

MEMORANDUM

TO: Karen Mohling, Deputy Chief Fire Marshall, Tualatin Valley Fire and Rescue

FROM: Eric Eisemann, E2 and Use Planning Services and Jude Grounds, P.E., MWH Global

SUBJECT: LO-Tigard WTP, 4260 Kenthorpe Way, West Linn - Land Use Review Comments

DATE: December 28, 2011

Thank you for the opportunity to meet with you, Captain Bonollo and Mr. Jim Everett on December 27 to discuss the proposed improvements to the Lake Oswego Water Treatment Plant (WTP). We appreciate your willingness to meet with us in a pre-application review and the insights you provided.

During the course of our meeting we discussed the following points as outlined in your October 28, 2011 letter, written in response to the September 1, 2011 West Linn-sponsored pre-application conference. Although our designs for the WTP upgrade are still preliminary, we understand that if we demonstrate compliance with the issues you raise below and also work collaboratively with the TVFR during the design process, the TVFR will endorse this proposed land use application predicated on the following criteria, comments and recommended conditions of approval.

Our responses to each issue we discussed are interlined below.

- 1) **FIRE APPARATUS ACCESS ROAD DISTANCE FROM BUILDING AND TURNAROUNDS:**
Access roads shall be within 150 feet of all portions of the exterior wall of the first story of the building as measured by an approved route around the exterior of the building. An approved turnaround is required if the remaining distance to an approved intersecting roadway, as measured along the fire apparatus access road, is greater than 150 feet. (Oregon Fire Code C 503.1.1)
- Response:** The exterior walls of all buildings shall be located within 150 feet of an access road.
- 2) **DEAD END ROADS:** Dead end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround. (OFC 503.2.5)
- Response:** The site design will not include dead-end roads.
- 3) **FIRE APPARATUS ACCESS ROAD EXCEPTION FOR AUTOMATIC SPRINKLER PROTECTION:** When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access may be modified as approved by the fire code official. (OFC 503.1.1)

Response: The preliminary and final design will demonstrate compliance with this standard. The Operations and Administration Buildings will be sprinkled. The design team will work collaboratively with

TVFR re; determination of the need for sprinkling in other process areas, including the galleries and electrical rooms.

- 4) **ADDITIONAL ACCESS ROADS – COMMERCIAL:** Where buildings exceed 30 feet in height or three stories in height shall have at least two separate means of fire apparatus access. Buildings or facilities having a gross area of more than 62,000 square feet shall be provided with at least two separate means of fire apparatus access. Buildings up to 124,000 square feet provided with fire sprinklers may have a single access. (OFC D104)

Emergency access would be improved with a second access point to Mapleton.

Response: The maximum building heights are currently considered to be: Existing Operations – 35 feet, Administration – 29 feet, Mechanical De-watering - 30 feet, Finish Water Pump Station -30 feet, Electrical/Maintenance Building – 30 feet, Chemical Building – 32 feet; though not anticipated result in major modifications, these heights are subject to further refinement during detailed design,. In no event, shall a building height exceed 35 feet. Therefore, the current site design will include fire and emergency access routes form Kenthorpe Way and Mapleton Drive. Preliminary and final design will demonstrate compliance with this standard.

- 5) **AERIAL FIRE APPARATUS ACCESS:** Buildings or portions of buildings or facilities exceeding 30 feet in height above the lowest level of fire department vehicle access shall be provided with approved fire apparatus access roads capable of accommodating fire department aerial apparatus. Overhead utility and power lines shall not be located within the aerial fire apparatus access roadway. Fire apparatus access roads shall have a minimum unobstructed width of 26 feet in the immediate vicinity of any building or portion of building more than 30 feet in height. At least one of the required access routes meeting this condition shall be located within a minimum of 15 feet and a maximum of 30 feet from the building, and shall be positioned parallel to one entire side of the building. (OFC D105)

Response: The visitor parking lot abutting the Administration and Operations Buildings provides approximately 52 feet of unobstructed access to the buildings. The internal route which provides access to the other buildings 30 feet or taller is currently proposed to be 24 feet wide without curbs. On either side of the internal access road there is a clear and unobstructed space which, when added to the proposed 24 foot access road width, will exceed the 26 foot standard in all areas. However, if this is not acceptable to the TVFR, the internal access road can be designed to meet the 26-foot road width standard.

- 6) **REMOTENESS:** Where two access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses. (OFC D104.3)

Response: The site will provide an emergency access route on both Kenthorpe Way and Mapleton Drive in compliance with this standard.

- 7) **FIRE APPARATUS ACCESS ROAD WIDTH AND VERTICAL CLEARANCE:** Fire apparatus access roads shall have an unobstructed width of not less than 20 feet (12 feet for up to two dwelling units and accessory buildings), and an unobstructed vertical clearance of not less than 13 feet 6 inches. Where fire apparatus roadways are less than 26 feet wide, “NO PARKING” signs shall be installed on both sides of the roadway and in turnarounds as needed. Where fire apparatus roadways are more than 28 feet wide but less than 32 feet wide, “NO PARKING” signs shall be installed on one side of the roadway and in turnarounds as needed. Where fire apparatus roadways are 32 feet wide or more, parking is not restricted. (OFC 503.2.)

Response: Per discussions with TVFR, this requirement applies to residential construction with roadside

parking, and is not applicable to the WTP project.

- 8) **FIRE APPARATUS ACCESS ROADS WITH FIRE HYDRANTS:** Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet. (OFC D103.1)

Response: The fire hydrants shall be spaced no further than 500 feet apart around the perimeter of the internal access road and in front of the Administration and Operations buildings.

- 9) **NO PARKING SIGNS:** Where fire apparatus roadways are not of sufficient width to accommodate parked vehicles and 20 feet of unobstructed driving surface, “No Parking” signs shall be installed on one or both sides of the roadway and in turnarounds as needed. Roads 26 feet wide or less shall be posted on both sides as a fire lane. Roads more than 26 feet wide to 32 feet wide shall be posted on one side as a fire lane. Signs shall read “NO PARKING - FIRE LANE” and shall be installed with a clear space above grade level of 7 feet. Signs shall be 12 inches wide by 18 inches high and shall have red letters on a white reflective background. (OFC D103.6)

Response: Dedicated off-road staff parking is currently included in the site layout; parking along the internal access route is not allowed. See Note 8 above for discussion of the roadway shoulder along the 24-foot proposed access roadway that provides >26-foot effective width throughout the plant. For these reasons, no “No Parking” signs are currently included in the design.

- 10) **SURFACE AND LOAD CAPACITIES:** Fire apparatus access roads shall be of an all-weather surface that is easily distinguishable from the surrounding area and is capable of supporting not less than 12,500 pounds point load (wheel load) and 60,000 pounds live load (gross vehicle weight). You may need to provide documentation from a registered engineer that the design will be capable of supporting such loading. (OFC D102.1)

Response: The Kenthorpe Way access, visitor parking area and internal access road will comply with this standard. The emergency access road from Mapleton Drive will comply with this standard by providing a 12 foot wide paved surface and two four-foot shoulders made of pervious material, such as ‘grasspave’, that will comply with this standard. The entire southern emergency access road will provide a 20-foot wide unobstructed access road that is capable of supporting a 60,000 pound live load.

- 11) **BRIDGES:** Where a bridge or an elevated surface is part of a fire apparatus access road, the bridge shall be constructed and maintained in accordance with AASHTO *Standard Specification for Highway Bridges*. Bridges and elevated surfaces shall be designed for a live load sufficient to carry the imposed loads of fire apparatus. Vehicle load limits shall be posted at both entrances to bridges when required by the fire code official. Where elevated surfaces designed for emergency vehicle use are adjacent to surfaces which are not designed for such use, approved barriers, approved signs or both shall be installed and maintained when required by the fire code official. (OFC 503.2.6)

Response: There are no bridges on site; therefore this standard is not applicable.

- 12) **TURNING RADIUS:** The inside turning radius and outside turning radius shall be not less than 28 feet and 48 feet respectively, measured from the same center point. (OFC 503.2.4 & D103.3)

Response: The turning radii on all driveway approaches and along the internal access road shall meet or exceed this standard.

- 13) **PAINTED CURBS:** Where required, fire apparatus access roadway curbs shall be painted red and marked “NO PARKING FIRE LANE” at approved intervals. Lettering shall have a stroke of not less than one inch wide by six inches high. Lettering shall be white on red background. (OFC 503.3)

Response: Per discussions with TVFR, this standard applies to streets and does not apply to the internal

access road or visitor parking lot.

- 14) **GRADE:** Fire apparatus access roadway grades shall not exceed 10 percent. Intersections and turnarounds shall be level (maximum 5%) with the exception of crowning for water run-off. When fire sprinklers are installed, a maximum grade of 15% may be allowed. The approval of fire sprinklers as an alternate shall be accomplished in accordance with the provisions of ORS 455.610(5). (OFC 503.2.7 & D103.2)

Response: The grade across the entire site does not exceed 2%; therefore this standard is met.

- 15) **GATES:** Gates securing fire apparatus roads shall comply with all of the following: Minimum unobstructed width shall be 16 feet, or two 10 foot sections with a center post or island; gates shall be set back at minimum of 30 feet from the intersecting roadway; gates shall be of the swinging or sliding type; manual operation shall be capable by one person; electric gates shall be equipped with a means for operation by fire department personnel; locking devices shall be approved. (OFC D103.5) ***Removable bollards are not an approved alternate to a swinging gate.***

Response: Access to the internal compound area shall be controlled by automatic rolling gates. Access to the emergency off of Mapleton Drive will be controlled by a swing gate with an integral pedestrian passageway.

- 16) **COMMERCIAL BUILDINGS - REQUIRED FIRE FLOW:** The required fire flow for the building shall not exceed 3,000 gallons per minute (GPM) or the available GPM in the water delivery system at 20 psi, whichever is less as calculated using IFC, Appendix B. A worksheet for calculating the required fire flow is available from the Fire Marshal's Office. (IFC B105.3) ***Please provide a current fire flow test of the nearest fire hydrant demonstrating available flow at 20 psi residual pressure as well as fire flow calculation worksheets. Please forward copies to both TVF&R as well as West Linn Water Department. Fire flow calculation worksheets as well as instructions are available on our web site at www.tvfr.com.***

Response: The WTP provides all of its own water for fire flow, as well as for consumption. During the design phase, the applicant shall provide fire flow calculations for each building on site, and will share design calculations of the distribution piping to demonstrate compliance with this standard.

- 17) **FIRE HYDRANTS – COMMERCIAL BUILDINGS:** Where a portion of the building is more than 400 feet from a hydrant on a fire apparatus access road, as measured in an approved route around the exterior of the building, on-site fire hydrants and mains shall be provided. This distance may be increased to 600 feet for buildings equipped throughout with an approved automatic sprinkler system. (OFC 508.5.1)

Please show hydrant locations for approval.

Response: Fire hydrants will be provided on-site and around the perimeter of the internal access road and in front of the Administration and Operations Buildings. See the attached Fire and Emergency Access Plan, showing the location of each fire hydrant on-site in compliance with this standard.

- 18) **FIRE HYDRANT NUMBER AND DISTRIBUTION:** The minimum number and distribution of fire hydrants available to a building shall not be less than that listed in Appendix C, Table C 105.1.

Considerations for placing fire hydrants may be as follows:

- Existing hydrants in the area may be used to meet the required number of hydrants as approved. Hydrants that are up to 600 feet away from the nearest point of a subject building that is protected with fire sprinklers may contribute to the required number of hydrants.

Response: See the attached Fire and Emergency Access Plan, showing the location of each fire hydrant on-site in compliance with this standard.

- 19) **FIRE HYDRANT DISTANCE FROM AN ACCESS ROAD:** Fire hydrants shall be located not more than 15 feet from an approved fire apparatus access roadway. (OFC C102.1)

Response: No fire hydrant will be more than 15 feet from an approved access road. See the attached Fire and Emergency Access Plan, showing the location of each fire hydrant on-site in compliance with this standard.

- 20) **REFLECTIVE HYDRANT MARKERS:** Fire hydrant locations shall be identified by the installation of reflective markers. The markers shall be blue. They shall be located adjacent and to the side of the centerline of the access road way that the fire hydrant is located on. In case that there is no center line, then assume a centerline, and place the reflectors accordingly. (OFC 510.1)

Response: The applicant will identify and mark fire hydrants in compliance with this standard.

- 21) **PHYSICAL PROTECTION:** Where fire hydrants are subject to impact by a motor vehicle, guard posts, bollards or other approved means of protection shall be provided. (OFC 508.5.6)

Response: The applicant will protect fire hydrants in compliance with this standard.

- 22) **CLEAR SPACE AROUND FIRE HYDRANTS:** A 3 foot clear space shall be maintained around the circumference of fire hydrants. (OFC 508.5.5)

Response: The applicant will maintain a 3-foot clear space around the circumference of each fire hydrant.

- 23) **FIRE HYDRANT/FIRE DEPARTMENT CONNECTION:** A fire hydrant shall be located within 100 feet of a fire department connection (FDC). Fire hydrants and FDCs shall be located on the same side of the fire apparatus access roadway. FDCs shall normally be remote except when approved by the fire code official. Fire sprinkler FDCs shall be plumbed to the fire sprinkler riser downstream of all control valves. Each FDC shall be equipped with a metal sign with 1 inch raised letters and shall read, "AUTOMATIC SPRINKLERS OR STANDPIPES" or a combination thereof, as applicable. (OFC 912.2)

Response: The applicant shall provide individual FDCs for each building that contains a sprinkler system. All FDCs will be located at the front of either the Existing Operations Building or the new Administration Building. Each sprinkled building will contain a sprinkler riser, located near the primary entrance.

- 24) **ACCESS AND FIRE FIGHTING WATER SUPPLY DURING CONSTRUCTION:** Approved fire apparatus access roadways and firefighting water supplies shall be installed and operational prior to any combustible construction or storage of combustible materials on the site. (OFC 1410.1 & 1412.1)

Response: In order to provide continuous flow of fresh potable water from the WTP during construction, the project will involve the sequential demolition and construction of each of the proposed new facilities. Each element of demolition and construction has been designed to ensure approved fire access roads and water supplies can be consistently maintained throughout, in compliance with this standard.

- 25) **KNOX BOX:** A Knox Box for building access is required for this building. Please contact the Fire Marshal's Office for an order form and instructions regarding installation and placement. (OFC 506)

Response: The KNOX box will be located near the front door of either the Existing Operations Building or new Administration Building. KNOX switches will be incorporated into each electrically-actuated rolling gate, a 'daisy-chain' padlock will control all manual gates on the site, including the proposed pipe gate at Mapleton Drive.

- 26) **PREMISES IDENTIFICATION:** Buildings shall have approved address numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Address numbers shall be

Arabic numerals or alphabet numbers. Numbers shall be a minimum of 4 inches high with a ½ inch stroke. (OFC 505.1)

Response: The applicant will generate building nomenclature and lettering consistent with this standard. For example, buildings could be signed as Building A, Building B, etc. Or, the applicant could erect a building location map near the primary entryway into the Operations Building. The applicant will work in collaboration with the TVFR and the City of West Linn to create and install building orientation labeling that both meets TVFR requirements as well as West Linn Land Use standards.

- 27) FIRE DEPARTMENT ACCESS TO EQUIPMENT:** Fire protection equipment shall be identified in an approved manner. Rooms containing controls for HVAC, fire sprinklers risers and valves or other fire detection, suppression or control features shall be identified with approved signs. (OFC 510.1)

Response: Within building interiors, fire protection equipment shall be installed consistent with this standard.

- 28) HAZARDOUS MATERIAL STORAGE AND USE:** Provide a Hazardous Material Inventory Statement (HMIS) that includes but is not limited to: product name, amount, location, container sizes, and, amount in use (closed & open systems). Depending on the type and amounts of hazardous materials, a Hazardous Material Management Plan (HMMP) may be required. (OFC Chapter 27)

Response: The applicant provided a preliminary HMIS for review and general discussion. Mr. Everett stated that there are no hazardous material issues, at this time. It is appropriate to fully discuss and consider hazardous materials during the design process.

Therefore; TVFR requests that the applicant provide a completed HMIS for review and tentative approval at the time of land use application. As a condition of land use approval, TVFR requests that the applicant prepare a HMMP, if necessary. During the design process, TVFR requests that the applicant engage TVFR in one or more Partnering Meetings to review the type, amount, location, storage, containment and transport of hazardous materials so that the site may be designed to be as safe as is reasonably practicable.

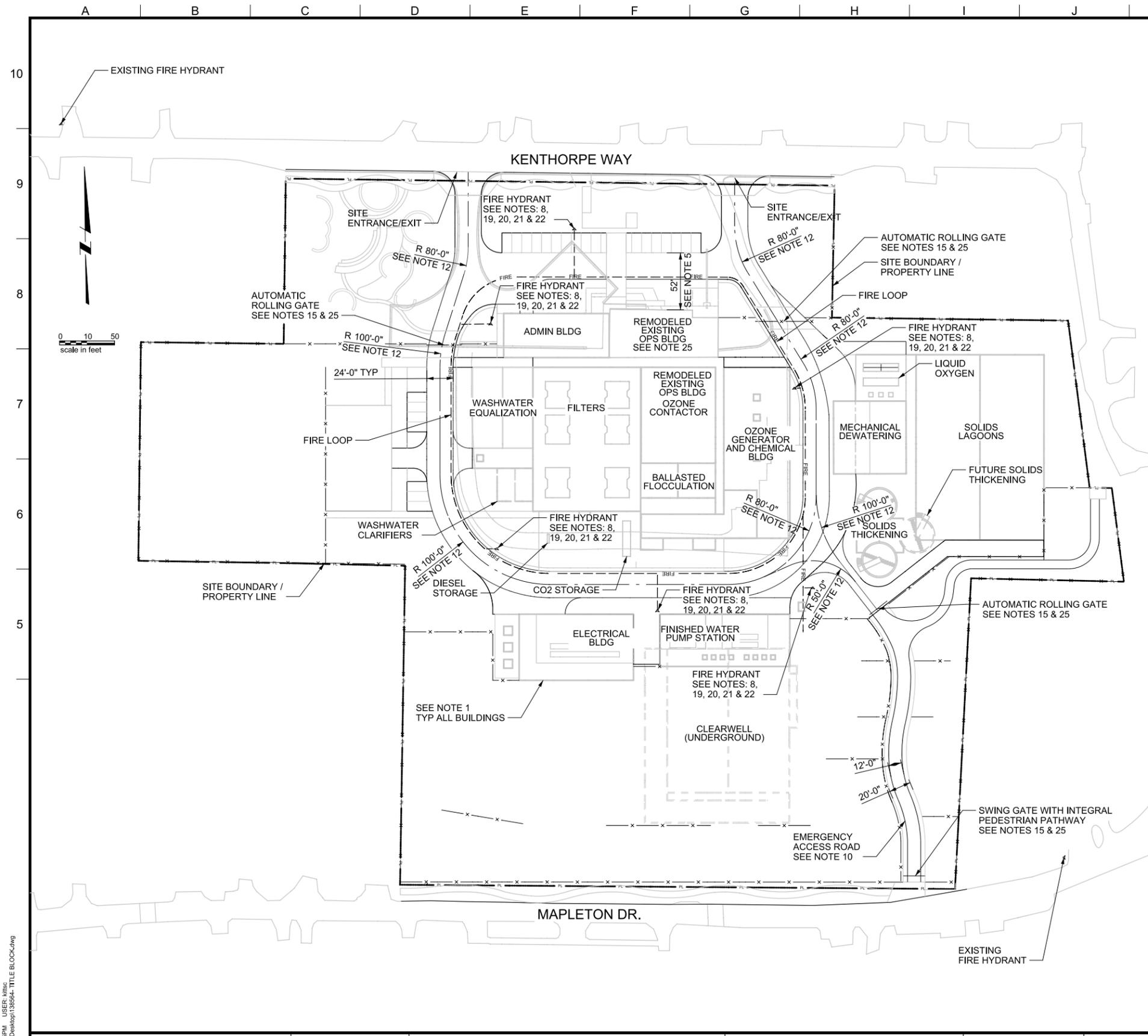
- 29) Resubmit plans for final approval.**

Response: The applicant will provide TVFR with a full set of preliminary plans for review and comment during the land use application process and will provide the TVFR with more detailed design drawings and plans during the subsequent design process.

To the best of our abilities, these notes and responses reflect the conversation and direction provided during the December 27, 2011 meeting. If you have any comments, corrections or additions to make to this letter, please do so at your earliest convenience.

Thank you again for meeting with us and for your guidance.





- GENERAL SHEET NOTES**
- THE FOLLOWING POINTS ARE RESPONSES TVFR CRITERIA SUMMARIZED IN A LETTER DATED OCT. 28, 2011
- THE EXTERIOR OF WALLS SHALL BE LOCATED WITHIN 150 FT OF AN ACCESS ROAD, IN COMPLIANCE WITH OFC 503.1.1.
 - THE SITE DESIGN WILL NOT INCLUDE DEAD-END ROADS, THEREFORE OFC 503.2.5 DOES NOT APPLY.
 - THE PRELIMINARY AND FINAL DESIGN WILL DEMONSTRATE COMPLIANCE WITH OFC 503.1.1. THE OPERATIONS AND ADMINISTRATION BUILDINGS WILL BE SPRINKLED. THE DESIGN TEAM WILL WORK COLLABORATIVELY WITH TVFR RE: DETERMINATION OF THE NEED FOR SPRINKLING IN OTHER PROCESS AREAS, INCLUDING THE GALLERIES AND ELECTRICAL ROOMS.
 - THE MAXIMUM BUILDING HEIGHTS ARE CURRENTLY CONSIDERED TO BE: EXISTING OPERATIONS - 35 FT. ADMINISTRATION - 29 FT. MECHANICAL DEWATERING - 30 FT. FINISH WATER PUMP STATION - 30 FT. ELECTRICAL/MAINTENANCE BUILDING - 30 FT. CHEMICAL BUILDING - 32 FT. THOUGH NOT ANTICIPATED RESULT IN MAJOR MODIFICATIONS, THESE HEIGHTS ARE SUBJECT TO FURTHER REFINEMENT DURING DETAILED DESIGN. IN NO EVENT SHALL A BUILDING HEIGHT EXCEED 35 FT. THEREFORE, THE CURRENT SITE DESIGN WILL INCLUDE FIRE AND EMERGENCY ACCESS ROUTES FROM KENTHORPE WAY AND MAPLETON DRIVE. PRELIMINARY AND FINAL DESIGN WILL DEMONSTRATE COMPLIANCE WITH OFC D104.
 - THE VISITOR PARKING LOT ABUTTING THE ADMINISTRATION AND OPERATIONS BUILDINGS PROVIDES APPROXIMATELY 52 FT OF UNOBSTRUCTED ACCESS TO THE BUILDINGS. THE INTERNAL ACCESS ROADWAY WHICH PROVIDES ACCESS TO THE OTHER BUILDINGS 30 FT OR TALLER IS CURRENTLY PROPOSED TO BE 24 FT WIDE WITHOUT CURBS. ON EITHER SIDE OF THE INTERNAL ACCESS ROAD THERE IS A CLEAR AND UNOBSTRUCTED SPACE WHICH, WHEN ADDED TO THE PROPOSED 24 FT ACCESS ROAD WIDTH, WILL EXCEED THE 26 FT STANDARD IN ALL AREAS, HOWEVER IF THIS IS NOT ACCEPTABLE TO THE TVFR, THE INTERNAL ACCESS ROAD CAN BE DESIGNED TO MEET THE 26 FT ROAD WIDTH STANDARD PER OFC D105.
 - THE SITE WILL PROVIDE AN EMERGENCY ACCESS ROUTE ON BOTH KENTHORPE WAY AND MAPLETON DRIVE IN COMPLIANCE WITH OFC D104.3.
 - PER DISCUSSIONS WITH TVFR, THIS REQUIREMENT APPLIES TO RESIDENTIAL CONSTRUCTION WITH ROADSIDE PARKING AND IS NOT APPLICABLE TO THE WTP PROJECT.
 - THE FIRE HYDRANTS SHALL BE SPACED NO FURTHER THAN 500 FT APART AROUND THE PERIMETER OF THE INTERNAL ACCESS ROAD AND IN FRONT OF THE ADMINISTRATION AND OPERATIONS BUILDINGS PER OFC D103.1.
 - DEDICATED OFF-ROAD STAFF PARKING IS CURRENTLY INCLUDED IN THE SITE LAYOUT; NO PARKING ALONG THE INTERNAL ACCESS ROUTE WILL BE REQUIRED/ALLOWED. SEE NOTE 5 FOR DISCUSSION OF THE ROADWAY SHOULDER ALONG THE 24 FT WIDE PROPOSED ACCESS ROADWAY THAT PROVIDES >26 FT EFFECTIVE WIDTH THROUGHOUT THE PLANT. FOR THESE REASONS, NO "NO PARKING" SIGNS ARE CURRENTLY INCLUDED IN THE DESIGN.
 - THE KENTHORPE WAY ACCESS, VISITOR PARKING AREA AND INTERNAL ACCESS ROAD WILL COMPLY WITH OFC D102.1. THE EMERGENCY ACCESS ROAD FROM MAPLETON DRIVE WILL COMPLY WITH THIS STANDARD BY PROVIDING A 12 FT WIDE PAVED SURFACE AND TWO 4 FT SHOULDERS MADE OF PERVIOUS MATERIAL, SUCH AS "GRASS PAVE", THAT WILL COMPLY WITH THIS STANDARD. THE ENTIRE SOUTHERN EMERGENCY ACCESS ROAD WILL PROVIDE A 20 FT WIDE UNOBSTRUCTED ACCESS ROAD THAT IS CAPABLE OF SUPPORTING A 60,000 POUND LIVE LOAD.
 - THERE ARE NO BRIDGES ON SITE; THEREFORE OFC 503.2.6 IS NOT APPLICABLE.
 - THE TURNING RADI ON ALL DRIVEWAY APPROACHES AND ALONG THE INTERNAL ACCESS ROAD SHALL MEET OR EXCEED OFC 503.2.4 AND D103.3.
 - PER DISCUSSIONS WITH TVFR, OFC 503.3 APPLIES TO STREETS AND DOES NOT APPLY TO THE INTERNAL ACCESS ROAD OR VISITOR PARKING LOT.
 - THE GRADE ACROSS THE ENTIRE SITE DOES NOT EXCEED 2%; THEREFORE ORS 455.610(5), OFC 503.2.7 AND D103.2 ARE MET.
 - ACCESS TO THE INTERNAL COMPOUND AREA SHALL BE CONTROLLED BY AUTOMATIC ROLLING GATES. ACCESS TO THE EMERGENCY ACCESS ROAD OFF OF MAPLETON DRIVE WILL BE CONTROLLED BY A SWING GATE WITH AN INTEGRAL PEDESTRIAN PASSAGEWAY. PER OFC D103.5.
 - THE WTP PROVIDES ALL OF ITS OWN WATER FOR FIRE FLOW, AS WELL AS FOR CONSUMPTION. DURING THE DESIGN PHASE, THE APPLICANT SHALL PROVIDE FIRE FLOW CALCULATIONS FOR EACH BUILDING ON SITE, AND WILL SHARE DESIGN CALCULATIONS OF THE DISTRIBUTION PIPING TO DEMONSTRATE COMPLIANCE WITH IFC B105.3.
 - FIRE HYDRANTS WILL BE PROVIDED ON-SITE AND AROUND THE PERIMETER OF THE INTERNAL ACCESS ROAD AND IN FRONT OF THE ADMINISTRATION AND OPERATIONS BUILDINGS PER OFC 508.5.1.
 - LOCATION OF EACH FIRE HYDRANT ON-SITE IN COMPLIANCE WITH APPENDIX C, TABLE C 105.1.
 - NO FIRE HYDRANT WILL BE MORE THAN 15 FT AWAY FROM AN APPROVED ACCESS ROAD PER OFC C102.1.
 - IDENTIFY AND MARK FIRE HYDRANTS WITH BLUE MARKERS ADJACENT TO THE SIDE OF THE CENTERLINE OF THE ACCESS ROADWAY THAT THE FIRE HYDRANT IS LOCATED ON, IN ACCORDANCE WITH OFC 510.1.
 - PROTECT FIRE HYDRANTS WITH APPROVED MEANS, IN ACCORDANCE WITH OFC 508.5.6.
 - A 3 FT CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF EACH FIRE HYDRANT, IN ACCORDANCE WITH OFC 508.5.5.
 - INDIVIDUAL FDC'S SHALL BE PROVIDED FOR EACH BUILDING THAT CONTAINS A SPRINKLER SYSTEM. ALL FDC'S WILL BE LOCATED AT THE FRONT OF EITHER THE EXISTING OPERATIONS BUILDING OR THE NEW ADMINISTRATION BUILDING. EACH SPRINKLED BUILDING WILL CONTAIN A SPRINKLER RISER, LOCATED NEAR THE PRIMARY ENTRANCE, IN ACCORDANCE WITH OFC 912.2.
 - IN ORDER TO PROVIDE CONTINUOUS FLOW OF FRESH POTABLE WATER FROM THE WTP DURING CONSTRUCTION, THE PROJECT WILL INVOLVE THE SEQUENTIAL DEMOLITION AND CONSTRUCTION OF EACH OF THE NEW PROPOSED FACILITIES. EACH ELEMENT OF DEMOLITION AND CONSTRUCTION HAS BEEN DESIGNED TO ENSURE APPROVED FIRE ACCESS ROADS AND WATER SUPPLIES CAN BE CONSISTENTLY MAINTAINED THROUGHOUT, IN COMPLIANCE WITH OFC 1410.1 AND 1412.1.
 - THE KNOX BOX WILL BE LOCATED NEAR THE FRONT DOOR OF EITHER THE EXISTING OPERATIONS BUILDING OR NEW ADMINISTRATION BUILDING. KNOX SWITCHES WILL BE INCORPORATED INTO EACH ELECTRICALLY ACTUATED ROLLING GATE, A "DAISY CHAIN" PAD LOCK WILL CONTROL ALL MANUAL GATES ON THE SITE, INCLUDING THE PROPOSED PIPE GATE AT MAPLETON DRIVE IN COMPLIANCE WITH OFC 506.
 - BUILDING NOMENCLATURE AND LETTERING WILL BE GENERATED IN ACCORDANCE WITH OFC 505.1. FOR EXAMPLE, BUILDINGS COULD BE SIGNED AS BUILDING A, BUILDING B, ETC. OR, THE APPLICANT COULD ERECT A BUILDING LOCATION MAP NEAR THE PRIMARY ENTRYWAY INTO THE OPERATIONS BUILDING. THE APPLICANT WILL WORK IN COLLABORATION WITH TVFR AND THE CITY OF WEST LINN TO CREATE AND INSTALL BUILDING ORIENTATION LABELING THAT BOTH MEETS TVFR REQUIREMENTS AS WELL AS WEST LINN LAND USE STANDARDS.
 - WITHIN BUILDING INTERIOR, FIRE PROTECTION EQUIPMENT SHALL BE INSTALLED CONSISTENT WITH OFC 510.1.
 - TVFR REQUESTS THAT THE APPLICANT PROVIDE A COMPLETED HMIS FOR REVIEW AND TENTATIVE APPROVAL AT THE TIME OF LAND USE APPLICATION. AS A CONDITION OF LAND USE APPROVAL, TVFR REQUESTS THAT THE APPLICANT PREPARE A HMMP, IF NECESSARY, DURING THE DESIGN PROCESS. TVFR REQUESTS THAT THE APPLICANT ENGAGE TVFR IN ONE OR MORE PARTNERING MEETINGS TO REVIEW THE TYPE, AMOUNT, LOCATION, STORAGE, CONTAINMENT AND TRANSPORT OF HAZARDOUS MATERIALS SO THAT THE SITE MAY BE DESIGNED TO BE AS SAFE AS IS REASONABLY PRACTICAL.
 - THE APPLICANT WILL PROVIDE TVFR WITH A FULL SET OF PRELIMINARY PLANS FOR REVIEW AND COMMENT DURING THE LAND USE APPLICATION PROCESS AND WILL PROVIDE THE TVFR WITH MORE DETAILED DESIGN DRAWINGS AND PLANS DURING THE SUBSEQUENT DESIGN PROCESS.

PLOT DATE: September 10, 2008 - 1:55PM USER: Mltac
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AT FULL SIZE
(IF NOT 2" - SCALE ACCORDINGLY)

DESIGNED: ####
DRAWN: ####
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CHECKED: ####
APPROVED: ####

REVISIONS				
REV.	DESCRIPTION	BY	DATE	APP.

OWNER:
CITY OF LAKE OSWEGO
380 A AVENUE
LAKE OSWEGO, OR 97034
PHONE: 503-635-0270



LAKE OSWEGO AND TIGARD WATER TREATMENT PLANT
DESIGN REVIEW AND CONDITIONAL USE
FIRE AND EMERGENCY ACCESS PLAN

FILENAME	
PROJECT NUMBER	
SCALE	1" = 50'
DRAWING/FIGURE NUMBER	FIG-5.13
#### OF	

Common/ Trade Name	Chemical Name, (Components & Concentration)	CAS Number	Physical State ¹	Maximum Quantity on Hand at any given time	Units	Days on Site	Storage Code (Type- Pres. - Temp.) ²
Existing Chemicals to Remain							
Powdered Activated Carbon	Carbon	7440-44-0	S	24,000	lbs.	365	J-1-4
Alum	Aluminum Sulfate	1043-01-3	L	12,000	gal.	365	G-1-4
Bleach (13%)	Sodium Hypochlorite	7681-52-9	L	12,000	gal.	365	C-1-4
Hydraulic Oil	Highly Refined Base Oils	64742-65-0	L	200	gal.	365	D-1-4
Waste Oil	Petroleum Hydrocarbon	64742-54-7	M	165	gal.	365	D-1-4
CO2	Carbon Dioxide	124-38-9	L	52,000	lbs.	365	A-2-6
Filter Aid Polymer	Nonionic Polyacrylamide	9003-05-8	S	150	lbs.	365	J-1-4
Propane	Propane	74-98-6	G	500	gal.	365	C-2-6
ACH/ PACl	Aluminum Chlorohydrate/ Polyaluminum Chloride	12042-91-0/ 1327-41-9	L	6,100	gal.	365	C-1-4
New Chemicals							
Ballasted Floc. Microsand	Silica Sand	14808-60-7	S	16,000	lbs.	365	J-1-4
CTS	Calcium Thiosulfate	10124-41-1	L	825	gal.	365	E-1-4
Caustic soda	Sodium Hydroxide	1310-73-2	L	12,000	gal.	365	C-1-4
LOX	Liquid Oxygen	7782-44-7	L	12,000	gal.	365	A-2-7
Ballasted Floc. (Polydyne Clarifloc 3230)	Cationic Polymer	69418-26-4	S	2,000	lbs.	365	J-1-4
Mech. Dewatering (Polydyne Clarifloc WE-137)	Liquid Emulsion Polymer	25987-30-8	L	250	lbs.	365	J-1-4
Thickener Polymer	Liquid Emulsion Polyacrylamide	9003-05-8	L	110	gal.	365	E-1-4

1: P = Pure, M = Mixture, S = Solid, G = Gas

2: **Type** - A = Aboveground tank, B = Belowground tank, C = Tank inside building, D = Steel drum, E = Plastic or nonmetallic drum, F = Can, G = Carboy
H = Silo, I = Fiber Drum, J = Bag, K = Box,

L = Cylinder, M = Glass Bottle or Jug, N = Plastic Bottles or Juges, O = Tote Bin, P = Tank Wagon, Q = Rail Car, R = Other

Pressure - 1 = Ambient (Atmospheric), 2 = Greater than Ambient (Atmospheric), 3 = Less than Ambient (Atmospheric)

Temperature - 4 = Ambient, 5 = Greater than Ambient, 6 = Less than Ambient, but not Cryogenic [Ambient to -150F], 7 = Cryogenic [Less than 150F]

