

Lake Liner Replacement Design Playbook



Fountain Park Lake Liner Design



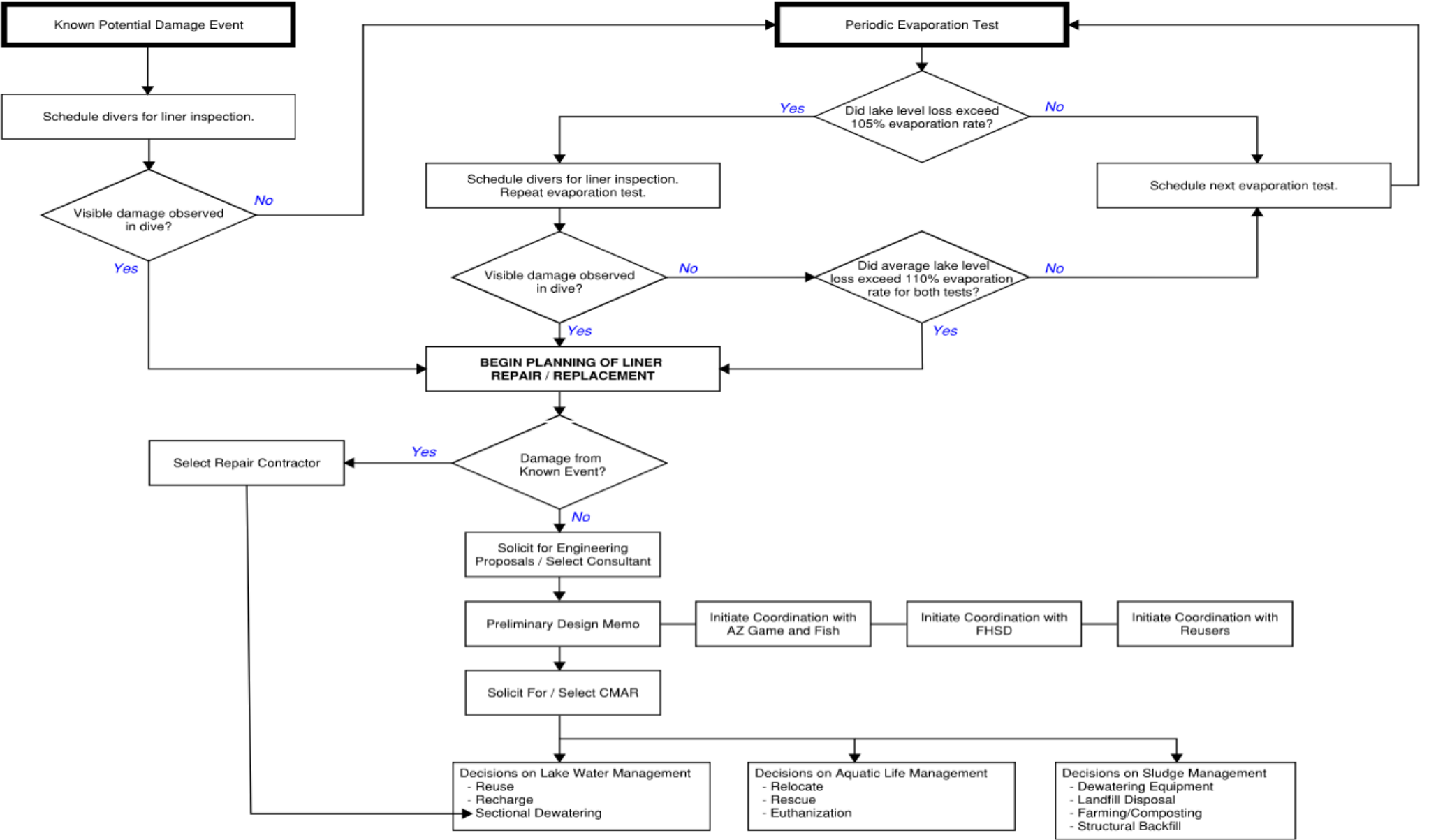
Better Planning Better Results



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Lake Liner Leak Flow Chart



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Leak Test



Evaporation Test Results

Once evaporation tests have indicated a lake loss greater than 110% of the pan evaporation, then it is recommended that planning begin for the liner replacement.

- To Date there has been zero indication of any lake liner outflow
- Repeat testing every 5 years

Repair Options

Inflatable Cofferdam

- Large geotextile tubes unfolded and filled with air and water
- This enables one section at a time to be completed
- Takes longer and is more difficult to install the liner



Repair Options

Aquaphor Recharge

The lake water stored by groundwater aquifer recharge and then recovered for later return to the lake.

- Pretreatment Filtration
- Pretreatment Disinfection
- Microfiltration Membranes to remove suspended solids
- Dechlorination and UV Disinfection to remove undesirable by-products
- Aquifer Storage and Recovery from Well



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Repair Options

Direct Reuse

- Alternative to trying to directly treat the lake water to a high level for aquifer recharge.
- Provide a balance between the lower TDS AWTF water and the higher TDS lake water
- Acceptable TDS concentrations for turf-grass irrigation is 200 ppm to 500 ppm.
 - TDS of the Lake reclaimed water has been measured to be over 1,180 ppm.

Aquatic Wildlife Removal

- Regulatory Requirements Arizona Administrative Code R12-4
- Arizona Game and Fish Department
- Identification of lake species
 - Transfer to a different lake
 - Rescue aquatic life by private organizations
 - Euthanizing and disposal of wildlife

Lake Sludge Disposal

Organic and inorganic solids accumulated in the lake must be removed, dewatered, and hauled away for disposal

- Air drying out solids not optimal



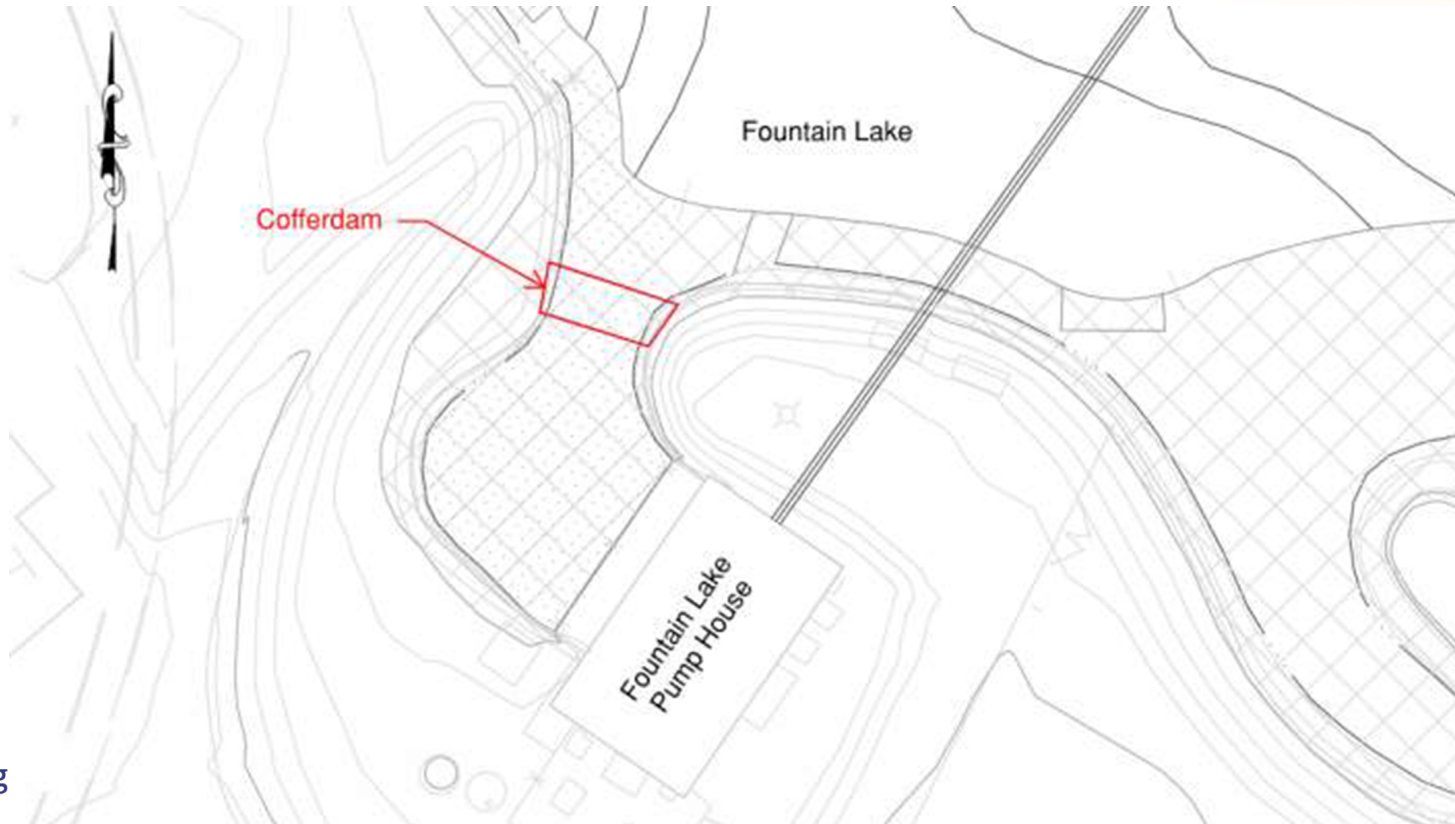
Mobile Belt Dewatering

Dewatering filtrate could be returned to the lake or a temporary storage area



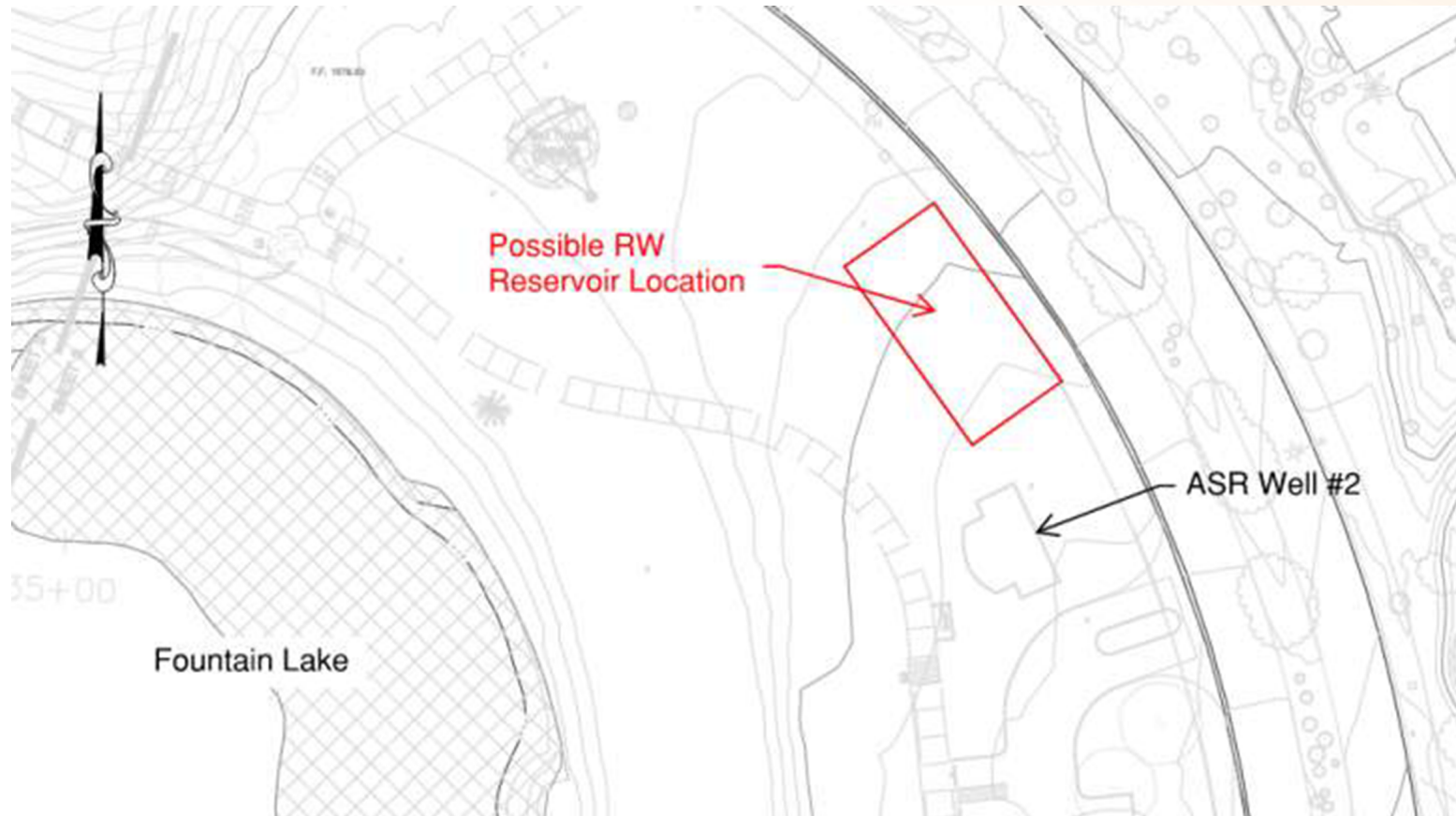
Park Vegetation Maintenance

- Cofferdam the pumphouse cove making 200,000 gallons of water available to irrigate



Park Vegetation Maintenance

- Dedicated Irrigation Storage of 500,000 gallon reservoir
 - 80 long x 40 wide x 21 depth



Review

- Failing to Plan is Planning to Fail
 - Emergency planning is costly
 - Proactive planning allows for scheduling replacement vs emergency replacement
- Water Evaporation Testing Until 110% is reached
 - No difference currently, existing liner could last 50+ years, 2050s
- Design Plan:
 - Aquatic Wildlife Removal
 - Removal of lake water
 - Sludge Disposal
 - Park Vegetation Maintenance
 - Liner Replacement
 - Refilling Lake



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Questions



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