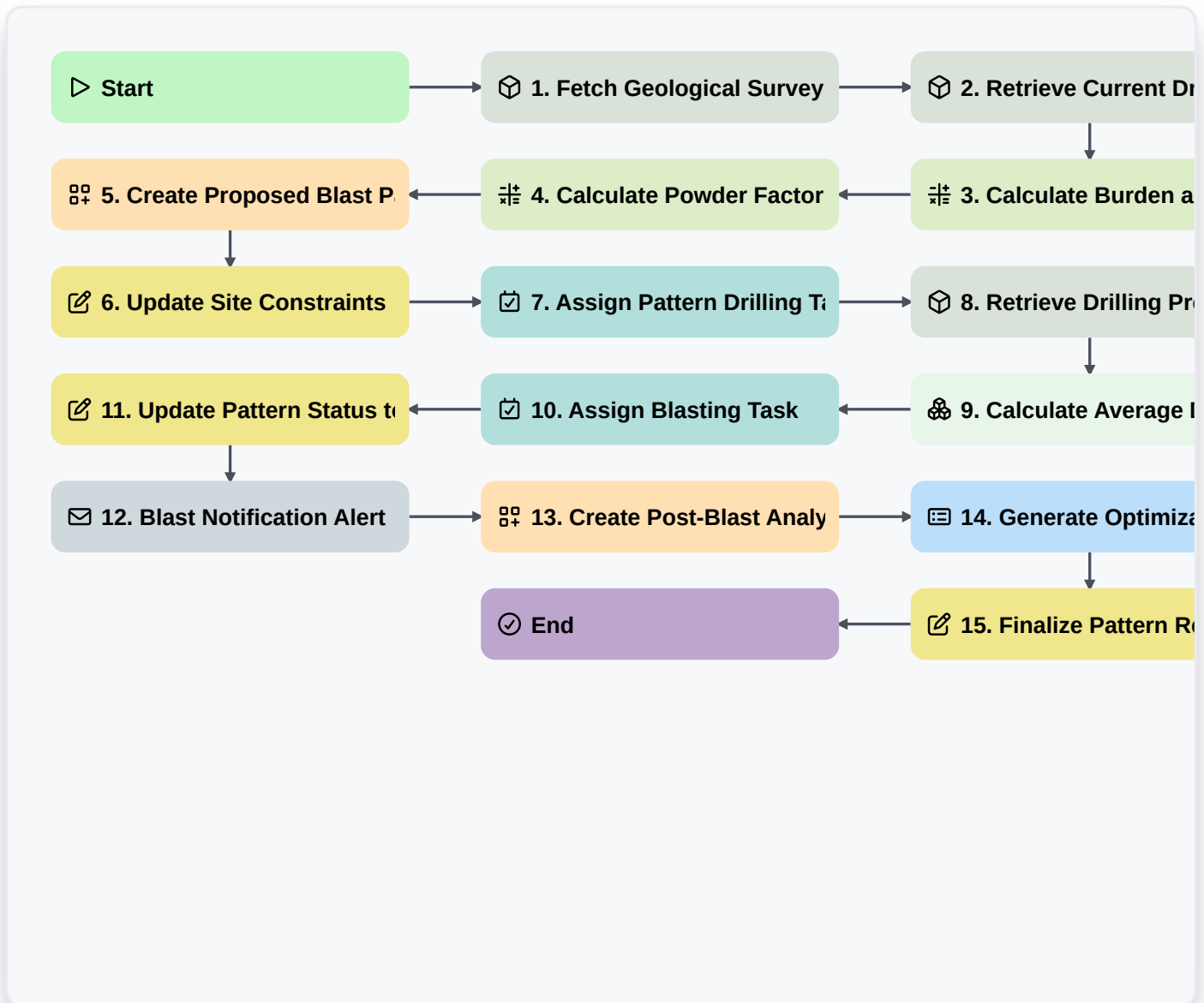


Drill And Blast Pattern Optimization



Start

Start of the Workflow/Process.

1. Fetch Geological Survey Data

Retrieve rock hardness, density, and fragmentation data from the Geological Survey data model.

2. Retrieve Current Drill Inventory

Get data regarding available drill bits, diameters, and machine availability.

3. Calculate Burden and Spacing

Apply formulas (e.g., Kuz-Ram model) using rock hardness and explosive energy to determine optimal burden and spacing.

4. Calculate Powder Factor

Calculate the required ratio of explosive mass to the volume of rock to be blasted.

5. Create Proposed Blast Pattern

Generate a new entry in the 'Blast Pattern' data model containing the calculated coordinates and hole depths.

6. Update Site Constraints

Update the blast site status to 'Pattern Designed' to prevent overlapping work orders.



7. Assign Pattern Drilling Task

Create a task for the Drill Operator to execute the pattern based on the new design.

8. Retrieve Drilling Progress

Get data from completed drill logs to verify actual vs. planned hole depths.

9. Calculate Average Deviation

Aggregate drilling logs to find the average deviation between planned and actual hole positions.

10. Assign Blasting Task

Create a task for the Blasting Engineer to supervise the loading of explosives.

11. Update Pattern Status to 'Loaded'

Update the Blast Pattern entry to reflect that explosives have been placed.

12. Blast Notification Alert

Send an email to the Site Safety Officer and nearby stakeholders regarding the upcoming blast window.

13. Create Post-Blast Analysis Entry

Create a new entry in the 'Post-Blast Evaluation' model to capture fragmentation and vibration results.

14. Generate Optimization Efficiency Report

Generate a report comparing the 'Planned Powder Factor' vs 'Actual Results' to refine future models.

15. Finalize Pattern Record

Update the original Blast Pattern entry to 'Completed' and archive it.

End

End of the Workflow/Process.