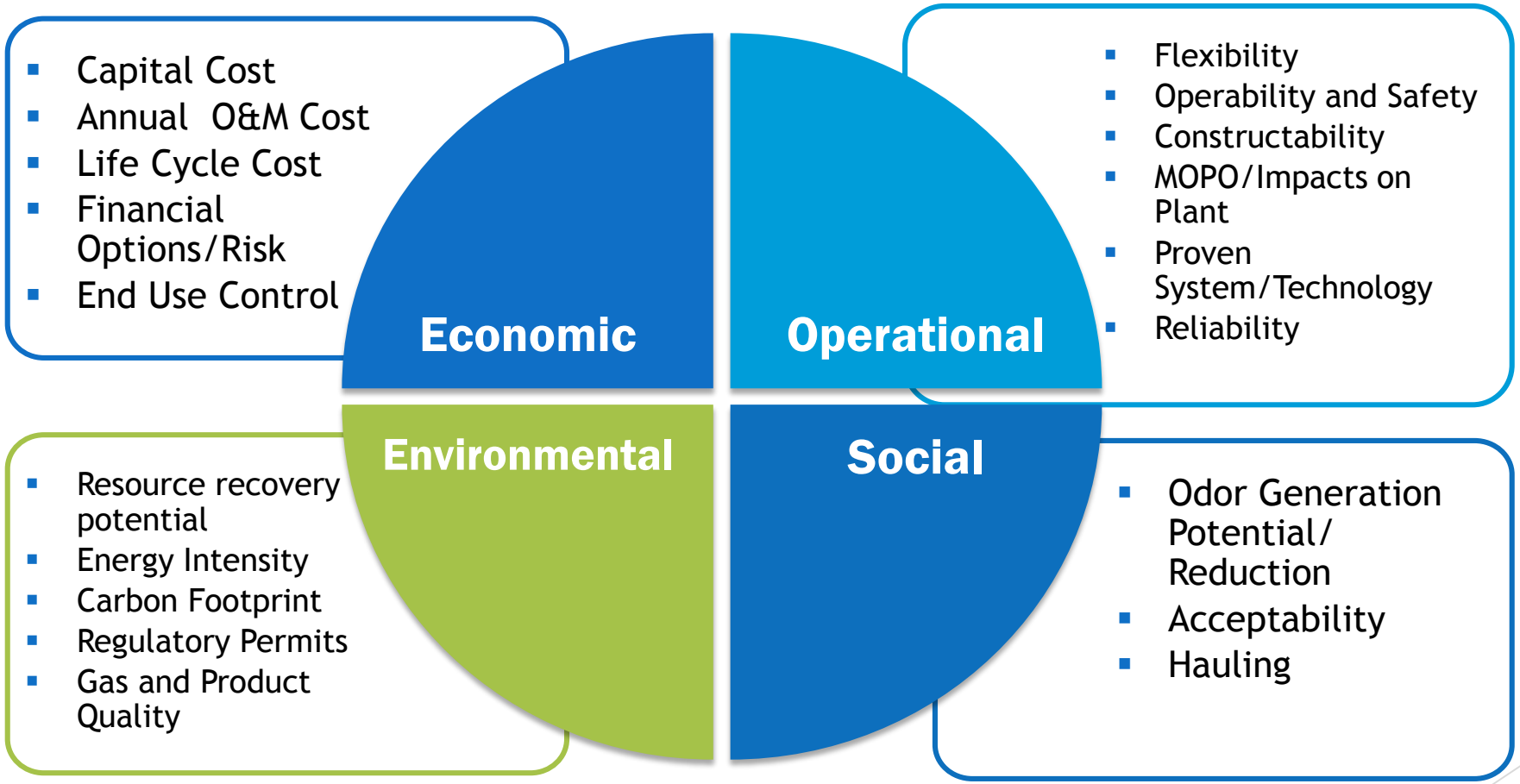
- Paired Metric Comparison

Simple Decision Tool to define the relative importance of a number of different options

Evaluation Criteria: Exercise

- Today's Objectives:
  - Perform Paired Metric Comparison for External Stakeholder Community
  - Integrate Results to reflect Civic Associations and Commissions Input
  - Incorporate Overall input into SMP and discuss any impacts that result

Evaluation Criteria –Grouping Reflects "Quadruple Bottom Line" Approach



Paired Metric Comparison

Rating Scale:

1 - The listed objective is ***slightly higher*** in priority.
2 - The listed objective is ***higher*** in priority.
3 - The listed objective is ***significantly higher*** in priority.

		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
		Capital Cost	Total Annual Cost	Life Cycle Cost	Cost Risk/Liability	End Use Control	Flexibility	Ease of O&M	Proven System/Technology in the US	Reliability	Ability to Construct	Impacts on Plant Processes and Facilities	Product Use/Recycle Potential	Water Impact	Air Impact	Regulatory Permits	Gas and Product Quality	Odor Generation Potential/Reduction	Acceptability	Hauling
Capital Cost	A																			
Total Annual Cost	B																			
Life Cycle Cost	C																			
Cost Risk/Liability	D																			
End Use Control	E																			
Flexibility	F																			
Ease of O&M	G																			
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Acceptability	R																			
Hauling	S																			

Paired Metric Comparison Example

		A Capital Cost	B Operating Cost	C Ease of operations & maintenance
Capital Cost	A		1 A	3 A
Operating Cost	B			2 B
Ease of operations & maintenance	C			

- Capital cost is slightly higher in priority than operating cost.
- Capital cost is significantly higher in priority that ease of operations and maintenance
- Operating cost is higher in priority than ease of operations and maintenance.