Technology Work Group

- Thank You
  - Work Group Members
    - Dale Arnold
    - Bonne Beavers
    - Pat Blau
    - Len Bramble
    - Kathy Cupps
    - Rick Fink
    - Sid Fredrickson
    - Lars Hendron
    - Doug Krapas
    - Joel Massman
    - Mike Petersen
    - Dave Ragsdale (EPA Advisor)
    - Bruce Rawls
    - Terry Werner

Technology Work Group

- Resources
  - Neil Beaver
  - Dave Clark
  - Larry Esvelt
  - Rick Eichstaedt
  - Richard Koch
  - Marcie Mangold
  - Jessica Pilgrim
- Others

Technology Group Activity

- Wastewater Treatment Technologies
- Pilot Wastewater Treatment Facilities

Technology Group Activity

- **Agreed upon 6 Technologies**
- **1** Tertiary Clarification and Granular Media Filtration with Chemical Precipitation
  - US Filter's Trident
  - Kruger's Actiflo
- **2** Sequencing Batch Reactor/Membrane Bioreactor with Enhanced Biological Phosphorus Removal and Chemicals
  - Zenon's ZeeWeed and Cycle-Let
  - Clean Water

- **3** Post Secondary Microfiltration with Chemical Precipitation
  - Zenon's ZeeWeed
  - Kubota
- **4** Two Stage Sand Filtration with Chemical Precipitation (Micromedia Filtration)
  - Parkson's DynaSand
- **5** Post Lime Treatment
- **6** Direct Filtration with Chemical Addition

TMDL Technology Group Progress

- Collected Contacts for the different technologies
- Calling Contacts
- Filling out forms created by the group

Developed a form in which we accumulate <u>general</u> information on treatment facilities within the six treatment technology categories

103 facilities at present

Technology Workgroup Master Matrix								########		Current Flow (MGD)	Lowest P µg/L	Rank	Comments
Tech. #	Description	#	Vendor	Product	Entities to be surveyed	City	ST	Type	NPDES #				
1	Tertiary clarification and granular media filtration with chemical precip.	1	ActiFlo		City of Port Clinton WWTP		OH		OH0052876		170	1	contact made
		2	ActiFlo		Delta Diablo		CA		CA0038547		na	1	contact made
		3	US Filter	Trident	Frisco Sanitation WWTP	Frisco	CO		CO0020451		20	1	contact made
		4	ActiFlo		Greenfield		CA		CO0020451		na	1	contact made
		5	US Filter	Trident	Parker South WWTP	Parker	CO				18	1	contact made
		6	US Filter	Trident	Pinery WWTP	Denver	CO		CO0041092		10	1	contact made
		7	US Filter	Trident	Rock Springs WWTP	Rock Springs	WY		WYG650007		na	1	contact made
		8	US Filter	Trident	Somerset WWTP	Somerset	MA		MA4273000		na	1	contact made
		9	ActiFlo		South Lyon		MI		MI0020273		80	1	contact made
		10	ActiFlo		West Palm Beach		FL		FL0041360		10	1	contact made
		11	ActiFlo		Danbury		OH					2	call back
		12	US Filter	Trident	El Dorado Hills WWTP	El Dorado Hills	CA		CA0078671			2	call back
		13	US Filter	Trident	Ely TTP/WWTP	Ely	MN					2	call back
		14	US Filter	Trident	Stonegate Village WWTP	Parker	CO					2	call back
		15	US Filter	Trident	Trabuco Canyon WWTP	Trabuco Canyon	CA					2	call back
		16	US Filter	Trident	East Plum Creek WWTP	Castle Rock	CO					3	Wrong #
		17	US Filter	Trident	Emerald Green WWTP	Rock Hill	NY					3	Disconnected
		18	US Filter	Trident	Marysville WWTP	Marysville	CA					3	Disconnected
		19	US Filter		Wayne Hill WWTP	Gwinnett Co	GA					4	no contact
		20	ActiFlo		Acheres I	Paris	FR					5	Hold
		21	ActiFlo		Colombier		SZ					5	Hold
		22	ActiFlo		Herford		GM					5	Hold
		23	ActiFlo		Lindsay	Ontario	CN					5	Hold
2	Sequencing Batch Reactor/Membrane Bioreactor with enhanced biological phosphorus removal and chemicals	1	Zenon	ZeeWeed	Bell-Carter Olive Food Pack	Lafayette	CA	Food				2	call back
		2			Cherry Creek Reservoir	Denver	CO					4	no contact
		3	Clean Wtr		Durham WWTP	Hillsboro	OR					4	no contact
		4	Zenon	Cycle-Let	Fern Resort WWTP upgrad	Orillia, Ont.	CN	Resort				4	no contact
		5	Clean Wtr		Hilsboro Westside WWTP	Hillsboro	OR		OR0023345			4	no contact
		6	Clean Wtr		McMinville WWTP		OR					4	no contact
		7	Clean Wtr		Rock Creek WWTP	Hillsboro	OR		OR0029777			4	no contact
		8				Chehalis	WA	WWTP				4	no contact
		9	Zenon	ZeeWeed	Brescia WWTP	Brescia	IT	WWTP				5	Hold
		10	Zenon	ZeeWeed	Landgraaf Landfill (?)	Netherlands	NL					5	Hold
3	Post secondary microfiltration with chemical precip	1	Zenon	ZeeWeed	Lone Tree Creek WWTP	Denver	CO	WTP	CO0040681	1.6	20	1	contact made
		2	Zenon	ZeeWeed	Traverse City WWTP	Traverse	MI	WWTP		7.5	10	1	contact made
		3	Zenon		Utilities INC. of PA Broad R	Chester	VA		PA0043982	0.4		2	call back
		4	Zenon		Creemore	Ontario	CN					4	no contact
		5	Zenon		Fulton County-Cauley Cree	Atlanta	GA		GA003844			4	no contact
		6	Zenon		Gainsville (Linwood Drive	Gainesville	GA		GA0020168			4	no contact
		7	Zenon		Johns Creek MBR & Env. C	Fulton County	GA					4	no contact
		8	Zenon		Manor WRF	Fulton County	GA		GAU090999	2.5		4	no contact
		9	Kubota		Pumpkinvine Creek WRF	Paulding County	GA		GAU020296			4	no contact
		10	Zenon		Rubes Creek WWTP (Rose	Woodstock	GA		GAU020015			4	or GA004645
		11	Kubota		Upper Sweetwater WRF	Paulding County	GA		GAU020004			4	no contact
		12	Kubota		Waterscape Utility Hamptor	Cumming	GA		GAU020293			4	no contact
		13	Zenon		Westbrook Daves Creek, L	Forsyth County	GA		GAU020195	0.25		4	no contact
		14	Zenon			South Shore	CN					4	no contact
		15	Zenon			Port McNicoll	CN					4	no contact
		16	Zenon			Key Colony	FL					4	no contact
		17	Zenon			Lehigh	FL					4	no contact
		18	Zenon			Epping	NH		NH0100691			4	no contact
		19	Zenon			Ashland	OR					4	no contact
4	Two stage sand filtration with chemical precipitation	1	Parkson	DynaSand	Edgewater WWTP	Edgewater	FL	WWTP	FLR10C088	1.2	76	1	contact made
		2	Parkson	DynaSand	Ilderton Senior	Ilderton	CN	WWTP		0.1-0.13	240	1	contact made
		3			Mount Pocono Muni. Auth.	Mount Pocono	PA	WWTP	PA0044997	0.27	760	1	contact made
		4			Oceanside Water Pollution	City of Oceanside	CA	Reuse	CA0037681	16 ADWF	2500	1	contact made
		5			Oceanside WWTP	City of Oceanside	CA	WWTP	CA0107433	10		1	contact made
		6			Pocona County Place WW	Tobyhanna	PA	WWTP	PA0060097	0.6-0.7	326	1	contact made
		7			Rock Hall WTP	Rock Hall	MD	WWTP	MD0020303	0.25	250	1	contact made
		8	Parkson	DynaSand	Rock Hall WTP	Rock Hall	MD	WTP	MD0140006	0.35		1	contact made
		9			Central Marin Sanitation Ag	San Rafael	CA	Reuse	CA0038628	10 ADWF		2	call back
		10			Las Gallinas WWTP	San Rafael	CA	WWTP	CA0037851	2.8	NA	1	contact made
		11	Parkson	DynaSand	Pine Crest Develop.	Pocono Pines	PA		PA0061719			2	call back
		12	Parkson	DynaSand	Salem Township		MI	WWTP				2	call back
		13	Parkson	DynaSand	Trappe WWTP	Town of Trappe	MD	WWTP	MD0020486	0.2		2	call back
		14	Parkson	DynaSand	Villa Julie College	Stevenson	MD		MD0066001	0.05		2	call back
		15			Village of Port Henry	Village of Port He	NY	WTP	NY0022969	0.44	5	2	call back
		16	Parkson	DynaSand	Village of Stamford	Village of Stamfor	NY	WWTP	NY0021555	0.5		2	call back
		17			Village of Trumansburg WW	Trumansburg	NY	Reuse				2	call back
		18	Parkson	DynaSand	Village of Walton	Village of Walton	NY	WWTP	NY0027154	1.17	6	2	call back
		19				Lanai City	HI	Reuse				2	call back
		20				Hartland	MI	WWTP				2	call back
		21	Parkson	DynaSand	Aqueonics/Mahopac	Mahopac	NY		NY0026590	0.3	100	3	Wrong #
		22	Parkson	DynaSand	Casino Rama	Chippewas Natior	CN					4	no contact
		23			City of Glens Falls	City of Glens Falls	NY	WTP	NY0029050			4	no contact
		24	Parkson	DynaSand	City of Innisfil	Innisfil	CN					4	no contact
		25	Parkson	DynaSand	City of Mitchell	Mitchell ON	CN					4	no contact
		26	Parkson	DynaSand	Eastern Correctional	Somerset County	MD		MD0065595	0.0937		4	no contact
		27	Parkson	DynaSand	Elkton WWTP	Elkton	OH					4	no contact
		28	Parkson	DynaSand	Elmvale WWTP	Vill of Elmvale	CN					4	no contact
		29	Parkson	DynaSand	Fleischmanns WWTP	Fleischmanns	NY	WWTP	NY0261521		50	4	no contact
		30	Parkson	DynaSand	Glenmore STP	Glenmore	VA		VA0086584			4	no contact
		31			Hunter WWTP		NY	WWTP	NY0241075			4	no contact
		32	Parkson	DynaSand	Penetanguishene	Penetanguishene	CN					4	no contact
		33	Parkson	DynaSand	Town of Wasaga Beach	Wasaga-Ontario	CN					4	no contact
		34	Parkson	DynaSand	Village of Delhi	Village of Delhi	NY	WWTP	NY0020265			4	no contact
		35			Village of Wilmingon	Village of Wilming	NY	WTP				4	no contact
		36			Watchtower Ed Ctr and Hot	Patterson	NY	WWTP	NY0165778	0.165	200	4	no contact
		37	Parkson	DynaSand	West Gwillimbury WWP	Bradford ON	CN					4	no contact
		38			Windham WWTP	Windham	NY	WWTP	NY0262935	0.375		4	no contact
		39	Parkson	DynaSand		New York	NY	WTP				4	no contact
		40	Parkson	DynaSand				WWTP				4	no contact
5	Post Lime Treatment	1			Upper Occoquan Sewer Au	Centreville	VA	WWTP	VA0024988	30	20	1	contact made
		2			Fred Hervey WRF	El Paso	TX					4	no contact
		3			Oregon treatment Plant	?	OR	WWTP				4	no contact
6	Dir filtr. w/ chem. addtn	1			Medical Lake WWT&WRF	Medical Lake	WA	WWTP				4	no contact
		2			Yelm WWTP	Yelm	WA	WWTP				4	no contact
7	Category To be Determined	1			Arlington County Water Poll	Arlington Co	VA	WWTP	VA0025143			1	contact made
		2			Alexandria Combined Sewe	Alexandria	VA	WWTP	VA0087068			2	call back
		3			Blue Plains AWT	Washington	DC	WWTP	DC0021199			2	call back
		4			PWCSA Mooney WWTP	Woodbridge	VA	WWTP	VA0025101	24	50	2	call back
		5			Clark County WRD	Las Vegas	NV	WWTP	NV0021261			4	no contact
		6			Las Vegas WWTP	Las Vegas	NV	WWTP	NV0020133			4	no contact
		7			Noman M Cole Jr. Pollution	Fairfax Co	VA	WWTP	VA0025364			4	no contact

Tech

Technology Number (1-6): | Variations:

Vendor/Supplier:

Placed in service: / / | Schematic? ☐ Yes ☐ No (if no fill out back)

Follow Up? ☐ Yes ☐ No

Contact Information

Design Firm:
Location (city):
Contact Name:
Contact Telephone: ( )

Current Application
☐ Municipal Wastewater
☐ Industrial Wastewater
☐ Drinking Water
☐ Other:

Facility Name:
Facility Owner:
Location: Street:
City:
State: Zip:
Facility Web Page:
NPDES Permit Number:

Contact Name:
Contact Position:
Contact Telephone: ( )
Contact E-mail:

Performance

Facility Capacity
Design: MGD or GPD (circle)
Current: MGD or GPD (circle)

Is DMR Data Available?
☐ Yes
Date range:
From Who?:
Company Name:
Telephone No.: ( )
☐ No

Pollutant Removal Objectives & Permit Limits:
☐ Phosphorus mg/L or µg/L (circle)
☐ Nitrogen/Ammonia mg/L or µg/L (circle)
☐ BOD mg/L or µg/L (circle)
☐ Other (List below): mg/L or µg/L (circle)
mg/L or µg/L (circle)
mg/L or µg/L (circle)
mg/L or µg/L (circle)
mg/L or µg/L (circle)
mg/L or µg/L (circle)
mg/L or µg/L (circle)

Influent

Influent Phosphorus:
Average: mg/L or µg/L (circle)
Range: *to* mg/L or µg/L (circle)
Where measured?:

Effluent

Effluent Phosphorus:	Daily		Monthly	
median:		mg/L or µg/L (circle)		mg/L or µg/L (circle)
mean:		mg/L or µg/L (circle)		mg/L or µg/L (circle)
best (lowest):		mg/L or µg/L (circle)		mg/L or µg/L (circle)
worst (highest):		mg/L or µg/L (circle)		mg/L or µg/L (circle)

Questions

QUESTIONS:

1. If you had to choose this technology again, what would you do differently?

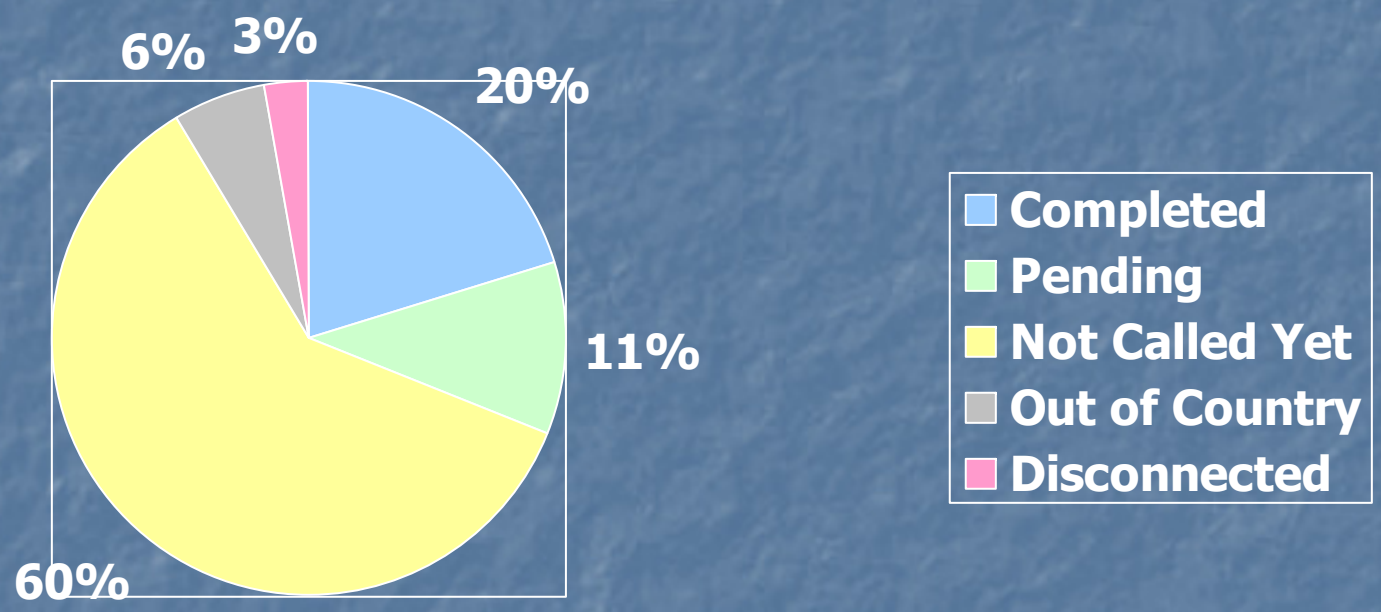
2. Is there a seasonal factor?

3: In what way are the solids handled and disposed of?

This form completed by: *Name:* *Date:* , 2005

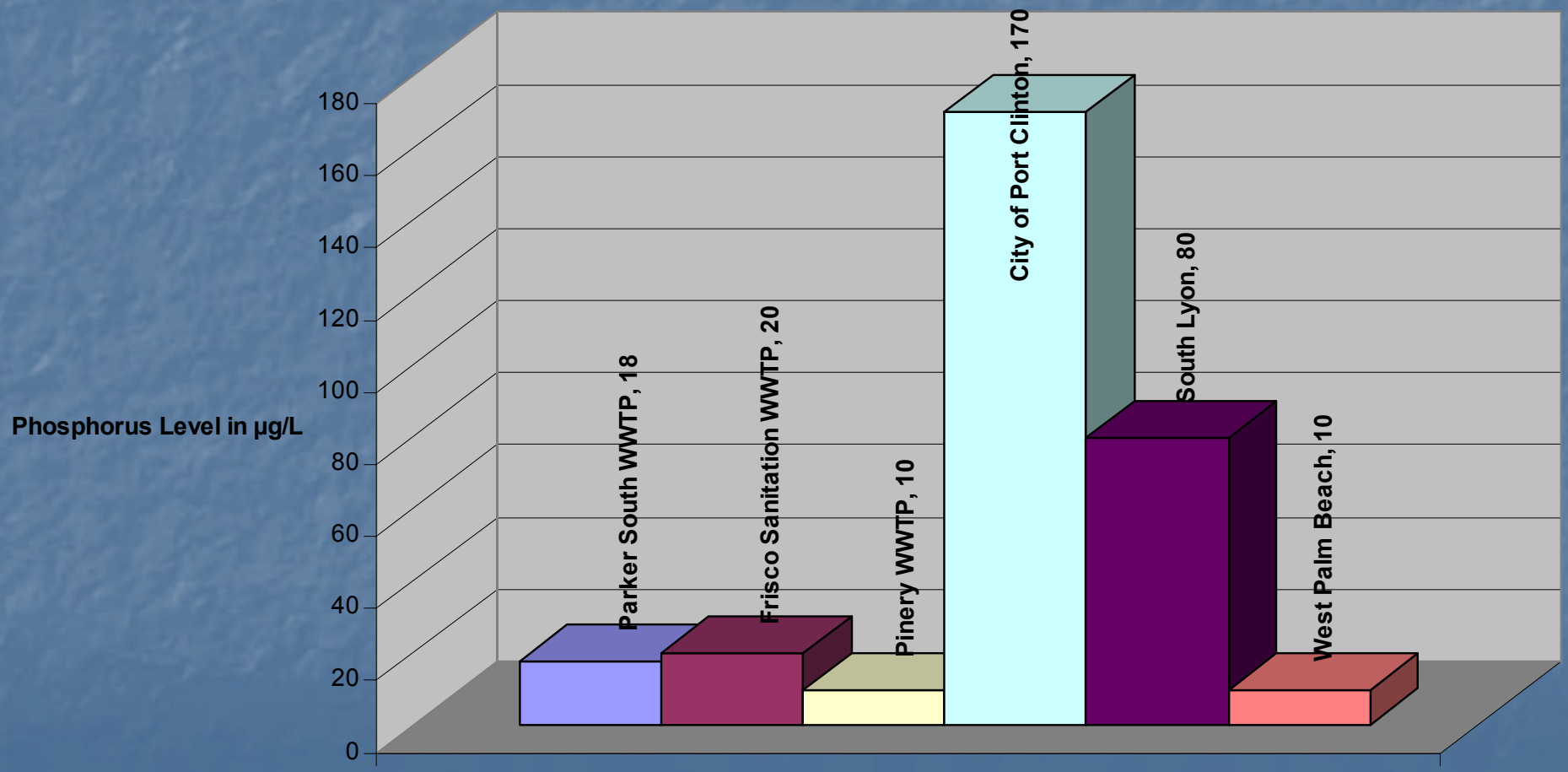
- Also developed a more detailed form in which we insert specific information obtained for facilities.
- This form insures consistency and completeness of the collected data.

Technology Collection Summary



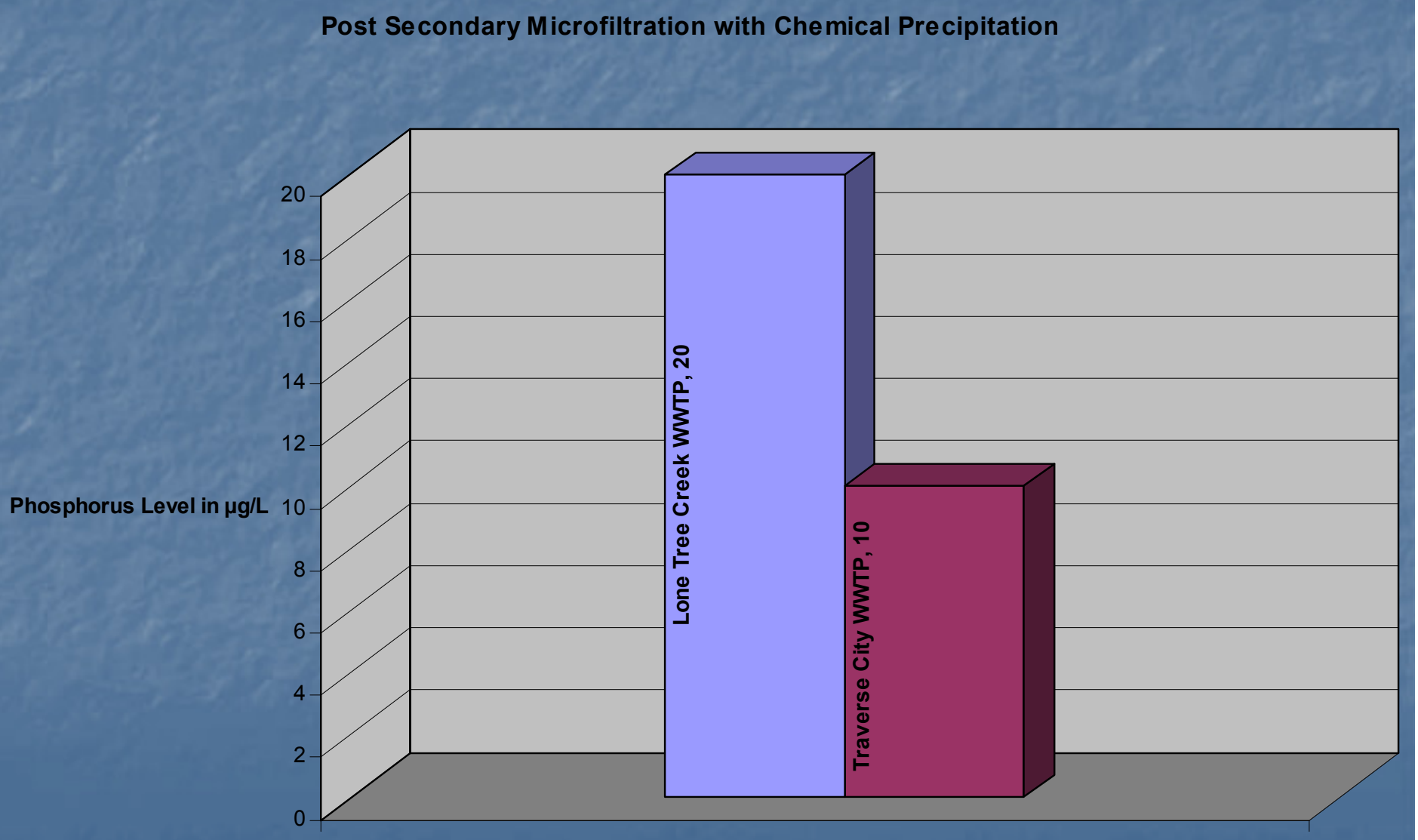
Technology Number 1

Best Phosphorus Levels



Technology Number 3

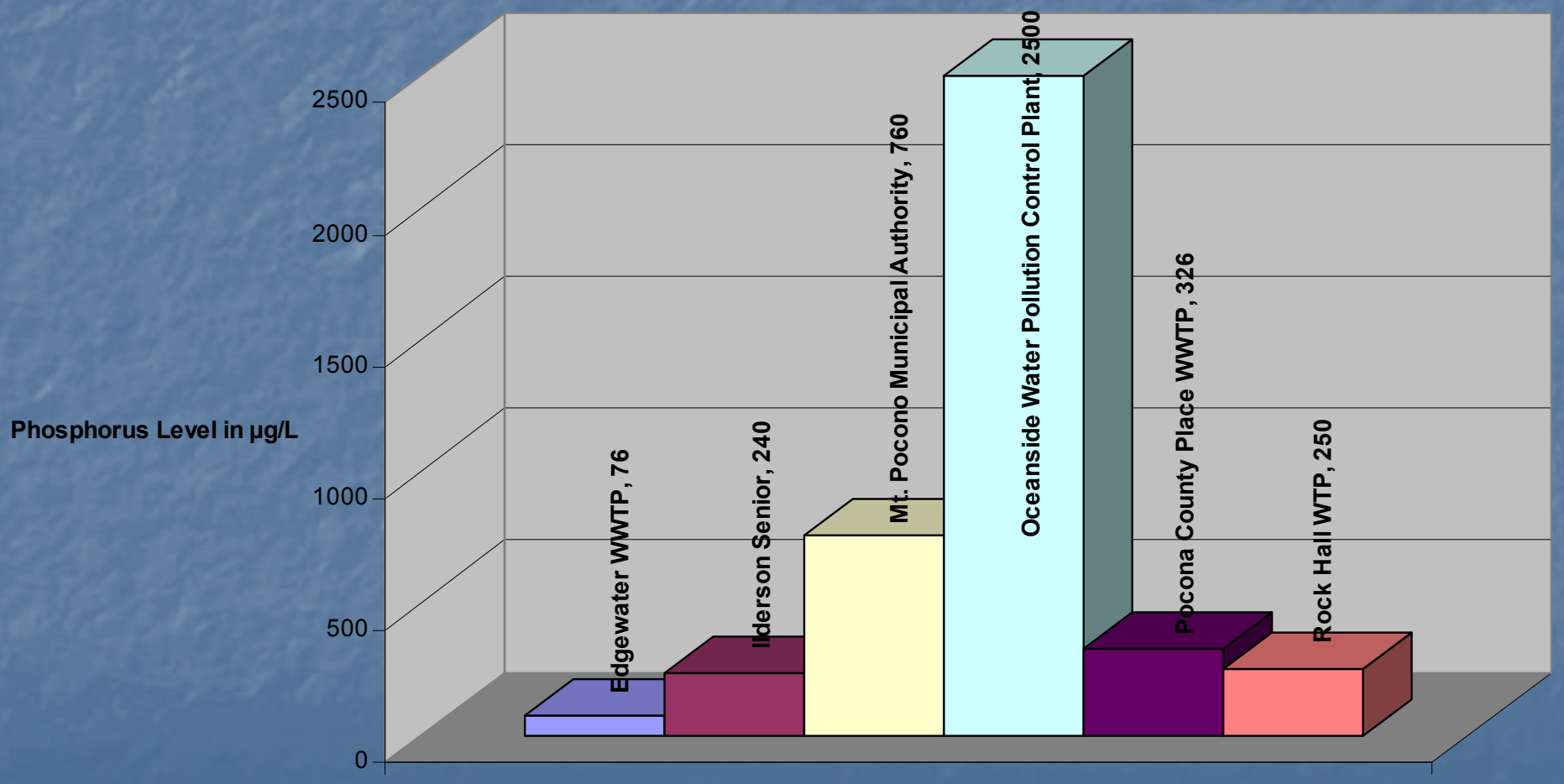
Best Phosphorus Levels



Technology Number 4

Best Phosphorus Levels

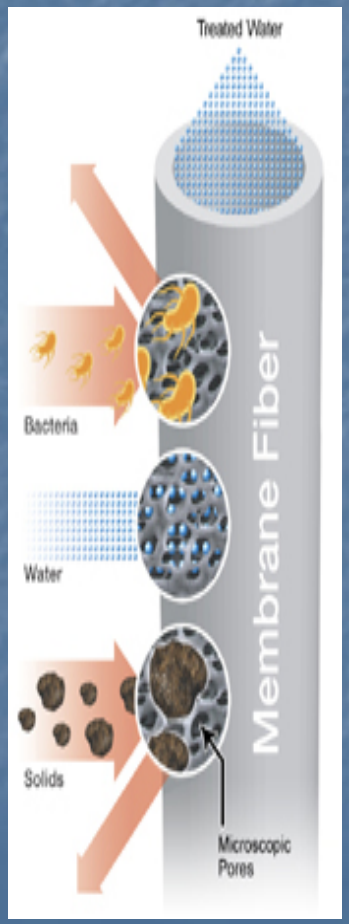
Two Stage Sand Filtration with Chemical Precipitation (Micromedia Filtration)

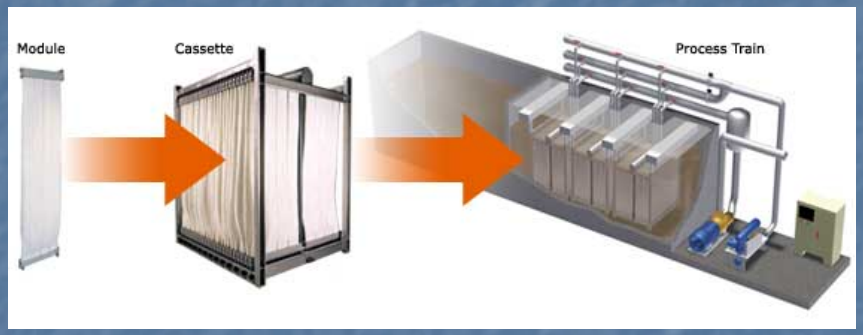


Technology Group Activity

- The Technology Group attended a presentation at Inland Empire Paper (IEP)
- 3 Vendors Presented their Products and their Pilot Programs in Place at IEP
  - Zenon's ZeeWeed System
  - Parkson's Dyna Sand System
  - US Filter's Trident System

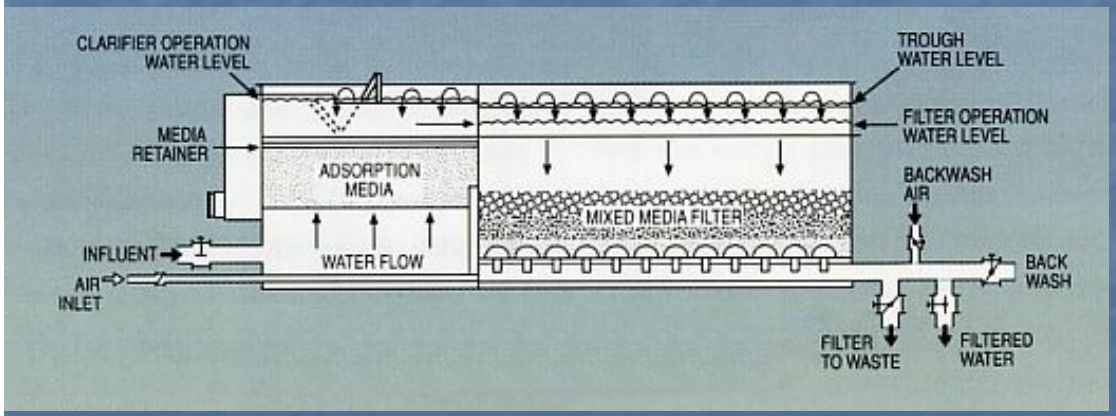
Zenon's ZeeWeed

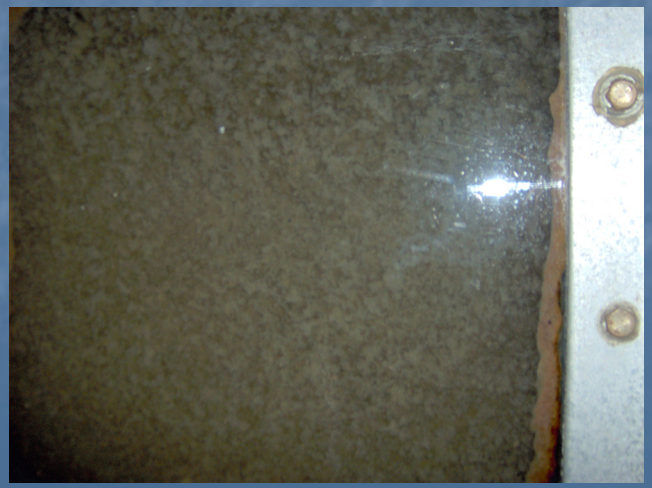




Parkson's Dyna Sand

US Filter's Trident





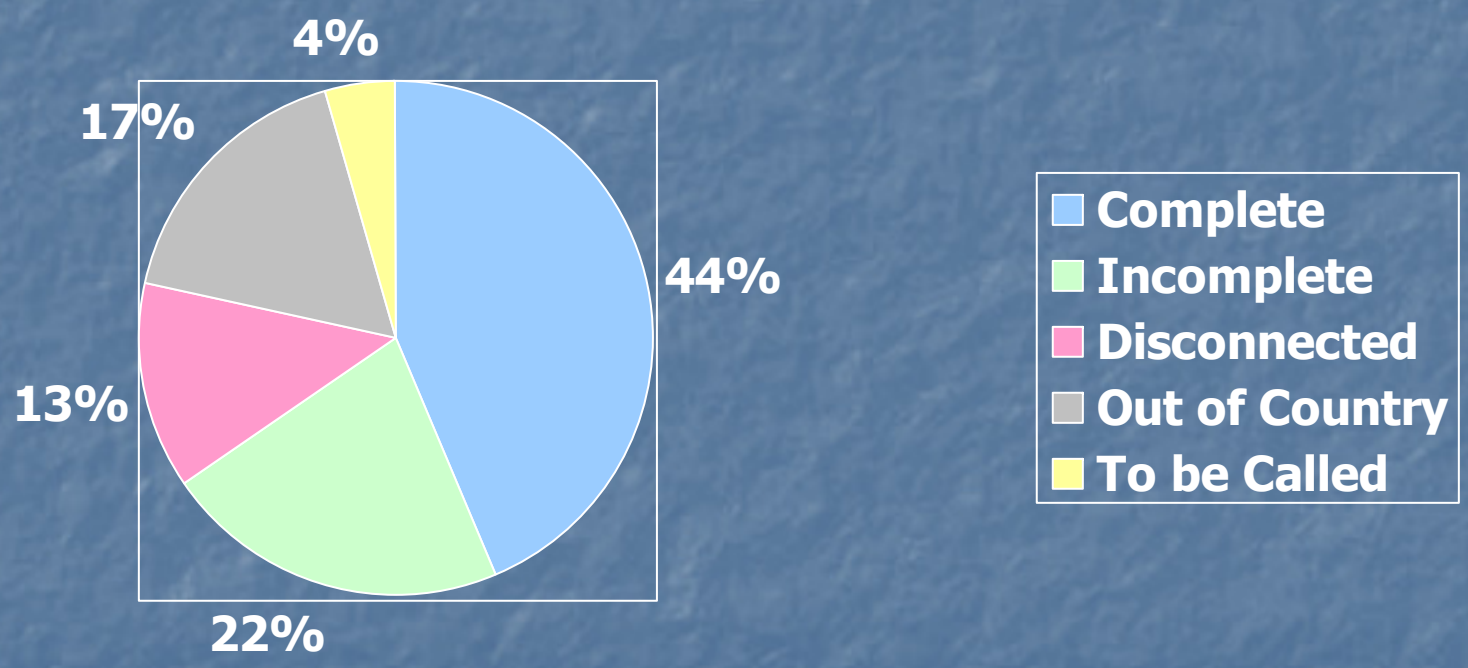
Next Steps

- Presentation of Kruger's Actiflo
- Continue to collect facility data
- "Weed Out" irrelevant facilities
  - e.g. phosphorus is not measured
- Follow up with facilities of interest
- Insert values into summary matrix
- Continue to compile information to respond to Fundamental Questions
- Move Pilot Program to City of Spokane

Questions?

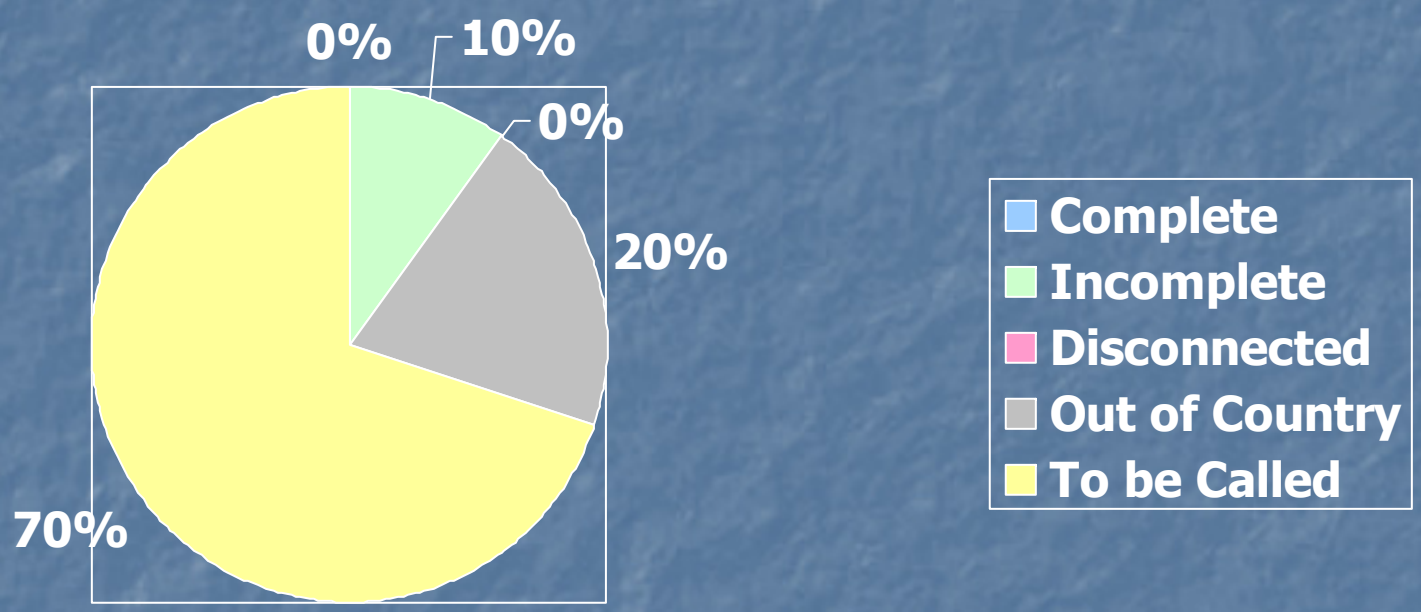
Technology 1

Tertiary Clarification and Granular Media Filtration with Chemical Precipitation



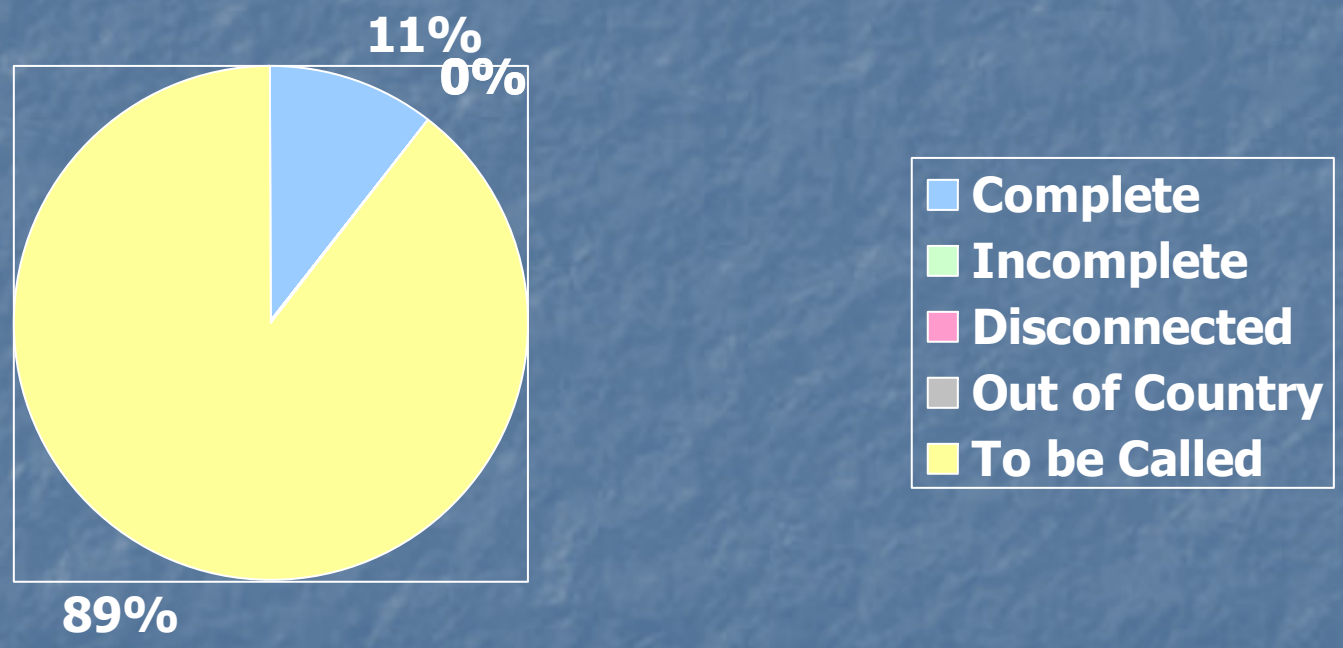
Technology 2

Sequencing Batch Reactor/Membrane Bioreactor with Enhanced Biological Phosphorus Removal and Chemicals



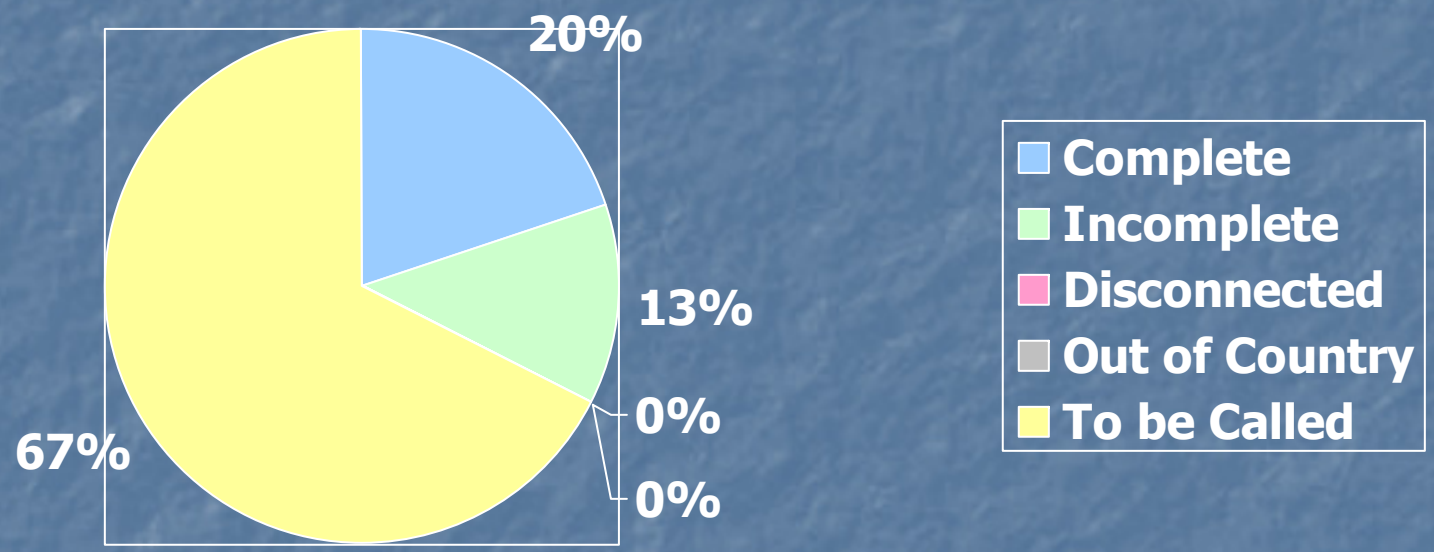
Technology 3

Post Secondary Microfiltration with Chemical Precipitation



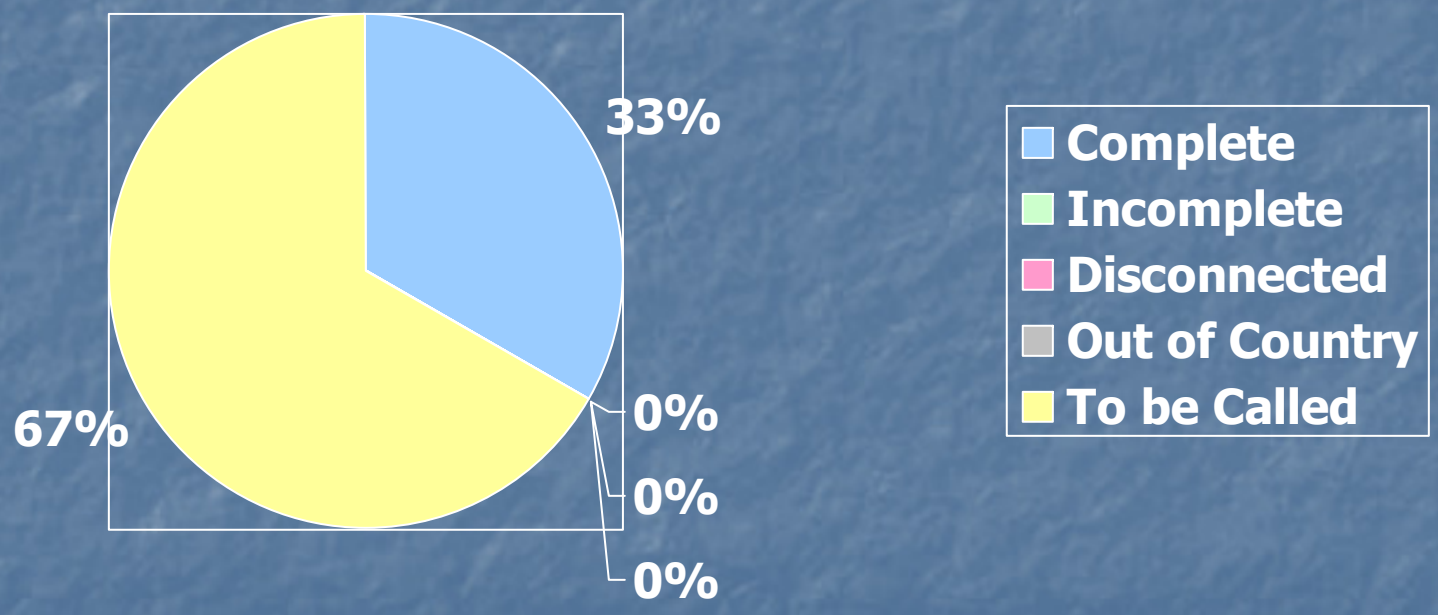
Technology 4

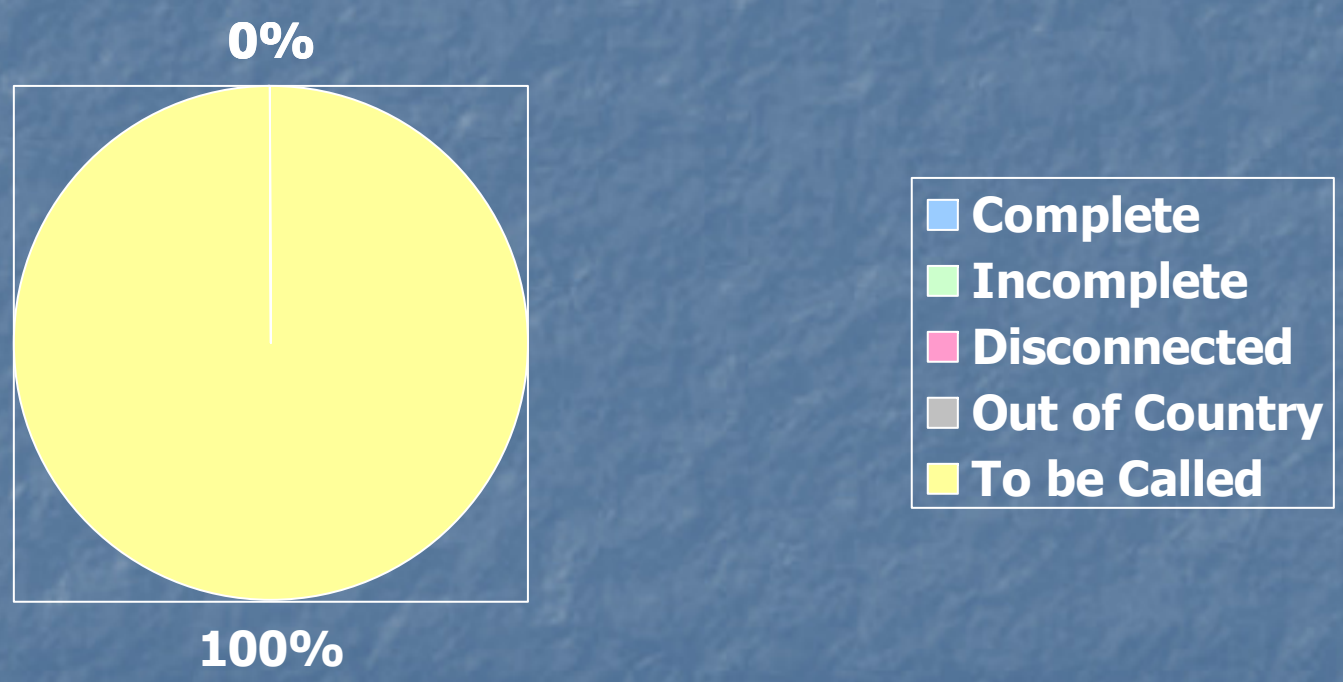
Two Stage Sand Filtration with Chemical Precipitation (Micromedia Filtration)



Technology 5

Post Lime Treatment



Technology 6

Direct Filtration with Chemical Addition