AI and IAGEN Application Use Case
Adjusting Drilling Conditions in the Oil, Gas and Petroleum Industry Water in Vaca Muerta, Neuquén, Argentina

Classification of report deliverable 9: Adjustment of Drilling Conditions in the Oil, Gas and Water Industry in Vaca Muerta, Neuquén, Argentina":

Classification 1: By Main Resource

- Selected option: Oil (main), ÿ Gas (secondary), Water + energy (tertiary).
- Justification:

  The report is mainly focused on the optimization of the process of drilling to maximize the efficient and safe extraction of oil. The Gas is also a key resource mentioned explicitly, given that Vaca Muerta is a significant formation for both oil and gas. Water is mentioned in the operational context (drilling), but it is clearly secondary in terms of the main focus of the document.

Classification 2: By Activity within Vaca Muerta

- Selected option: Optimization of Production Processes
- Justification:

  The report focuses specifically on optimizing the conditions of drilling using IAGEN to reduce time, costs, improve the operational efficiency, and increase extraction safety and productivity hydrocarbons. The emphasis is clearly on continuous and dynamic operational improvement through automated and predictive systems.

Classification 3: Type of AI Technology Used

- Main selected option: 1ÿÿGenerative AI Models, 2ÿÿGenerative AI Algorithms Machine Learning, and 6ÿÿAI Platforms for Data Integration and Big Data
- Justification:

  The use of advanced Generative AI models (GANs, VAEs) for predictive simulations and operational scenario generation is explained in detail. It also explicitly mentions advanced machine learning algorithms such as deep neural networks (Deep Learning), GAN-LSTM, and specific predictive algorithms for drilling optimization.

  It also highlights the importance of real-time data integration. from IoT sensors and advanced Big Data platforms for the processing, analysis and immediate execution.

Classification 4: By Strategic Impact on the Industry

- Selected option: AI for Production and Quality Optimization Infrastructure
- Justification:

  The main strategic impact noted in the report is the increase considerable in operational efficiency, significant cost reduction, Minimization of non-productive times and improved safety operational. All this through predictive and dynamic adjustments, focused in maximizing drilling efficiency and productivity, which has a direct impact on the critical infrastructure of the energy sector in Vaca Dead.