

# ***Deliverable G***

## ***Dream Team***

### ***(Group 8)***

#### ***GNG 1103 deliverable***

##### ***Abstract:***

This deliverable will be outlining the process of making prototype 2 and the results acquired by prototype 2. It will also contain the modified test plan for prototype 3 and an updated BOM for prototype 3.

##### ***Basic concept:***

This prototype is not the final version of prototype 2. This is due to the time constraint and not being able to acquire an arduino motor and 3D print a rod for the motor to connect to the blade. This prototype is used to test which material is the best to measure erosion and if water or a slurry mixture should be used. The modified prototype 2 will also be used to find any issues with the motor design for prototype 3 and change those designs.

##### ***Pictures:***







### ***Feedback:***

For our prototype we've received a few comments:

Firstly, one of the main points brought up was the ideal rpm ratio we would run our propeller at. After discussing with the group we'd like to test a wide variety of ranges from 50-500 rpm increasing in increments of 50 to determine an ideal set that doesn't create any problems.

Secondly, there was some question about our method of erosion. While we may not have it included in our second prototype we will be adding sand & salt inside our system. Paired with an upgraded larger surface area propeller the stress from the fragments would ideally cause accelerated erosion at our determined peak rpm range.



Thirdly, the simplicity of our design was a given up and down by certain critics. Some deemed our design much too simple whereas others deemed it to be a great idea. With this in mind we will improve the aesthetic of our design in terms of our container, the blade, the construction overall to make the system not seem too overly simple and almost unthoughtful.

### ***Updated BOM:***

### ***Test plan for prototype 2:***

Test ID	Objective	Description	Results	When
1	Continued testing of the propeller and motor	This test will be to make sure the propeller system established in the first prototype continues to work in the higher-fidelity system	The propeller system continues to work but modifications like keeping the motor level need to be modified	March 8th, 2024
2	Water Testing	This test will help the group decide what type of water to use in the final system. With that being a slurry mix, saltwater, or mineral water	A slurry mixture is more efficient than water as the sand particles making contact with the sample erode it faster and put it through harsher conditions	March 8th, 2024
3	Secondary Testing	This will be testing done on the smaller aspects of the design. Testing aspects like the thermometer, the filter, and the scale.	These aspects were not tested due to the limited amount of time	March 8th, 2024
4	Look for Flaws	This will just simply be looking for any flaws in the system, and making an effort to revert these flaws.	The only flaws were making the motor straight and the 3d propeller needing a design change	March 8th, 2024

### ***What to modify for prototype 3:***

For our third prototype our group will have a full functioning motor attached to our arduino board mounted into our water tank. Ideally we'd like to test our 3-d printed 3 spoke propeller but we may change the dimensions and add a larger surface area to each blade. On top of all this we'd begin to carry out our individual tests with regular water, and adding sand, salt into the water.

### ***Test plan for prototype 3:***

Test ID	Objective	Description	Results	When
1	Continued testing of the improved propeller and motor	This test will allow the group to make sure our improved propeller and arduino motor work as we have planned.	N/A	March 15th, 2024
2	Water Testing	This test will involve the testing of different water mixtures, be that a slurry or regular water.	N/A	March 15th, 2024
3	Secondary Testing	This will be testing done on the smaller aspects of the design. At this point this will most likely be the lid and system integrity.	N/A	March 15th, 2024
4	Look for Flaws	This will just simply be looking for any flaws in the system, and making an effort to revert these flaws.	N/A	March 15th, 2024

### ***Conclusion:***

In conclusion, prototype 2 did as expected. However there are some improvements that need to be made for the prototype III as mentioned.