**Pumper – Need to Know**

1. **The professional will understand the various techniques and responsibilities for performing tank maintenance.**
	1. Underground Tank Locating Techniques
		1. Electronic devices
		2. Geophysical
		3. Plumber’s Snake
		4. Witching
		5. Records
		6. Electronics and Camera
		7. Probe (would like to phase out due to damage to system)
	2. Removing the Maintenance Hole Cover
		1. Locating and removing all access lids/covers
		2. Buried Lid – Must pump through manhole and not inspection hole
		3. Landscape Protection
			1. Tarps for soil removal to uncover access
			2. sod removal
		4. Safety Concerns - Blue Stake
			1. Tools Needed
			2. Slip and fall
		5. Above-ground Lid
		6. Concrete Lid
			1. With Loops
			2. Without Loops
		7. Plastic Lid
			1. Special Wrench
		8. Tools Needed
			1. Bar/hooks
			2. Pull/strap/chain
			3. Tool box with various screwdrivers
			4. Shovels
	3. Replacing and/or Adding a Manhole Lid
		1. Legal Requirement
			1. New systems
			2. Existing Systems
				1. Requirements apply to non-complying tank?
				2. Unsecure lids
	4. Manhole and lid specifications
		1. Adding Risers
			1. Pumper’s authority to add risers (AZ current = recommendation only; future = requirement)
			2. Plastic Risers
				1. Advantages
				2. Disadvantages
				3. Riser Requirements – strength, height, diameter
				4. Sealing Tank Lid – Checking for Watertight Seal
			3. Concrete Risers
				1. Advantages
				2. Disadvantages
				3. Riser Requirements – strength, height, diameter
				4. Sealing Tank Lid – Checking for Watertight Seal
	5. Inspection Ports on the Tank (for OBSERVATION purposes ONLY)
		1. Locating
		2. Check for damage
		3. Cap/Cleanout
		4. (replace more like a repair)
	6. Checking Tank Operation
		1. Identify all comparts
			1. How many
			2. Condition
		2. Checking liquid levels
			1. Low level and high levels (surging)
				1. Identification

observation of liquid level below flow line/air-water interface of inlet and outletobservation of liquid level above air space, into riser, or surfacing

* + - * 1. Significance

low level indicates cracks, leakage

high levels indicate:

high peak instantaneous flow

leaking fixture

hydraulic overload (undersized system)

blocked outlet baffle

baffle no longer in place

scum levels too thick

blocked supply pipe (solids, grease, frozen)

identification

remedy

supply pipe sloped in wrong direction

tank installed backwards

tank not level (outlet higher than inlet)

pump not operating

drainfield ponded and draining back to tank

check liquid levels in inspection pipes

* + 1. Checking Stratification
			1. Identification methods
				1. Sludge judge
				2. Stick w/towel and stick with foot
				3. visual evidence of scum layer
				4. Identification of toxic substances (odor, color, told of discharge, factory process water connected to plumbing etc…)
			2. Significance of no stratification
				1. toxic substances
				2. recently pumped
				3. medicine
				4. leaks
				5. peak flow flushing
				6. no baffles
				7. hot water discharge
				8. water softeners
				9. fabric softeners
				10. enzymes
				11. bath salts
				12. paint
			3. Toxic/Hazardous Waste Response
		2. Checking Baffles
			1. Identifying and Assessing/Evaluating Baffles
				1. Inlet
				2. Outlet
				3. Interior
			2. Construction Types
				1. Concrete
				2. Plastic
				3. Wood
				4. Other
			3. Observation Methods
				1. Mirror
				2. Camera & other technology
				3. manhole cover removal
				4. inspection pipe observation
			4. Significance of No Baffles
				1. Regulatory
				2. Operation
			5. Repair Baffles
				1. Pumper authorized to repair baffle – current: recommend; future: requirement to repair
				2. Permit requirements – Dependant on local ordinance
				3. Methods of Repairing Baffles
	1. Safety
		1. Electrical
			1. Hazards
			2. Precautions
		2. Pathogens
			1. Hazards
			2. Precautions
		3. Gases
			1. Poisonous
				1. Hazards
				2. Precautions
			2. Explosive
				1. Hazards
				2. Precautions
			3. Confined Space Entry
		4. Needles
			1. Hazards
			2. Precautions
		5. Chemicals
			1. Hazards
			2. Precautions
	2. Removal of Material
		1. Equipment
			1. Truck
				1. Suction/Lift Requirements

Backwash capabilities

Lift/Distance capabilities

* + - * 1. Axle Weight/Road Restrictions

What are road restrictions/why are they placed?

What roads are affected (state, county, township, city streets)

What are the typical limits

Dates typically imposed

How to calculate with the truck

* + 1.
		2. Back flush/Compete Removal
			1. Significance
			2. Methods
		3. Post Cleaning
			1. Do not disinfect tank
			2. Do not add starters
			3. Manufacturer’s recommendations
		4. Dewatering and return filtered liquid to tank (requires special equipment)
		5. Additives
		6. Spills
			1. Reporting requirements
	1. Dosing Chamber
		1. Tools Required
		2. Manufacturer’s recommendation
	2. Other pumping situations
		1. Grease traps
		2. Pumping requirements
	3. Disposal requirements