



# Aquatic Evaluation Report

Hood River Aquatic Center  
Hood River, Oregon

March 6, 2017

## Prepared For:

Hood River Valley Parks and Recreation District  
1601 May Avenue  
Hood River, OR 97031

## Prepared By:

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## *In Conjunction With:*

Opsis Architecture  
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Portland, OR 97209

## Executive Summary

WTI has been commissioned by the Hood River Valley Parks and Recreation to report on the current condition of the existing pool located at 1601 May Street. WTI visited the facility on January 25, 2017, toured the pool and related amenities, and met with staff to discuss operations. The enclosed report documents the observations from the site visit and outlines recommended capital and operational changes. Major components of the aquatic amenities have been given a score based on their observed condition, and these scores are weighted and aggregated to provide a total score. Below is a summary outline of the condition scores, recommendations and estimated capital costs.

The Total Aggregated Evaluation Score is shown below, and out of a possible high score of 100, is an indication of the condition of the aquatic amenities.

**Total Aggregated Evaluation Score: 44.84**

The condition of a facility is a major determination of the effort and cost of maintaining the utility and value of the amenities. A deteriorated facility will demand higher annual operating expenses over time as parts break, systems fail, finishes deteriorate, and structures weaken. There are also efficiencies lost when operating aging systems or equipment which are unable to take advantage of current methods and financially sustainable practices. The usable and efficient lifespan of the aquatic amenities is estimated below. After such time, the cost of operating the aquatic amenities is likely to exceed the amortized cost of recommended improvements.

**Probably Aquatic Lifespan: 3 to 5 years**

Below are the recommended repairs or replacements based on the observed condition of the aquatic components and the associated range of probable capital cost. A detailed description for each repair or replacement is included further in the report.

Replace All Valves and Mechanical Room Piping	\$90,000.00 to \$135,000.00
Replace Vacuum Sand Filter with Regenerative Media System	\$250,000.00 to \$325,000.00
Construct Surge Tanks	\$275,000.00 to \$375,000.00
Replace Pool Plaster Finish	\$80,000.00 to \$125,000.00
Replace Chemical Controllers	\$30,000.00 to \$55,000.00
Install UV Sanitation Systems	\$100,000.00 to \$175,000.00
<b>Total Recommended Repairs or Replacements</b>	<b>\$825,000.00 to \$1,190,000.00</b>

For comparison to the investment necessary to maintain the existing facility, the probable cost to construct new aquatic amenities of similar size is also provided below. This cost amount involves only the pool vessel, pool piping, and pool mechanical equipment, and does not account for site, building, or building mechanical components.

**Total Probable Cost of New Construction** **\$1,325,000.00 to \$1,775,000.00**

## Introduction

The purpose of this evaluation is to review the present condition of the aquatic amenities and aquatic mechanical systems at the existing Hood River Aquatic Center. The evaluation consists of visual examination of the pool(s) and associated mechanical equipment. The report outlines the present condition of the systems, equipment, and components and provides recommendations for repairs or replacements. Each recommendation is given an estimated range for the probable cost to construct, install, or perform the renovation or repair.

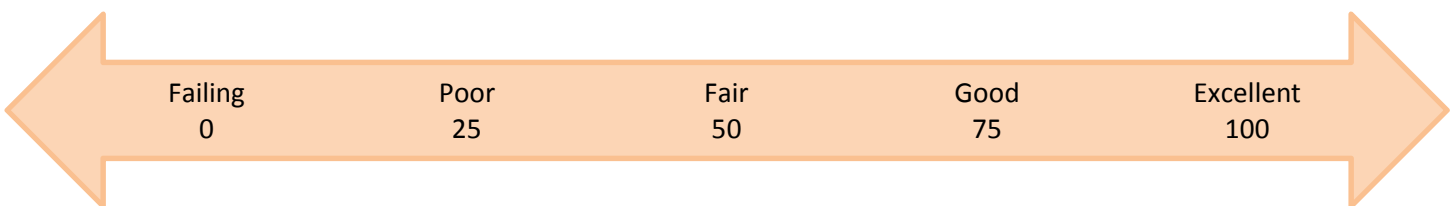
The aquatic center is a stand-alone aquatic facility serving the community of Hood River. The facility holds three pools, or bodies of water: main lap pool, therapy pool, and children's wading pool. The main lap pool is 25 yards by 25 meters, with approximately 6,150 ft<sup>2</sup> of water surface area, and 281,000 gallons of water. The therapy pool has an approximate water surface area of 1,130 ft<sup>2</sup> and a water volume of 30,000 gallons. Finally, the children's wading pool is approximately 300 ft<sup>2</sup> and holds 1,500 gallons of water.

All three pools are enclosed within a removable tension fabric supported on a metal structure. This type of enclosure allows year-round use of the pools and the ability to seasonally open part of the structure. Four of the tension fabric sections are removed on a seasonal basis. The pool has stainless steel gutters and aggregate plaster interior finishes. The main lap pool is filtered using a vacuum sand filter. The therapy pool and children's wading pool are filtered using pressure sand filters. All three pools are disinfected with a sodium hypochlorite, and pH is balanced using carbon dioxide. Pool water heat is provided with heat exchangers on the building boiler system.

## Methodology

WTI observed the condition of the aquatic elements at the facility. Aquatic elements include pool vessels, water features, pool filtration systems, pool circulation pumps, piping, valves and controls, and water treatment systems. Observations were conducted in a non-destructive manner and did not involve the removal of any structures or disassembly of any equipment.

Major components of the aquatic systems and structures are categorized in the report and scored based on their observed condition. The condition scores are weighted and aggregated to produce an overall evaluation score. Potential scores range from zero to one hundred, representing the condition descriptions below:



Total evaluation scores for each pool and aquatic amenities are compiled and weighted to create a total aggregated evaluation score. The total aggregated evaluation score provides an indication of the overall condition of the aquatic amenities of the facility.

Included in the report are observations and indications of the condition of the accessible means of pool entry and exit. WTI has endeavored to identify problems with the means of access and potential non-compliance with the Americans with Disabilities Act (ADA). Observations and evaluations included in this report do not constitute certification or verification of compliance with ADA requirements. ADA compliance is a legal opinion, and WTI is not able to anticipate or

guarantee judicial interpretation with respect to a facility's legal compliance. WTI recommendations are based on a current understanding of the technical requirements of ADA regulations on aquatic amenities.

Compliance with Virginia Graeme Baker Pool and Spa Safety Act (VGBA) regulations has not been verified or investigated as a part of this evaluation and report. Any statements regarding drains, suction fittings, or any other component pertaining to VGBA are preliminary observations only, and further inspection to substantiate compliance is necessary.

The cost amounts associated with the provided recommendations are the opinion of WTI based on a professional understanding of market conditions. Cost amounts have not been trade or contractor verified, and are intended to provide guidance for a preliminary aquatic budget.

# Main Lap Pool

Below are descriptions of the observations from the site visit for major components of the aquatic amenities. A ranking of the condition of each component is indicated with an associated score.

Observations	Condition Rank	Condition Score	Weight Value	Total Score
<b>Pool Vessel</b> Type/Style: Concrete Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Cracking</li> <li><input type="radio"/> Spalling</li> <li><input type="radio"/> Shifting/Movement</li> <li><input type="radio"/> Groundwater Infiltration</li> <li><input type="radio"/> Exposed Reinforcement</li> <li><input type="radio"/> Leaking/Water Loss</li> </ul>	Good	75	0.125	9.38
<b>Pool Finish</b> Type/Style: Special Aggregate Plaster Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Cracking</li> <li><input checked="" type="radio"/> Spalling</li> <li><input checked="" type="radio"/> Delamination</li> <li><input checked="" type="radio"/> Coarse/Rough Surface</li> <li><input type="radio"/> Softening/Dissolving</li> <li><input type="radio"/> Staining</li> </ul>	Failing	0	0.050	0.00
<b>Pool Gutter</b> Type/Style: Stainless Steel Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Broken Grating</li> <li><input type="radio"/> Insufficient Channeling/Flow</li> <li><input checked="" type="radio"/> Insufficient Rimflow</li> <li><input checked="" type="radio"/> Flooding/Insufficient Capacity</li> <li><input type="radio"/> Cracking</li> <li><input type="radio"/> Spalling</li> <li><input type="radio"/> Staining</li> <li><input type="radio"/> Excessive Noise</li> </ul>	Failing	0	0.100	0.00
<b>Pool Accessibility</b> Type/Style: Chairlift Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Not Operable Without Assistance</li> <li><input type="radio"/> Insufficient Capacity/Lifting Power</li> <li><input type="radio"/> Not Present at Time of Observation</li> </ul>	Good	75	0.050	3.75
<b>Pool Handrails</b> Type/Style: Stainless Steel Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Staining</li> <li><input type="radio"/> Corrosion</li> <li><input type="radio"/> Scale Formation</li> <li><input type="radio"/> Loose/Insecure</li> </ul>	Good	75	0.025	1.88
<b>Main Drains</b> Type/Style: Dual Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Missing/Broken Cover</li> <li><input type="radio"/> Unsafe Fitting Condition</li> </ul>	Good	75	0.050	3.75

<b>Return Inlets</b>	Good	75	0.025	1.88
Type/Style:	Wall Inlets			
Issues/Problems:	<input type="radio"/> Broken Fixture <input type="radio"/> Blocked/Non-Functioning			
<b>Piping</b>	Poor	25	0.050	1.25
Type/Style:	PVC			
Comments:	Brittle PVC found near connections indicates deteriorating material			
Issues/Problems:	<input type="radio"/> Leaking <input type="radio"/> Corrosion <input type="radio"/> Metal Components <input type="radio"/> Unnecessary Connections <input type="radio"/> Inefficient Routing			
<b>Filtration</b>	Poor	25	0.100	2.50
Type/Style:	Vacuum Sand			
Comments:	Vacuum sand filtration is an inefficient method of filtration in comparison to other modern methods. In addition, for proper functioning, the vacuum sand filter must periodically halt flow, which impacts circulation and turnover.			
Issues/Problems:	<input type="radio"/> High Operating Pressure <input type="radio"/> Low Operating Pressure <input type="radio"/> Clogs/Debris <input type="radio"/> Biological Growth <input type="radio"/> Insufficient Capacity <input type="radio"/> Insufficient Flow <input type="radio"/> Inoperable Valves <input type="radio"/> Leaking Tank			
<b>Circulation Pump</b>	Good	75	0.050	3.75
Type/Style:	Centrifugal Impeller			
Issues/Problems:	<input type="radio"/> Excessive Motor Heat <input type="radio"/> Excessive Motor Noise <input type="radio"/> Leaking <input type="radio"/> Corrosion <input type="radio"/> Insufficient Flow			
<b>Circulation Valves</b>	Failing	0	0.075	0.00
Type/Style:				
Issues/Problems:	<input type="radio"/> Inoperable - Closed <input checked="" type="radio"/> Inoperable - Open <input checked="" type="radio"/> Limited Flow Adjustment <input type="radio"/> Broken Handle <input type="radio"/> Corrosion <input type="radio"/> Leaking			
<b>Chemical Control</b>	Good	75	0.050	3.75
Type/Style:	Chemtrol ORP and pH Automatic Chemical Controller			
Issues/Problems:	<input type="radio"/> Inaccurate Disinfectant Readings <input type="radio"/> Control Flowswitch <input type="radio"/> Inaccurate pH Readings <input type="radio"/> Alerts			

<b>Chemical Storage and Safety</b>	Poor	25	0.050	1.25
Type/Style:	Detached Shed			
Comments:	Chemical containers co-mingled in general mechanical area			
Issues/Problems:	<input type="radio"/> Insufficient Fire Protection <input checked="" type="checkbox"/> Insufficient Spill Protection <input checked="" type="checkbox"/> Lack of Chemical Separation <input checked="" type="checkbox"/> Inoperable Air Evacuation <input type="radio"/> MSDS Not Present <input type="radio"/> Missing/Inoperable Eyewash Station <input type="radio"/> Leaking Containers (Liquids) <input type="radio"/> Missing Personal Protective Equipment <input type="radio"/> Spilled Containers (Powders/Solids) <input type="radio"/> Open Containers / Exposure to Fumes			
<b>Primary Disinfection</b>	Fair	50	0.050	2.50
Type/Style:	Sodium Hypochlorite			
Comments:	Numerous unsecured/unfastened flexible chemical lines			
Issues/Problems:	<input type="radio"/> Hazardous Injection Location <input type="radio"/> Leaking <input type="radio"/> Hazardous Conveyance Methods <input type="radio"/> Lack of Automation			
<b>Supplemental Disinfection</b>	None	0	0.050	0.00
Type/Style:	None			
<b>Chemical Balance</b>	Good	75	0.050	3.75
Type/Style:	Carbon Dioxide			
Issues/Problems:	<input type="radio"/> Hazardous Injection Location <input type="radio"/> Leaking <input type="radio"/> Hazardous Conveyance Methods <input type="radio"/> Lack of Automation			
<b>Pool Water Heating</b>	Good	75	0.050	3.75
Type/Style:	Building Boiler Heat Exchanger			
Issues/Problems:	<input type="radio"/> Corrosion <input type="radio"/> Insufficient Heat <input type="radio"/> Leaking			
<b>Total Pool Score</b>			<b>Weight</b>	<b>Score</b>
Main Lap Pool			1.00	43.13

# Therapy Pool

Below are descriptions of the observations from the site visit for major components of the aquatic amenities. A ranking of the condition of each component is indicated with an associated score.

Observations	Condition Rank	Condition Score	Weight Value	Total Score
<b>Pool Vessel</b> Type/Style: Concrete Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Cracking</li> <li><input type="radio"/> Spalling</li> <li><input type="radio"/> Shifting/Movement</li> <li><input type="radio"/> Groundwater Infiltration</li> <li><input type="radio"/> Exposed Reinforcement</li> <li><input type="radio"/> Leaking/Water Loss</li> </ul>	Good	75	0.125	9.38
<b>Pool Finish</b> Type/Style: Special Aggregate Plaster Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Cracking</li> <li><input checked="" type="radio"/> Spalling</li> <li><input checked="" type="radio"/> Delamination</li> <li><input checked="" type="radio"/> Coarse/Rough Surface</li> <li><input type="radio"/> Softening/Dissolving</li> <li><input type="radio"/> Staining</li> </ul>	Failing	0	0.050	0.00
<b>Pool Gutter</b> Type/Style: Stainless Steel Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Broken Grating</li> <li><input type="radio"/> Insufficient Channeling/Flow</li> <li><input checked="" type="radio"/> Insufficient Rimflow</li> <li><input checked="" type="radio"/> Flooding/Insufficient Capacity</li> <li><input type="radio"/> Cracking</li> <li><input type="radio"/> Spalling</li> <li><input type="radio"/> Staining</li> <li><input type="radio"/> Excessive Noise</li> </ul>	Failing	0	0.100	0.00
<b>Pool Accessibility</b> Type/Style: Chairlift Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Not Operable Without Assistance</li> <li><input type="radio"/> Insufficient Capacity/Lifting Power</li> <li><input type="radio"/> Not Present at Time of Observation</li> </ul>	Good	75	0.050	3.75
<b>Pool Handrails</b> Type/Style: Stainless Steel Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Staining</li> <li><input type="radio"/> Corrosion</li> <li><input type="radio"/> Scale Formation</li> <li><input type="radio"/> Loose/Insecure</li> </ul>	Good	75	0.025	1.88
<b>Main Drains</b> Type/Style: Dual Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Missing/Broken Cover</li> <li><input type="radio"/> Unsafe Fitting Condition</li> </ul>	Good	75	0.050	3.75



<b>Return Inlets</b>	Good	75	0.025	1.88
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Type/Style: Wall Inlets

Issues/Problems:

- Broken Fixture
- Blocked/Non-Functioning

<b>Piping</b>	Poor	25	0.050	1.25
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Type/Style: PVC

Comments: Brittle PVC near connections indicates deteriorating material

Issues/Problems:

- Leaking
- Corrosion
- Metal Components
- Unnecessary Connections
- Inefficient Routing

<b>Filtration</b>	Good	75	0.100	7.50
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Type/Style: Pressure High-Rate Sand

Issues/Problems:

- High Operating Pressure
- Low Operating Pressure
- Clogs/Debris
- Biological Growth
- Insufficient Capacity
- Insufficient Flow
- Inoperable Valves
- Leaking Tank

<b>Circulation Pump</b>	Good	75	0.050	3.75
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Type/Style: Centrifugal Impeller

Issues/Problems:

- Excessive Motor Heat
- Excessive Motor Noise
- Leaking
- Corrosion
- Insufficient Flow

<b>Circulation Valves</b>	Failing	0	0.075	0.00
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Type/Style:

Issues/Problems:

- Inoperable - Closed
- Inoperable - Open
- Limited Flow Adjustment
- Broken Handle
- Corrosion
- Leaking

<b>Chemical Control</b>	Good	75	0.050	3.75
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Type/Style: Chemtrol ORP and pH Automatic Chemical Controller

Issues/Problems:

- Inaccurate Disinfectant Readings
- Control Flowswitch
- Inaccurate pH Readings
- Alerts

<b>Chemical Storage and Safety</b>	Poor	25	0.050	1.25
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Type/Style: Detached Shed

Comments: Chemical containers co-mingled in general mechanical area

Issues/Problems:

- |  |  |
|--|--|
| <input type="radio"/> Insufficient Fire Protection           | <input checked="" type="radio"/> Insufficient Spill Protection |
| <input checked="" type="radio"/> Lack of Chemical Separation | <input checked="" type="radio"/> Inoperable Air Evacuation     |
| <input type="radio"/> MSDS Not Present                       | <input type="radio"/> Missing/Inoperable Eyewash Station       |
| <input type="radio"/> Leaking Containers (Liquids)           | <input type="radio"/> Missing Personal Protective Equipment    |
| <input type="radio"/> Spilled Containers (Powders/Solids)    | <input type="radio"/> Open Containers / Exposure to Fumes      |

<b>Primary Disinfection</b>	Fair	50	0.050	2.50
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Type/Style: Sodium Hypochlorite

Comments: Numerous unsecured/unfastened flexible chemical lines

Issues/Problems:

- |  |  |
|--|--|
| <input type="radio"/> Hazardous Injection Location | <input type="radio"/> Leaking            |
| <input type="radio"/> Hazardous Conveyance Methods | <input type="radio"/> Lack of Automation |

<b>Supplemental Disinfection</b>	Fair	50	0.050	2.50
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Type/Style: Chlor-King Ultraviolet

Issues/Problems:

- |  |  |
|--|--|
| <input type="radio"/> Broken Bulb          | <input type="radio"/> Broken Wiping Mechanism                |
| <input type="radio"/> Insufficient Voltage | <input checked="" type="radio"/> Lack of Downstream Strainer |

<b>Chemical Balance</b>	Good	75	0.050	3.75
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Type/Style: Carbon Dioxide

Issues/Problems:

- |  |  |
|--|--|
| <input type="radio"/> Hazardous Injection Location | <input type="radio"/> Leaking            |
| <input type="radio"/> Hazardous Conveyance Methods | <input type="radio"/> Lack of Automation |

<b>Pool Water Heating</b>	Good	75	0.050	3.75
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Type/Style: Building Boiler Heat Exchanger

Issues/Problems:

- |                                 |   |
|---------------------------------|---|
| <input type="radio"/> Corrosion | <input type="radio"/> Insufficient Heat |
| <input type="radio"/> Leaking   |   |

Total Pool Score	Weight	Score
Therapy Pool	1.00	50.63

# Wading Pool

Below are descriptions of the observations from the site visit for major components of the aquatic amenities. A ranking of the condition of each component is indicated with an associated score.

Observations	Condition Rank	Condition Score	Weight Value	Total Score
<b>Pool Vessel</b> Type/Style: Concrete Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Cracking</li> <li><input type="radio"/> Spalling</li> <li><input type="radio"/> Shifting/Movement</li> <li><input type="radio"/> Groundwater Infiltration</li> <li><input type="radio"/> Exposed Reinforcement</li> <li><input type="radio"/> Leaking/Water Loss</li> </ul>	Good	75	0.125	9.38
<b>Pool Finish</b> Type/Style: Special Aggregate Plaster Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Cracking</li> <li><input type="radio"/> Spalling</li> <li><input type="radio"/> Delamination</li> <li><input type="radio"/> Coarse/Rough Surface</li> <li><input type="radio"/> Softening/Dissolving</li> <li><input checked="" type="radio"/> Staining</li> </ul>	Poor	25	0.050	1.25
<b>Pool Gutter</b> Type/Style: Stainless Steel Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Broken Grating</li> <li><input type="radio"/> Insufficient Channeling/Flow</li> <li><input checked="" type="radio"/> Insufficient Rimflow</li> <li><input checked="" type="radio"/> Flooding/Insufficient Capacity</li> <li><input type="radio"/> Cracking</li> <li><input type="radio"/> Spalling</li> <li><input type="radio"/> Staining</li> <li><input type="radio"/> Excessive Noise</li> </ul>	Failing	0	0.100	0.00
<b>Main Drains</b> Type/Style: Dual Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Missing/Broken Cover</li> <li><input type="radio"/> Unsafe Fitting Condition</li> </ul>	Good	75	0.075	5.63
<b>Return Inlets</b> Type/Style: Wall Inlets Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Broken Fixture</li> <li><input type="radio"/> Blocked/Non-Functioning</li> </ul>	Good	75	0.050	3.75
<b>Piping</b> Type/Style: PVC Issues/Problems: <ul style="list-style-type: none"> <li><input type="radio"/> Leaking</li> <li><input type="radio"/> Corrosion</li> <li><input type="radio"/> Unnecessary Connections</li> <li><input type="radio"/> Inefficient Routing</li> </ul>	Poor	25	0.050	1.25

Metal Components

<b>Filtration</b>	Good	75	0.100	7.50
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Type/Style: Pressure High-Rate Sand

Issues/Problems:

- |   |   |
|---|---|
| <input type="radio"/> High Operating Pressure | <input type="radio"/> Insufficient Capacity |
| <input type="radio"/> Low Operating Pressure  | <input type="radio"/> Insufficient Flow     |
| <input type="radio"/> Clogs/Debris            | <input type="radio"/> Inoperable Valves     |
| <input type="radio"/> Biological Growth       | <input type="radio"/> Leaking Tank          |

<b>Circulation Pump</b>	Good	75	0.050	3.75
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Type/Style: Centrifugal Impeller

Issues/Problems:

- |   |   |
|---|---|
| <input type="radio"/> Excessive Motor Heat  | <input type="radio"/> Corrosion         |
| <input type="radio"/> Excessive Motor Noise | <input type="radio"/> Insufficient Flow |
| <input type="radio"/> Leaking               |   |

<b>Circulation Valves</b>	Failing	0	0.075	0.00
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Type/Style:

Issues/Problems:

- |  |                                     |
|--|-------------------------------------|
| <input type="radio"/> Inoperable - Closed                | <input type="radio"/> Broken Handle |
| <input checked="" type="radio"/> Inoperable - Open       | <input type="radio"/> Corrosion     |
| <input checked="" type="radio"/> Limited Flow Adjustment | <input type="radio"/> Leaking       |

<b>Chemical Control</b>	Good	75	0.050	3.75
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Type/Style: Chemtrol ORP and pH Automatic Chemical Controller

Issues/Problems:

- |  |  |
|--|--|
| <input type="radio"/> Inaccurate Disinfectant Readings | <input type="radio"/> Inaccurate pH Readings |
| <input type="radio"/> Control Flowswitch               | <input type="radio"/> Alerts                 |

<b>Chemical Storage and Safety</b>	Poor	25	0.050	1.25
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Type/Style: Detached Shed

Comments: Chemical containers co-mingled in general mechanical area

Issues/Problems:

- |  |  |
|--|--|
| <input type="radio"/> Insufficient Fire Protection           | <input checked="" type="radio"/> Insufficient Spill Protection |
| <input checked="" type="radio"/> Lack of Chemical Separation | <input checked="" type="radio"/> Inoperable Air Evacuation     |
| <input type="radio"/> MSDS Not Present                       | <input type="radio"/> Missing/Inoperable Eyewash Station       |
| <input type="radio"/> Leaking Containers (Liquids)           | <input type="radio"/> Missing Personal Protective Equipment    |
| <input type="radio"/> Spilled Containers (Powders/Solids)    | <input type="radio"/> Open Containers / Exposure to Fumes      |

<b>Primary Disinfection</b>	Fair	50	0.050	2.50
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Type/Style: Sodium Hypochlorite

Comments: Numerous unsecured/unfastened flexible chemical lines

Issues/Problems:

- |  |  |
|--|--|
| <input type="radio"/> Hazardous Injection Location | <input type="radio"/> Leaking            |
| <input type="radio"/> Hazardous Conveyance Methods | <input type="radio"/> Lack of Automation |

<b>Supplemental Disinfection</b>	Failing	0	0.075	0.00
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Type/Style: None

<b>Chemical Balance</b>	Good	75	0.050	3.75
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Type/Style: Carbon Dioxide

Issues/Problems:

- Hazardous Injection Location
- Leaking
- Hazardous Conveyance Methods
- Lack of Automation

<b>Pool Water Heating</b>	Good	75	0.050	3.75
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Type/Style: Building Boiler Heat Exchanger

Issues/Problems:

- Corrosion
- Insufficient Heat
- Leaking

<b>Total Pool Score</b>			<b>Weight</b>	<b>Score</b>
Wading Pool			1.00	47.50

<b>Observations - Total Evaluation Score</b>	<b>Total Pool Score</b>	<b>Weighted Value</b>	<b>Adjusted Score</b>
Main Lap Pool	43.13	0.75	32.34
Therapy Pool	50.63	0.20	10.13
Wading Pool	47.50	0.05	2.38
<b>Total Aggregated Evaluation Score</b>			<b>44.84</b>

## Recommendations

The following repairs or replacements are encouraged for immediate improvement of the aquatic center. These recommendations are needed, at a minimum, to allow the facility to operate more efficiently and effectively and provide a safe, healthy, and beneficial experience to facility users.

Aquatic amenities and components have been observed and considered for recommendations for improvement. Elements of the facility beyond the aquatic components, such as site, building, and building mechanical components, are excluded from the analysis of this report.

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### **Replace All Valves and Mechanical Room Piping**

**\$95,000.00 to \$135,000.00**

Staff reports circulation control valves are stuck in place and unable to be adjusted or closed. The adjustment of piping valves is crucial to the operation and maintenance of the pool and pool systems. Without the ability to adjust the circulation valves the flow of water is not able to be optimized and quality of water turnover could be impacted. Further, without the ability to fully close and open valves routine repairs and replacements of equipment and components of the pool systems becomes extremely difficult, and likely impossible without complete shutdown of the pool. All failing piping valves should be replaced with new butterfly circulation valves.

The mechanical room piping should be replaced at the time of valve replacement. Reports of increasing difficulty when tapping or modifying pool mechanical room piping is an indication of deterioration and a potential for future leaking issues.

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### **Replace Vacuum Sand Filter with Regenerative Media System**

**\$250,000.00 to \$325,000.00**

The current lap pool filtration system operates under the principle of pulling the pool water through a bed of sand. Small particles and debris are intended to be trapped and lodged in the small spaces and crevices between grains of sand. The circulation pump is located downstream from the filter; therefore, the bed of sand is on the vacuum side of the pump. This style of filtration is not capable of providing the flow rates of other more modern filtration systems in a comparable footprint in the mechanical room. This filter also requires a periodic halt in the flow of water through the filter, to provide an opportunity for the bed of sand to settle and avoid channeling and other problems. These factors combine to restrict the circulation system from achieving higher flow rates. Overtime as the system encounters problems, pumps grow inefficient, piping restrict flow with scale, or other factors reduce flow the system is more likely to fail to achieve the required turnover rate.

The main lap pool, with the largest volume of water in the facility, would benefit from the use of a regenerative media system. Regenerative media filters are located on the pressure side of the circulation pump and push water through perlite media. Perlite media is an excellent filtration material and can be commonly found in the beverage industry. The automated "bump" cycle of the system regenerates the used media to extend the lifespan of a media cycle. This process greatly reduces the amount water consumed to flush the system, and cost savings due to this lower water consumption are seen in water, chemical and heating expenses. Regenerative media filters typically represent a higher capital cost than sand filtration methods. Lower annual operating expenses offset these capital costs.

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### **Construct Surge Tanks**

**\$275,000.00 to \$375,000.00**

The function of pool perimeter gutters is one of the most important aspects of pool design. Gutters are intended to skim only the very top of the pool water from the rest of the pool. The majority of the contamination and unwanted material in a pool, such as body oils, greases and bacteria, reside at the surface of the water. Continuously removing this part of the water and sending it to the filtration and water treatment systems is crucial to maintaining a clean and healthy pool.

The current pool perimeter gutters are intended to be “surge” gutters. The function of this type of gutter is to skim the water surface and remove it from the rest of the pool, and to provide surge capacity for changes in the water level of the pool. There is little to no surge capacity in any other area of the pool systems. When numerous swimmers enter the pool or there is a highly dynamic activity in the pool, the gutters are flooded and do not function properly as a skimming mechanism or even a water removal system. Pool water traverses over the perimeter gutters and spills across the pool deck. The pool deck drains carry this water to waste, and the expense of chemical treatment and heating this water is wasted as well. Flooded pool gutters are a common occurrence at the facility and represents a non-functioning gutter system.

The three pool systems should operate with the capacity to hold enough surge water from high use in the pool to prevent the failure of the perimeter gutters. Construction of surge tanks will allow the water from the gutter to flow to a holding tank with enough excess volume to accommodate the usage of the pool at maximum capacity. These surge tanks will be regulated with automatic valves and prevent excess water from remaining in the gutters.

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### **Replace Pool Plaster Finish**

**\$80,000.00 to \$125,000.00**

The current pool aggregate plaster finish is badly deteriorated in all areas of the pool. The plaster is discolored, chipping, and spalling. Given the young age of the plaster, errors in application may be responsible for the current condition.

The plaster will continue to deteriorate over time. Aside from an unsightly appearance, chipping and cracking plaster may develop rough or sharp surfaces. Removal of the failing plaster and application of a new plaster finish is required to restore the pool to its proper condition.

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### **Replace Chemical Controllers**

**\$30,000.00 to \$55,000.00**

Staff reports difficulty maintaining some chemical levels, and, in particular, the system has been known to overfeed. This is indicative of issues is a lack of control of the chemical automation system. Responsiveness of the chemical control, or possibly accuracy of the chemical probes, is a likely concern. Further, staff would be greatly assisted with an improved ability to set alert levels and be notified remotely of high or low indicators, equipment failures, and other alarms. New chemical control units provide greatly enhanced features giving facility operators improved control over the function and monitoring of the pool water chemistry.

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### **Install UV Sanitation Systems**

**\$100,000.00 to \$175,000.00**

Currently only one of the three pool systems, the therapy pool, incorporates ultraviolet light as a supplementary sanitation method. Supplementary sanitation, a secondary method of disinfecting the pool water beyond maintaining a residual of chlorine in the water, is growing in importance. The resistance of bacteria and other pathogens to traditional disinfection methods is growing and a greater understanding of the contaminants in pool water is calling for secondary disinfection methods.

## Complete Pool Replacement

The previously discussed recommendations are necessary to maintain the aquatic components of the facility in proper working order. When a significant capital investment is considered for components of an asset, the cost to replace the complete asset is often a valuable comparative consideration. Therefore, an estimated range of probable construction cost for the replacement of the all pools and associated pool systems with newly constructed pool vessels, pool piping and pool mechanical systems is provided below. For cost purposes, newly constructed pool vessels are assumed to be of the same type and size as the existing pool vessels and are supported by modern filtration and water treatment systems.

<b>New 25-Yard by 25-Meter Competition Pool</b>	<b>\$920,000.00 to \$1,200,000.00</b>
<b>New Warm Water Therapy Wellness Pool</b>	<b>\$280,000.00 to \$400,000.00</b>
<b>New Children's Wading Pool</b>	<b>\$125,000.00 to \$175,000.00</b>
<b>Total Probable Cost of New Construction</b>	<b>\$1,325,000.00 to \$1,775,000.00</b>



Appendix:

**Site Observation Images**

collected on 1/25/2017









