

Ram Pump Detailed Task List

June 13, 2013

Summer 2013 - 6/13/13

Part I

Task List

1 Waste Valve

- Redesign valve to be: initially open, durable (made from metal), tunable. Research existing valve designs in commercial systems.
- Determine causes of opening and closing of valve

2 Stabelize Inlet Structure

- Add structure to drive pipe (triangle supports underneath?)
- Add weight/structure to tower (cinderblocks?)

3 Improve Connection to Needle Valve

- Find connectors for needle valve to the PVC pipe. Use the same size PVC?
- Investigate alternative valves.

4 Create Model Based on Physics Describing Pump Cycle

- Create MathCAD program based on analysis of system with inputs of drive height, delivery height, flow rate.
- Use this to determine the volume of gas in the air chamber so the change in pressure is relatively constant.

5 Air Chamber

- Make air tight.
- Test reduced sizes.

6 Research

- Water Hammer effect
- Comercial Ram Pumps
- Efficiency equations
- Call/email Clemson about their research

7 Documentation

- Create CAD drawings.
- Document experiments and results.

8 Testing

- Determine what variables can and should be monitored in the system
- Create methods for monitoring

Part II

Priorities

1. Stabilization.
2. Create airtight chamber.
3. Research of commerical systems, then move to redesign of valves.
4. Ongoing research for MathCAD model.