

Created by:

Brian Reynolds

breynolds@hungerfordterry.com

Application Brief

Vacuum Degasifier System for ASR2



Application:

Vacuum Degasifier

Oxygen Reduction

System Design:

Avg. Flow 950 GPM

Influent O² : 8mg/L Avg.

Effluent O² : 0.67mg/L Avg.

Date: 2/14/2020

Additional documentation:

Support reading material link
to H&T web site

www.Hungerfordterry.com

H&T supplies Vacuum Degasifier for Oxygen reduction in Aquifer Storage and Recovery System. (ASR)

Growing population, environmental demands and reliable seasonal water supply required unique plan to maximize drinking water supply. Aquifer Storage & Recovery was implemented as a solution, but natural formations of Arsenic created a unique challenge.

Arsenic Mobilization can occur in natural rock formations in the presence of oxidant such as chlorine or oxygen. It has been proven that arsenic mobilization in the aquifer matrix can be controlled when recharge water is maintained with reduced oxygen levels.

The city main water supply is provided by a local reservoir with the WTP capacity currently rated for 6MGD. A remote degasification system (ASR1) is employed in the city center but uses membrane technology which creates high O&M as well as cost challenges. A cost effective alternative technology of vacuum degasification system was identified as easier to operate and maintain.

The consulting engineer turned to Hungerford & Terry to provide a properly sized vacuum degasification tower to meet the demands.



WTP & Operational ASR2

Fig.1

Created by:

Brian Reynolds

breynolds@hungerfordterry.com

Vacuum Degasifier System for ASR2



Application:

Vacuum Degasifier

Oxygen Reduction

System Design:

Avg. Flow 950gpm

Influent O²: 8mg/L Avg.

Effluent O²: 0.67mg/L Avg.

Date: 2/14/2020

Additional documentation:

*Support reading material link
to H&T web site*

www.hungerfordterry.com

After thorough water quality analysis and effluent goals were identified, a properly sized single stage degasifier tower was designed. There were not only functional design decisions to be made, but due to the costal proximity, corrosion resistance and wind speed calculations needed to be considered.

For this reason Stainless Steel materials and more compact, lower profile packed media bed design was selected.



Vacuum Degasifier with I&C Building

Fig. 2

The operation of vacuum degasifiers employ “Henry’s law”, that states “the amount of dissolved gas in a liquid is proportional to its partial pressure”.

Placing a solution under reduced pressure, or vacuum, makes the dissolved gas less soluble.

Calculations to determine the “Htu” height of turn unit, and “Ntu” number of turns units in addition to the type of packing are key to tower design.

Uniform distribution of liquid across media is important to ensure maximum surface area contact allowing gas molecules to reach water droplet edge for removal.

Created by:

Brian Reynolds

breynolds@hungerfordterry.com

Vacuum Degasifier System for ASR2



Application:

Vacuum Degasifier

Oxygen Reduction

System Design:

Avg. Flow 950gpm

Influent O²: 8mg/L Avg.

Effluent O²: 0.67mg/L Avg.

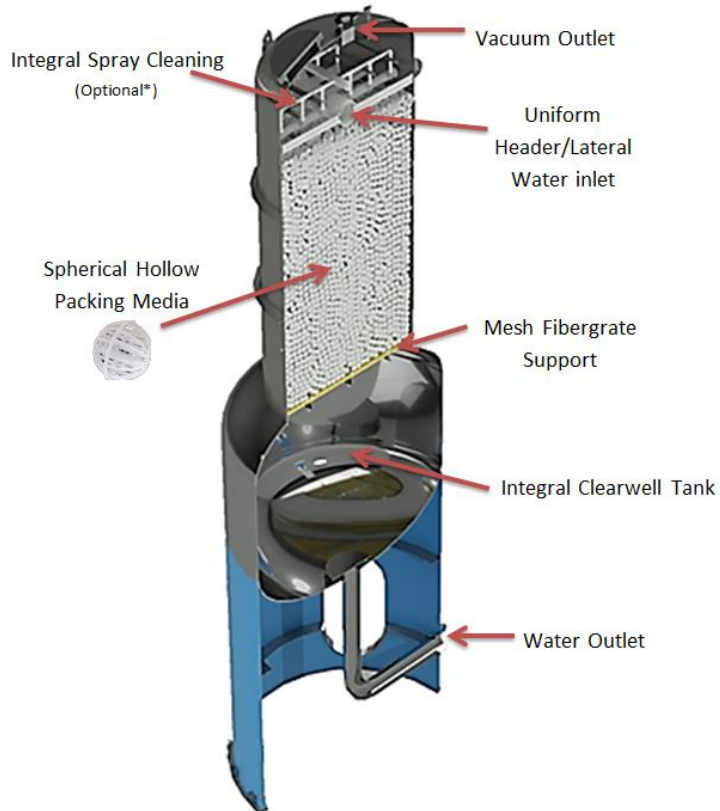
Date: 2/14/2020

Additional documentation:

Support reading material link
to H&T website.

www.hungerfordterry.com

Below you will find a cutaway of the design used for this application.



Vacuum Degasifier Internals

Fig.3

A Leader in Custom Built Water Treatment Systems.

Into the 21st Century Hungerford & Terry Inc. continues over 110yrs of water treatment solution that include Iron, Manganese, Arsenic, PFOS/PFAS, Radium, Nitrates, Hydrogen Sulfide, Perchlorate, Color, Hardness and other contaminants for Municipal, Industrial & Government facilities World Wide.