Proactive Management of Diluent Blending Can Deliver Big Cash Benefits for SAGD Operators

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In a world of lower for longer oil prices and disadvantaged product netbacks, SAGD producers need every resource available to them. Proactive diluent management presents a low capex option to maximize cash flow.

SAGD projects are designed to use either condensate or synthetic crude as diluent to produce either dilbit or synbit to meet pipeline specifications. The type of diluent used and how accurately it is blended can have huge financial impacts: there can be up to a two-fold difference in bitumen netbacks based on the blend product and the operational control of the blending.

Companies that take an integrated and proactive approach to blending can realize significant cash benefits while mitigating operational risk. In fact, effective diluent management can often deliver bigger cash benefits than increased production, and can be the difference between positive and negative cash flow in the current price environment. While there are some technical considerations, by far the bigger and more difficult aspects of achieving this are operational and organizational.

Over the years, SAGD operators may have considered the decision between condensate and synthetic to be a static one—after all, it is largely baked into their operations based on the pipeline diluent source and blending configuration. However, in this environment operators should challenge past decisions and be open to a more dynamic approach. There are a number of reasons for this.

First, there may now be other options to transport diluent to each plant. When one considers new pipelines, batching, trucking or rail, there may be more flexibility in the diluent source than originally thought.

Second, there could be options for synthetic diluent operators to move to a hybrid blend and “dil the dil”, i.e., cut the synthetic with a portion of condensate. This is particularly advantageous if the plant process has limitations with the lighter condensate.

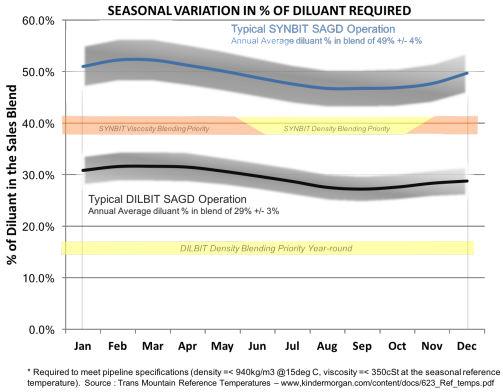
Third, there are huge cash advantages to be won by making sure not to give away product through over-blending by precisely matching the pipeline specification—a specification that is dynamic depending on the time of year and the type of diluent.

Fourth, managing risk and ensuring the security of diluent supply is critical to production and prices. Some operators have had to reduce production by as much as 40 per cent due to diluent supply disruption. Even the

threat of interruptions can result in demand-driven price spikes eroding bitumen netbacks. If one source of diluent is disrupted, a proactive approach allows better mitigation of production impact. This is not typically something that can be done on short notice — the technical and organizational work needs to have been done beforehand.

All of this is amplified by significant market fluctuations in the differentials. It is not as simple as the WTI to WCS differential, which gets the most attention. WTI-dilbit, WTI-synbit and condensate-synthetic prices all impact whether synbit or dilbit is the right choice in the short or medium term. Proactively considering the range of possible commercial scenarios and operational alternatives will lead to higher margins. Flexible and effective blending management potentially has more impact than pulling the traditional production improvement and operating cost levers. It requires the skills and muscle that allow an integrated approach, flexible quick reaction with great execution.

As shown in Figure 1, pipeline blending specifications vary seasonally, impacting the target blend rate. This variation is more pronounced for synbit than it is for dilbit, due to the fact that for synthetic blends, the controlling pipeline standard shifts from density in the summer months to viscosity in the winter, while dilbit is density blending year-round. The target blend rate can change as often as every two weeks, requiring very tight control to meet optimium blend rates.



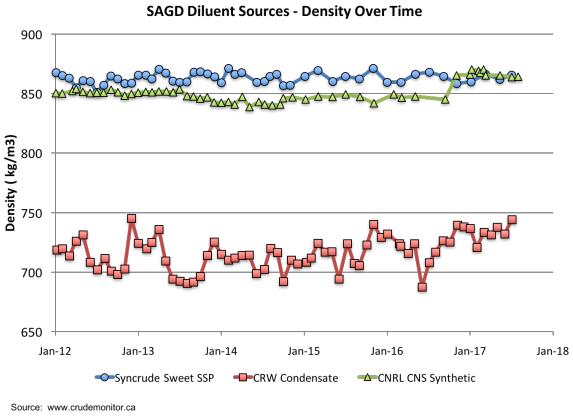
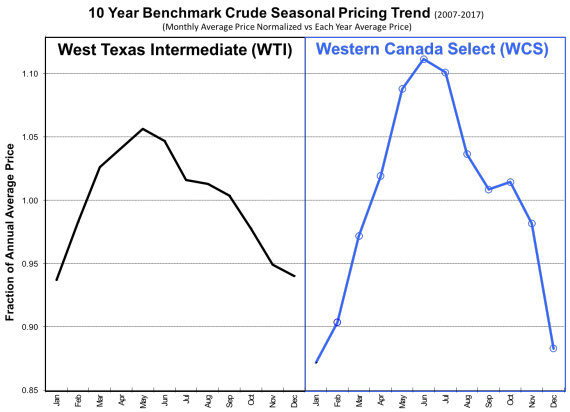


Figure 2 shows the variation over the past five years in the density of diluent sources. This variation adds another layer of complexity to achieving optimum blend rates, as neither the target blend rate nor the diluent density are constant.

Figure 3 shows the adjusted seasonal price variation of WTI and WCS. As can be seen from this graph, the seasonal price variation for WCS is significantly more pronounced than that of WTI. This price variation further compounds the netback impacts of the blending approach.



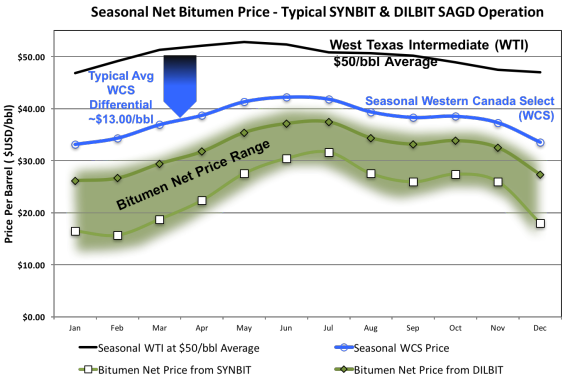


Figure 4 shows the resulting net bitumen price range throughout a year for a typical synbit vs dilbit SAGD operation, taking into account the seasonal bitumen blend rate and seasonal variation in WCS. The potential impact on the SAGD producer is enormous. The seasonal variation for bitumen net prices when producing synbit can be ~100% versus ~50% for dilbit.

So how do operators turn blending into a source of cash (and avoid it being a cash drain)? There are aspects of this that need to be resolved through technical work to address some key questions:

- What is the best theoretical blend rate for each type of diluent for each day of the year?
- What level of condensate can be tolerated to blend with the diluent?
- How much alternative diluent or condensate can be handled at site, especially if it has to come by rail or shipping, and are there medium term pipeline options?

These technical issues are actually the more straightforward pieces of the puzzle. The more challenging aspects are operational and organizational. It is through these operational excellence and organizational effectiveness approaches that companies can really unlock the blending cash box.

Commercial integration. In refinery operations, the commercial organization determines the best product mix and crude slate the operation will run, usually on a monthly basis. Similarly, SAGD operators need to review their management systems to ensure that operations and the commercial organization are fully integrated and that people are looking at the appropriate time horizons. Not everyone needs to focus on what production was yesterday.

An effective commercial organization can look at futures pricing to determine optimal diluent composition on a periodic basis. Coupling this with a joint commercial and operational view for the potential risks to supply and sales is critical. It is also important to consider density of individual diluent streams as data show that density has been creeping up over time, thereby impacting target diluent rates. This requires clear roles and responsibilities and an effective data-driven decision-making framework.

Blending short interval control. Blending needs to be managed very tightly with clear daily target parameters. This requires visibility of daily blending targets, measurement of actual versus target, trim blending to ensure the appropriate spec, and ongoing continuous improvement through data review and root causes analysis.

Process plant control. It is very difficult to achieve this blending control if the plant has not achieved a repeatable and predictable level of performance. Minimizing unplanned outages through more effective maintenance, clarifying process plant parameters and reducing shift-to-shift variability are all necessary enablers of an effective blending operation that can keep blending to tight specifications.

Leadership and performance management. It is critical that leadership create visibility of profitability and cash flow so that people in the organization can understand the implications of their actions. It is critical that leaders help people making the operational decisions understand what the primary targets are and how they

impact them. It is also important for leaders to build confidence and remove fear of failure so that as operations become more stable, people feel more comfortable working to tighter tolerances.

SAGD operations are inherently low margin and all the levers need to be pulled to continually improve profitability — including blending management.

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