

Terrain Analysis for Optimal Pad Site Placement

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Summary

Determining a pad site location within a drilling unit can often be a challenging enterprise. Given that a pad site itself requires a flat level surface, imposing a flat plane across steep terrain can have unexpected grading consequences. In regions of great relief it is sometimes critical to determine the full grading footprint associated with a site location before proceeding with a design.

Using Global Mapper, technicians from Chesapeake Energy are able to conduct a detailed site analysis to determine the optimal situation and orientation of the prospective pad site.

Theory and/or Method

A high resolution, LiDAR-derived terrain model forms the basis of the analysis procedure. Precise volumetric calculations are first used to determine the optimal rotation angle for the pad site around the defined well location. These calculations also determine the breakeven height for the site so that cut and fill volumes are equalized, significantly reducing engineering costs. The volumetric calculations include slope and terrace specifications to ensure stabilization of the site. Finally a modified terrain surface is generated allowing an accurate 3D visualization of the proposed site plan.

Conclusions

Optimized location assessment and pre-construction site planning saves time and money in the well pad placement process. Developers can quickly determine if a proposed site encroaches into an adjoining property and can gauge the likely environmental impact of a site layout. Engineering specifications can be accurately calculated before committing resources to the project.

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