

Urban Planning in Northern Part of Kuwait: Collaborating Through Synergy Across Assets to Optimize Development*

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Abstract

Northern part of Kuwait is a highly active development area for deeper gas, intermediate-depth conventional oil and shallow heavy oil. All these developments have overlapping footprints in an already congested area, requiring different development concepts- viz. gas, water flood, steam respectively. Additionally, different Assets manage them. Urban Planning therefore becomes a vital requirement for realizing all concurrent future developments regarding land use and necessitating close collaboration to leverage synergy among the Assets, utilizing both organizational and new technology-based solutions, to maximize value for Kuwait Oil Company (KOC). Urban Planning is a joint effort between KOC and Shell, with initial focus on establishing an agreement for work methods, effective communications, and protocols with all stakeholders. Next all “as-built” infrastructure and current plans were combined and reviewed. This formed the basis to identify and resolve conflicts, recognize opportunities for reduced land requirements and optimize the development synergies. The approach is underpinned with new technologies, tools, best practices, and concepts like multi-well pad developments, area discounting, exclusion zones, and shared flow line and access corridors, based on global analogue developments. Three fields requiring significant urban planning focus to avoid conflicts and enable synergies were identified. In field “A”, the shallow heavy-oil development requires large number of wells in a dense well-spacing versus wells targeting the deeper gas development, which requires large “safety zones” around well sites. In fields “B” and “C”, the intermediate-depth conventional oil reservoirs require significant infill drilling, along with water injection versus the deeper gas development, again needing large “safety zones” around the well sites. In both cases, common infrastructure like roads, electrical installation, flow line and trunk line corridors also need to be considered jointly.

Urban Planning collaboration between assets with distinct development challenges can help creating safe co-development opportunities, thus maximizing value for KOC. Acknowledgements: The authors would like to acknowledge the colleagues of the NKHO organization, both Shell and KOC for the joint effort towards building an effective development organization.



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Urban Planning in Northern part of Kuwait, Collaborating through Synergy across Assets to Optimize Development

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Agenda

- Introduction
- History
- Urban Planning (Start up – definition)
- Protocol
- Tools – software
- Results
- Questions



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Introduction

- North Kuwait is a highly active development area.
- Different assets are working with different targets.
- Technologies used to enhance production differ upon nature of the reservoir and feasibility.
- Implementation of current and future activities require proper land use.
- One field was selected within NK as a case study to apply new methodology.



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History

- The process that was used earlier created conflicts between assets.
- The previous process didn't meet expectations due to:
 1. Lack of communications.
 2. Unavailability of shared data base.
 3. Bypass the process.
 4. Dedicated manpower.
- Several conflicts resulted:
 1. Approved location for different activities.
 2. Randomness in laying down flow lines.
 3. Approve land reservation without considering other future development plans.



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Urban Planning

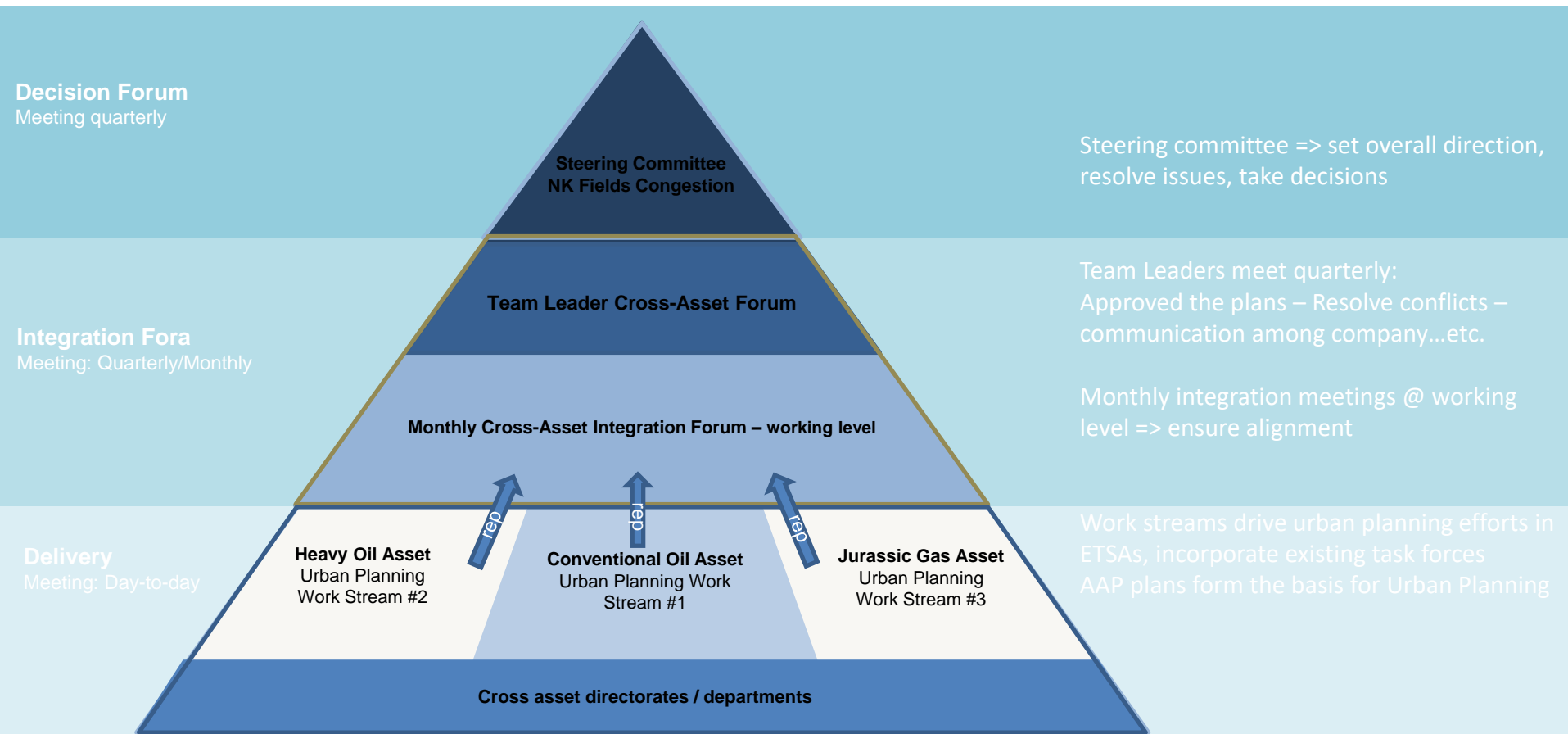
- Urban planning is a new concept introduced to KOC by SHELL.
- Under each Group, Urban Planning work stream established.
- TFT Integration meetings and discussions going between all stakeholders to establish agreed ways of working, effective communications and protocols.
- Integration work has been done starting by combining and reviewing as-built maps.
- Shared solid 5 years development plan.
- Create accessible/shared Master data base.
- Review the previous land reservation process looking for improvement.



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Protocol





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Protocol

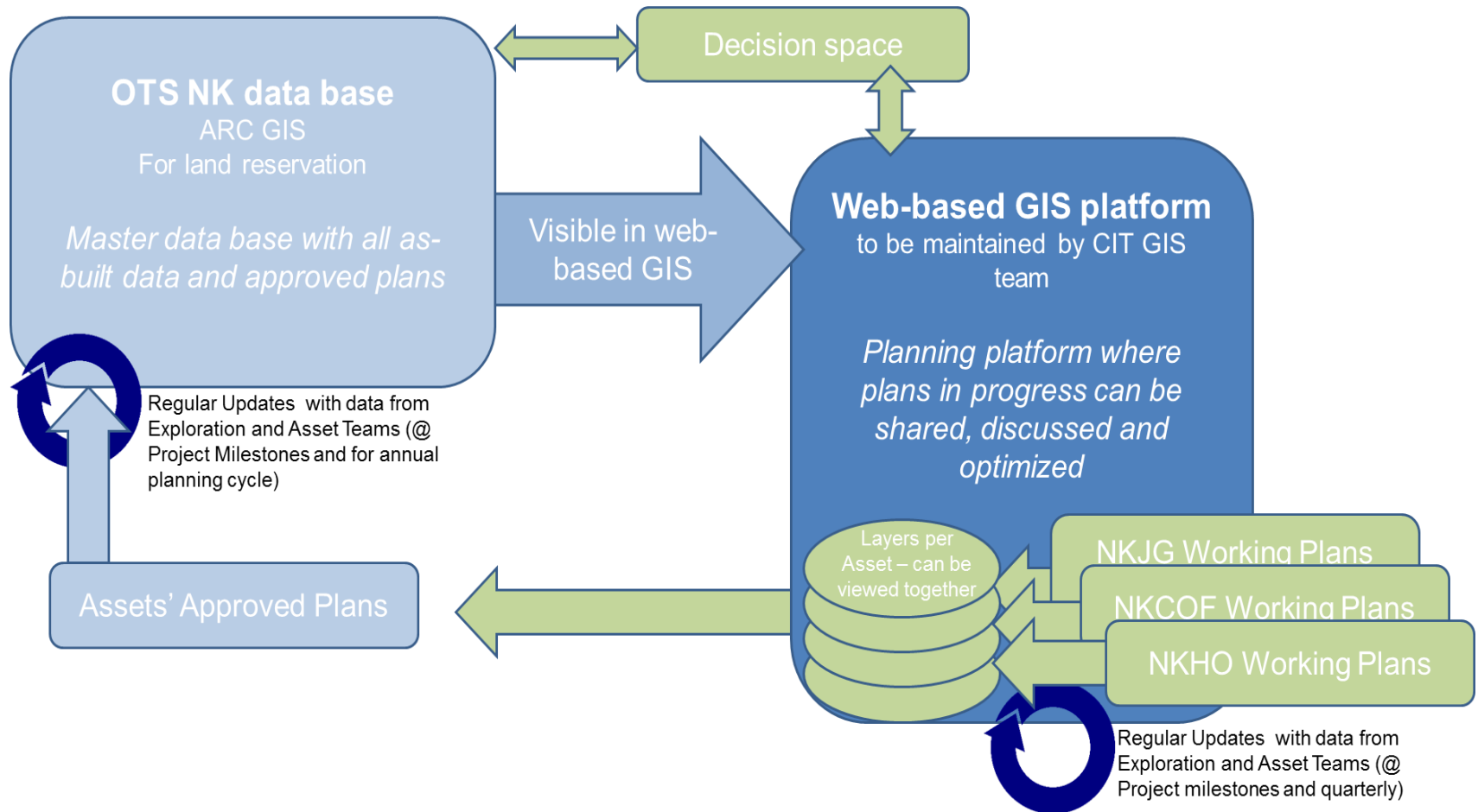
- Introduce land-reservation protocol for NK for outside Assets - e.g. Exploration, KPC, Local Relations.
- Raise all land-reservation requests through focal point.
- Focal point to relay the requests to all Asset Focal Point in Integration Forum.
- Well-spacing, exclusion zones and optimize SIMOPS coordination.
- Optimize facilities lay out, e.g. flow line corridors, combined utilities, optimize synergies (e.g. water balance, power demand).
- Agree on timelines when all Assets update & share their Urban Plans, based on AAPs.



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Tools – software



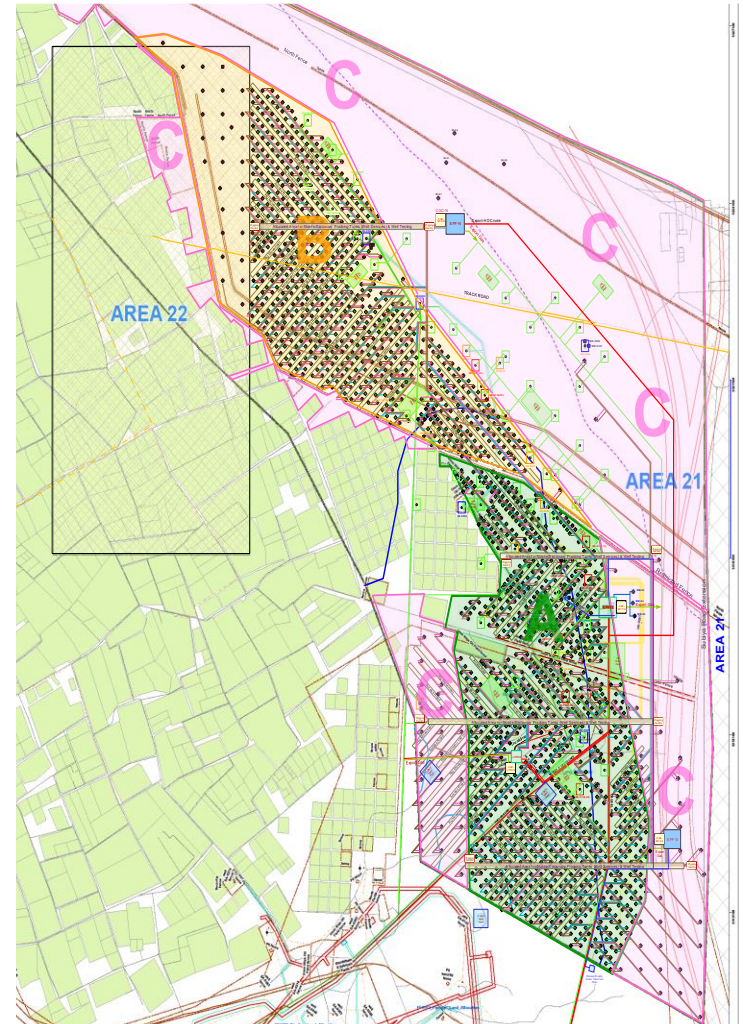


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Results

- Full Infrastructure master Plan concept has been developed.
- Wells, Pads and Facilities locations.
- Flow lines Corridors.
- Road & Rig access.
- Existing clashes will be rerouted gradually.
- In the first three years there will be flexibility in the design.
- Initial implementation already started.





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THANKS FOR LISTENING – ANY QUESTIONS?

