

**Project Design Phase-I**  
**Proposed Solution Template**

Date	05-10-2022
Team ID	PNT2022TMID37146
Project Name	Efficient Water Quality Analysis & Prediction Using Machine Learning

**PROPOSED SOLUTION :**

S NO	PARAMETER	DESCRIPTION
1.	Problem Statement (Problem to be solved)	<ul style="list-style-type: none"><li>Water quality prediction using machine learning techniques. Our model predicts the drinkability of the water based parameters such as Ph value, conductivity, and hardness of the water,.</li></ul>
2.	Idea / Solution description	<ul style="list-style-type: none"><li>Water quality prediction model using the principal component analysis followed by decision tree classification.</li><li>Firstly, the water quality index (WQI) is calculated using the weighted arithmetic index method.</li><li>Secondly, the principal component analysis (PCA) is applied to the dataset, and the most dominant WQI parameters have been extracted.</li><li>Thirdly, to predict the WQI, different regression algorithms are used to the PCA output.</li><li>Finally, the decision tree classifier model is utilized to classify the water quality status.</li></ul>
3.	Novelty / Uniqueness	<ul style="list-style-type: none"><li>In this prediction, the main uniqueness is utilization of PCA and decision tree classifier model.</li></ul>

4.	Social Impact / Customer Satisfaction	<ul style="list-style-type: none"> <li>• This work can demonstrate how setting of more stringent water quality objectives can enhance and protect environmental assets of water resources.</li> <li>• This work can aid in justifying the range of water quality metrics set by government initiatives and to minimize further damages in water resources.</li> <li>• This work can help to quickly identify drinkability of water from new sources.</li> </ul>
5.	Business Model (Revenue Model)	<ul style="list-style-type: none"> <li>• For Analyzing the metrics of each water resource a charge of Rs 100 will be collected.</li> </ul>
6.	Scalability of the Solution	<ul style="list-style-type: none"> <li>• The solution is highly scalable as we use Machine learning technique .</li> <li>• A Automated system can be build to aid the government, to collect the water metrics and quickly analyze and predict the water quality.</li> </ul>