King County
Department of
Natural Resources and Parks
Director's Office
King Street Center
201 S Jackson St, Suite 700
Seattle, WA 98104-3855

March 7, 2017

TO: King County Council Members

FR: Christie True, Director, Department of Natural Resources and Parks

RE: West Point Restoration Schedule, Forensic Analysis and Independent Review

I wanted to provide you with the most current information on the progress at the West Point Treatment Plant in advance of media availability at the West Point this afternoon. As I am sure you understand, given the magnitude of the situation, it has taken more time that we would like to identify the extent of the damage, develop a restoration timeline, and identify root causes. I want to make sure that when we provide information that it is both timely and accurate. I am happy to meet with you individually or schedule tours of the plant. Thank you for your patience. We are working around the clock to make this right.

During the early morning hours of February 9, the treatment plant suffered significant damage from flooding resulting from equipment failures. We are treating as much system wastewater as possible at other facilities. At West Point, we are able to treat at a limited primary level, which means incoming wastewater is screened of trash and debris, some organic solids are settled out and removed, and the remaining water is disinfected, and dechlorinated. We are working to restore secondary (biological) treatment as soon as possible.

Our employees and contractors continue to work around-the-clock to safely restore West Point to normal operation. We are making significant progress in restoring the plant. We have an excellent team of engineers, mechanics and electricians who are devoting full attention to restoring the critical systems that will enable West Point to resume the high level of treatment required under state and federal environmental permits.

Our top priority is to resume secondary treatment by April 30. The secondary treatment process relies on beneficial microorganisms to break down the organic solids that weren't removed during the primary treatment process. The flood damage to electrical and mechanical equipment hampered our ability to provide the delicate ecosystem these microorganisms need to treat wastewater to the secondary level. It also temporarily damaged our ability to properly manage the solids that are removed during the treatment process.

We've identified four critical milestones to repair infrastructure that will support restoration of the delicate biological ecosystem:

Milestone 1 —West Primary Treatment — Feb 28
We have completed this first milestone that gets the primary process ready to accept flows and have tanks that can remove the organic solids that settle at the bottom and the fats and oils in the wastewater that float to the top.

Milestone 2 — Digester Heat and Main Digester 3 — March 17
The flood badly damaged the boilers that provide heat at the plant as well as heat to our secondary treatment process microorganisms. There are two boilers that are on the critical path. One of these boilers, Boiler 2, was repaired and up and running on March 6. Boiler 3 is scheduled to be up and running by March 17, when it will again be able to provide crucial heat to one of the main digesters.

Milestone 3 — Solids Handling — April 24
This is a critical step in our process. After many weeks, the boilers are expected to return heat to the digesters and we will again be able to properly process solids.

Milestone 4 — Start up Secondary Treatment — April 30
Restoring the cold, dormant microorganisms to their former vigor is going to require time as well as the expertise of academics and world-renowned experts in wastewater treatment systems we will hire on as consultants. Our goal now is to protect this delicate biology. This will be our intense focus between March 17 and April 30.

The Forensic Analysis:
As you know, we experienced a very intense storm and were at peak flows coming into the plant on February 9. WPTP has handled this level of flow numerous times, year after year. The weather did not cause the bypass and flooding, but it contributed significantly because at this rate of flow there was very little time to respond to any problems. In fact, the time between when the electrical failure occurred in the effluent pumping station and when the primary treatment tanks first started to overflow was only ***12 minutes***.

The problem began with an instantaneous fault in the electrical systems in the effluent pumping station, causing one of the power feeds to shut down which led to all the pumps shutting down. These pumps help move treated wastewater – or effluent – out of the plant and into the deepwater outfall in Puget Sound.

We have systematically examined numerous components in the electrical system and have yet to pinpoint the exact piece of equipment that could have caused this fault. Extensive testing and investigation of the incoming power and have ruled out that as a potential cause. Our attention for the last two weeks has been focused on a transformer, but the results from transformer oil testing that came in late last Friday similarly did not indicate a problem with that equipment. Our attention has now shifted to a relay switch and we will continue to trace through the system until we find the source of the problem.

Once the effluent pumps went offline, the plant operators worked to hold flows within the plant while electricians worked to restart the pump station and avoid a raw sewage bypass. Under these circumstances, automated systems are designed to protect the plant. When this automated system senses levels are within one foot of the top of the tanks, the sewage pumps automatically shut down and the emergency bypass gates automatically open.

These level sensors, or float switches, did not work. If they had worked properly, the flooding in the plant would not have happened. Based on our initial investigation, it appears that bends in the rods connecting the floats created friction which may have prevented the floats from working properly. The bends may have occurred during routine maintenance and testing of the floats. A diagram of these switches is attached.

In summary, as of today, this event appears to have its roots in electrical and equipment failures. The personnel in charge of the plant during the incident are licensed, skilled professionals who followed appropriate training and protocols. We will continue to obtain additional information and keep you informed.

We are fortunate that no lives were lost. Mechanical equipment has been salvaged and restored, and electrical wiring and systems can be replaced. The challenge now is to repair and rehabilitate equipment that will enable us to manage the startup of a biological system so we can resume treating wastewater to the secondary level.

Independent review

Lastly, I would like to let you know that we have hired the firm of Woodard and Curran which has extensive expertise in water and wastewater infrastructure, including operations and maintenance, control systems and automation to conduct an independent review of the February 9 incident as well as anything that may have happened earlier that led to the problems we experienced on this day.

The forensic analysis that CH2M conducted has already offered insight into our operations and protocols and we expect the State Department of Ecology to also conduct an extensive review. This independent review is an opportunity to go beyond that by taking a top-to-bottom comprehensive evaluation of our operations and maintenance.

I expect Woodard and Curran to be comprehensive and thorough in its review and provide recommendations on what we can do to prevent a similar problem in the future. As soon as possible we would like to introduce the experts to the Council and seek your input into the review.

Please let me know if you have any further questions at this time. We are committed to keeping the council informed on a regular basis as we proceed with restoration.

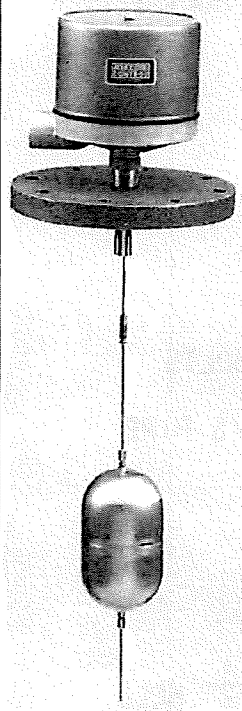
cc: The Honorable Dow Constantine, King County Executive, King County Executive Office (KCEO)
Rhonda Berry, Deputy Executive for Operations, KCEO
Shannon Braddock, Acting Council Relations Director, KCEO
Mark Isaacson, Division Director, Wastewater Treatment Division, Department of Natural Resources and Parks

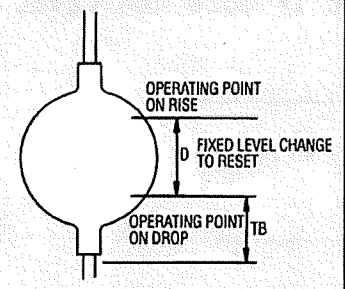
Mercoid®

Series 301

Top Mount — Float Type

Single Stage for Alarms, Depth to 12 ft. Hermetically Sealed Switches





NOTE

Float travel is limited by the lower extremity of the armature tube, or when provided, by the end of the support extension. Float rods and extensions may be altered to obtain the minimum and maximum operating levels shown in the tables.

If control has been furnished for specified operating levels, the float rod supplied will provide ±2" adjustment of such levels.

If tank depth is critical a section of float rod below lower clamp (stop) may be cut off.

CHART D
Float Actuation
Switch Level Change — Single Stage Operation

CM = CENTIMETERS MM = MILLIMETERS M = METERS		THE OPERATING DEPTH MUST BE SPECIFIED BETWEEN THESE LIMITS		FIXED LEVEL CHANGE "D" BETWEEN ON AND OFF	MINIMUM TANK DEPTH REQUIRED BELOW LOW OPERATING POINT "TB"
SPECIFIC GRAVITY	FLOAT C = COPPER SS = STAINLESS STEEL	MINIMUM HIGH LEVEL OPERATING POINT (ON RISE) FROM TOP OF FLANGE	MAXIMUM LOW LEVEL OPERATING POINT (ON DROP) FROM TOP OF FLANGE		
1.0	4 1/2" C	9" 22.9 cm	96" 2.44 M	3/4" 19 mm	5 3/4" 14.6 cm
	4 1/2" SS	9 3/8" 23.8 cm	144" 3.66 M	3/4" 19 mm	5 3/4" 14.6 cm
	7" SS	10 3/4" 27.3 cm	144" 3.66 M	1/2" 13 mm	6" 15.2 cm
	3 1/2" x 6" SS	9 7/8" 25 cm	144" 3.66 M	7/8" 22 mm	7 5/8" 19.4 cm
.90	4 1/2" C	8 3/4" 22.2 cm	84" 2.13 M	7/8" 22 mm	6 1/8" 15.6 cm
	4 1/2" SS	9 1/4" 23.5 cm	144" 3.66 M	1" 25 mm	6 1/8" 15.6 cm
	7" SS	10 5/8" 27 cm	144" 3.66 M	1/2" 13 mm	6 1/4" 15.9 cm
	3 1/2" x 6" SS	9 3/8" 23.8 cm	96" 2.44 M	1 1/8" 29 mm	7 7/8" 20.0 cm
.82	4 1/2" C	8 1/2" 21.6 cm	72" 1.83 M	1" 25 mm	6 1/4" 15.9 cm
	4 1/2" SS	8 3/4" 22.9 cm	108" 2.74 M	7/8" 22 mm	6 1/4" 15.9 cm
	7" SS	10 1/2" 26.7 cm	144" 3.66 M	1/2" 13 mm	6 3/4" 17 cm
	3 1/2" x 6" SS	9 1/8" 23.2 cm	72" 1.83 M	1 1/4" 32 mm	8" 20.3 cm
.75	4 1/2" SS	8 3/8" 21.3 cm	72" 1.83 M	1" 25 mm	6 1/2" 16.5 cm
	7" SS	10 3/8" 26.4 cm	144" 3.66 M	5/8" 16 mm	6 7/8" 17.5 cm
	3 1/2" x 6" SS	8 7/8" 22.5 cm	48" 1.22 M	1 1/2" 38 mm	8" 20.3 cm
.50	7" SS	9 3/4" 23.5 cm	144" 3.66 M	3/4" 19 mm	6 3/4" 17 cm

Repeatability ± 1/4"

The reliable 301 Series has proven to be a rugged economical choice for top mounting on tanks where side mounting is not practical, or for use in sumps. These units feature a fixed deadband for high or low alarm or shutdown. This control can be mounted on top of any closed or open tank or sump by use of the 3/4" NPT connection. Flanges are also available in various sizes, pressure rating and material to meet any installation. Several size floats are available to accommodate liquids to a specific gravity of 0.5 and depths to 12 feet.

Electrical switch actions, SPST (SPDT) (DPDT) or (DPST), can be ordered to satisfy most applications. Two-stage operation available, consult factory. Hermetically sealed snap action or mercury contacts provide for high or low current or voltage requirements. Enclosures include general purpose NEMA-1, weatherproof NEMA-4, explosion-proof NEMA-7, 9. The explosion-proof, vapor proof version combines weatherproof, vapor proof, and explosion-proof NEMA-4, 7, 9 construction in one enclosure. The 301 Series can be used on pressurized vessels.

APPLICATIONS

Oil refineries, chemical plants, power generating stations, pumping stations, sanitary/waste water facilities, sumps, open or closed tanks and vessels.

SPECIFICATIONS

Minimum Specific Gravity: Dependent on float size and rod length. See chart A.

Switch Type: Snap action or mercury. See charts D and E.

Electrical Rating: See charts D and E.

Wiring Connection: G, WT or E enclosure, terminal board. EV enclosure 18" (460 mm) leads.

Enclosures: G, painted steel and aluminum. WT, painted steel, aluminum and neoprene. E, aluminum. EV, aluminum and neoprene.

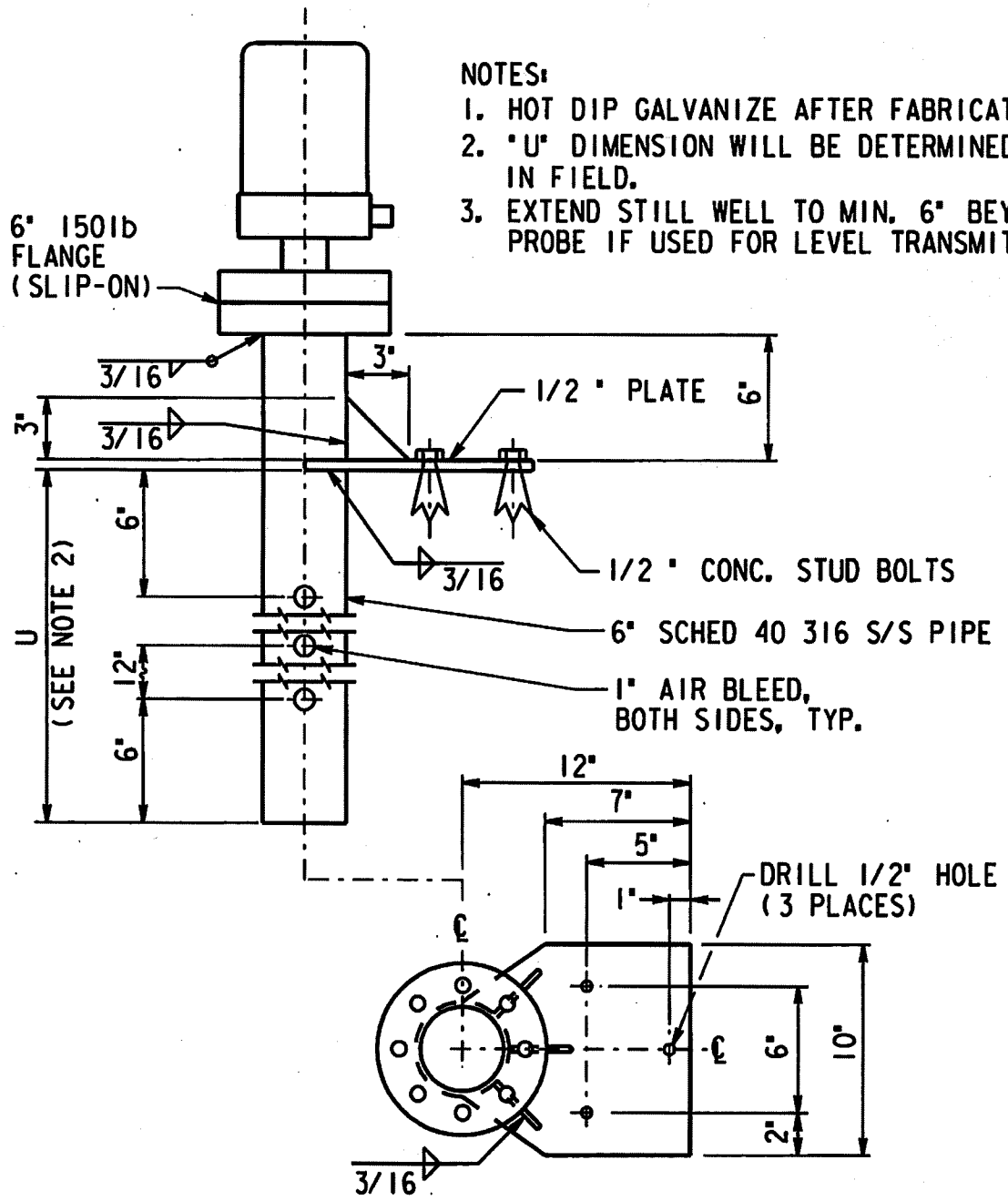
Wetted Parts: See model chart.

Approximate Weight: 301G, WT with 4½" SS float, 8 ft. rod, 5" 125# cast iron flange. Approximately 35 lb (16 kg) with E, EV enclosure 39 lb (17.7 kg).

Suggested Specification

Liquid level control shall be top mount, float operated with fixed deadband for alarm service, (insertion depth, float and flange type to be specified). Circuit shall be hermetically sealed (SPST) (SPDT) DPDT snap action (mercury) switch. Enclosure shall be general purpose (weatherproof) (explosion-proof) (explosion-proof - vapor proof).

NOTES:
1. HOT DIP GALVANIZE AFTER FABRICATION.
2. "U" DIMENSION WILL BE DETERMINED IN FIELD.
3. EXTEND STILL WELL TO MIN. 6" BEYOND PROBE IF USED FOR LEVEL TRANSMITTER.



LEVEL SWITCH AND TRANSMITTER INSTALLATION

17250

DESIGNED:	CHKD:	King County	Department of Natural Resources	DATE: Apr 30/98
DRAWN:	SCALE: None		LEVEL SWITCH AND TRANSMITTER INSTALLATION	FILE NO:
RECOMMENDED:	CONTRACT:			STANDARD DETAIL NO. SD17250
APPROVED:				