Final Year Project Showcase Batch 2021
Year 2024

	Department: Petroleum Engineering Programme: **Undergraduate**
1	**Project Title** Integrating Field Development Strategies: A Comprehensive Path from Exploration to Abandonment for Enhanced Recovery and Optimized Production.
2	**Project Idea** Blue Stone Field is a **partially developed oil reservoir** currently producing from five wells—Well 1 through Well 5. Over time, these wells have experienced a noticeable decline in reservoir pressure, leading to reduced production efficiency and diminishing recovery rates. This project aims to address those challenges by introducing a **dual solution**: first, optimizing the performance of the existing wells using Artificial lift method that is **continuous gas lift techniques** and aslo **Hydraulic Fracturing** in the formations having very low permeability to revitalize flow and enhance recovery; and **second, designing a new vertical well to tap into untapped zones of the reservoir**, expanding access to remaining hydrocarbons. Together, these approaches offer a comprehensive path to increase the **field's recovery factor,** sustain long-term production optimization that is the title of our project, and improve asset performance using smart engineering and targeted lift strategies.
3	**Process** 1. Exploration: Locate oil and gas using seismic and geological methods. 2. Drilling & Completion: Drill and prepare wells for production. 3. Production: Start production and monitor performance. 4. Enhanced Recovery: Apply artificial lift methods like gas lift to boost oil flow. In addition, optimization: Use data and monitoring to improve efficiency and reduce costs. 5. Abandonment: Safely plug and abandon wells at the end of their life**.** The process of Field development plan includes; 1. Hypothetical Box Model of Blue Stone Field. 2. Plan the reservoir surveillance on the existing wells. . By Using Production Logging Tool (PLT). . By Using Resistivity Saturation Tool (RST). 3. Remediable based on Surveillance results. . Acid wash and Chemical Wash due to low Production . Reperforation on existing wells due to scale deposition and low Production. 4. Make a New Vertical Well Plan. 5. Optimization Techniques . Gas Lift and Hydraulic Fracturing by using **Software: PIPESIM and PROSPER by SLB (Schlumberger).** . ESP recommendation on oil wells
4	**Outcome** 1. Reperforated the zones with high Hydrocarbon Saturation and lower Production. 2. Plan Water Shutoff Activity in high water cut zones.

	3. Use Continuous Gas Lift Technique on well with reservoir pressure drop that are well 2, and well 3. 4. Future Recommendation to drill horizontal well in high net pay thickness zones. 5. Design new well plan for Vertical well for Production Optimization by using **Software PIPESIM**
5	**Evidence (Theoretical Basis)** • For well 1, after Reperforation **Production rate of oil increases.** • For New Well, Oil Production Rate is **9393.5 stb/day** • For Well 2, from Continuous Gas Lift Oil Rate increases from **0 stb/day to 3500 stb/day.** The well was producing ***354.64*** **barrels of oil per day** with a low productivity index of 0.2. After hydraulic fracturing, the productivity index increased to 0.38264, and the oil production rate went up to **733.74 barrels per day**
6	**Impact on Sustainability of Urban Regions or SDG-11 "Sustainable Cities and Communities"** **Goal 11: Exploitation of** Field does not harm Cities and Communities reduce carbon production by using different techniques for enhanced production rather than developing new one.
7	**Competitive Advantage or Unique Selling Proposition**
a	**Attainment of any SDG:** **3 SDG's are achieved by this FYDP;** **Goal 9:** By using the different techniques for the exploitation of the partially developed field, designing new well plan and using artificial gas lift techniques that comes under umbrella of industry innovation and infrastructure**.** **Goal 11: Exploitation of** Field does not harm Cities and Communities reduce carbon production by using different techniques for enhanced production rather than developing new one. **Goal 12:** Giving new well Plan, performing Reservoir surveillance, and using artificial lift helped in enhanced recovery and production optimization that leads to Responsible Consumption and Production
b	**Environmental Aspect** 1. Our project focuses on optimizing gas injection rates, compressor selection, and PID control loops, which reduce unnecessary energy consumption. 2. Controlled gas lift systems reduce excess gas venting and flaring, a major contributor to GHG emissions. 3. Carbon Footprint reduction: By maximizing well productivity early through proactive lift design, you shorten the timeline to production, which lowers energy input per unit hydrocarbon. Fewer workovers and interventions mean less fuel consumption and fewer emissions across the field life.
c	**Cost Reduction of Existing Product** The project lowers production costs by using gas lift to maintain oil flow in low-pressure wells, reducing the need for workovers and avoiding downtime. It also extends well life and delays the need for new drilling, resulting in overall cost savings.

d	**Process Improvement which Leads to Superior Product or Cost Reduction, Efficiency Improvement of the Whole Process** The project improves efficiency by applying gas lift early to maintain production in low-pressure wells. It reduces downtime, minimizes workovers, and streamlines the process from exploration to abandonment	
e	**Expanding of Market share** Our FYDP offers a powerful blueprint for service and upstream companies aiming to grow their foothold in the oil and gas market—especially in **mature, complex, and partially developed reservoirs.** **Integrated Optimization Packages**: Combining gas lift design, PID controller automation, PIPESIM modeling, and Camco valve selection into one workflow allows firms to offer **complete field development planning**. These appeals to operators who want fast, data-driven deployment.	
f	**Capture New Market** **Our** project introduces a technically sound yet adaptive framework that is especially suited to **niche reservoirs and overlooked production environments**	
g	**Any Other Aspect (Please tag it like above options)** All these facilities, tools and technologies are used by SLB, we can have all services all the way from exploration to abandonment of the field sourced from SLB.	
8	**Target Market** **Oil & Gas Companies**: From national upstream companies to international giants. The project supports companies managing partially developed oil fields, where field exploitation including new well plan, Perform Reservoir Surveillance by using SLB tools like PLT and RST, and use Artificial Lift methods for production optimization of the oil field. It gives them a roadmap—from exploration to abandonment—tailored for optimized production and responsible recovery	
9	**Team Members** (Names along with email address	Rida Siddiqui PE-21013 (**Team Lead)** **rida.siddiqui2020@gmail.com ;** Imtiaz Hussain PE-21036 hussain4409520@cloud.neduet.edu.pk ; Hashir Ahmed PE-21037 Sheikhhashirahmed21@gmail.com
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11	**Video (If any)**	Nill

Pictures (If any)