

## UNCONVENTIONAL GAS DEVELOPMENT STAGES

### ***Stage 1 - Resource Identification***

Companies pursuing unconventional gas opportunities, generally conduct research in the area where the gas is thought to occur. They may review and analyse historical geological reports, geophysical survey data, well logs and core samples. These records may be obtained from provincial agencies and industry data service companies. The OGC maintains a record of well logs, reports and core samples of all wells drilled in the Province. Coal records are available from the Ministry of Energy, Mines and Petroleum Resources (MEMPR) for companies interested in Coal bed gas.

Earlier projects in the area may not have proceeded due to the limitations of the technology of the day or may not have been economically viable based on the prevailing economic climate.

Companies may also conduct regional geological and geophysical surveys to determine the extent of the area prospective for natural gas. If the results of the analysis and initial exploration are encouraging, the company will proceed to the next stage of acquiring tenure.

### ***Stage 2 - Tenure Acquisition***

Before the OGC will grant approval to drill a well, a company must hold the petroleum and natural gas (P&NG) rights to the area. The BC Oil and Gas Commission does not issue tenure. The majority of P&NG rights in B.C. are owned by the Province and managed by MEMPR. The ministry holds monthly auctions of parcels of P&NG rights.

The proposed tenure parcels are reviewed and referred to First Nations, local governments and other government agencies for comments that may be attached to the parcels as conditions limiting or restricting access. A small amount of P&NG rights in B.C. are owned by the Federal government or are privately owned.

### ***Stage 3 – Initial Drilling and Testing Program***

Once a company has acquired petroleum and natural gas tenure, it may proceed to the next step, which is to apply for approval to explore for natural gas. In this phase, a company may:

- Conduct more specific geophysical exploration to determine a drilling location suitable to maximize resource development
- Design the initial project drawing on scientific and community knowledge to minimize potential impacts to other land users and the environment
- Conduct public and stakeholder engagement
- Conduct First Nations community engagement
- Negotiate access agreements with land owners if private land access is required
- Complete and evaluate initial well or wells
- Apply for project approval.

The OGC reviews existing land use plans to guide its decisions.

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Based on the results of the drilling the company will decide whether to move on to the pilot project feasibility stage (Stage 4). Should the results of the drilling be unsatisfactory, the company will reclaim and restore any well sites to meet regulatory requirements and government standards.

### ***Stage 4 – Multi-well (Pilot) Drilling and Testing***

If the evaluation stage indicates that there is sufficient resource to pursue, companies will consider following up with a small-scale project to test the feasibility of the development. Companies must discuss an expanded program with the public, First Nations and stakeholders and will undertake the following:

- Update project design and develop additional measures to mitigate potential impacts to land users and the environment
- Continue public and stakeholders engagement
- Continue First Nations' community engagement
- Negotiate additional or expanded access agreements with land owners as necessary
- Update any project scheme approvals and well authorization(s)
- Drill, complete and test wells and construct pipelines.

The OGC will review existing land use plans to guide its decisions and may participate in the development of landscape level plans for the development area with First Nations, other agencies and stakeholders, depending on the projected level of activity in the area and known sensitive issues.

Based on the pilot results the company will decide whether to move on to the production stage (Stage 5). Should it be determined that production is not feasible, all wells and related improvements will be restored and the sites reclaimed to meet regulatory requirements and government standards (see fact sheet #19).

### ***Stage 5 - Commercial Drilling and Production***

If the potential for commercial production is proven through the pilot project stage, a company can make an application to the OGC for Good Engineering Practice (GEP) under section 101 of the Drilling and Production Regulation). In this phase a company will:

- Continue to update project design and measures to mitigate potential impacts to land users and the environment;
- Continue to ensure public and stakeholders involvement when required;
- Continue to ensure First Nations' involvement when required;
- Apply for a Production Plan and additional well site and pipeline permits;
- Develop compression facilities and pipelines;
- Market the natural gas

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- Work with OGC Resource Conservation branch staff to insure the gas is produce efficiently and effectively, optimizing the full utility and return of the resource. Full return ensures the Crown receives maximum value through royalties.

### Stage 6 - Program End

At the end of the lifecycle of the project after maximum natural gas has been recovered, which may be more than 10–40 years hence depending on the nature and magnitude of the development, the site and all improvements will be reclaimed and restored to meet regulatory requirements and government standards.

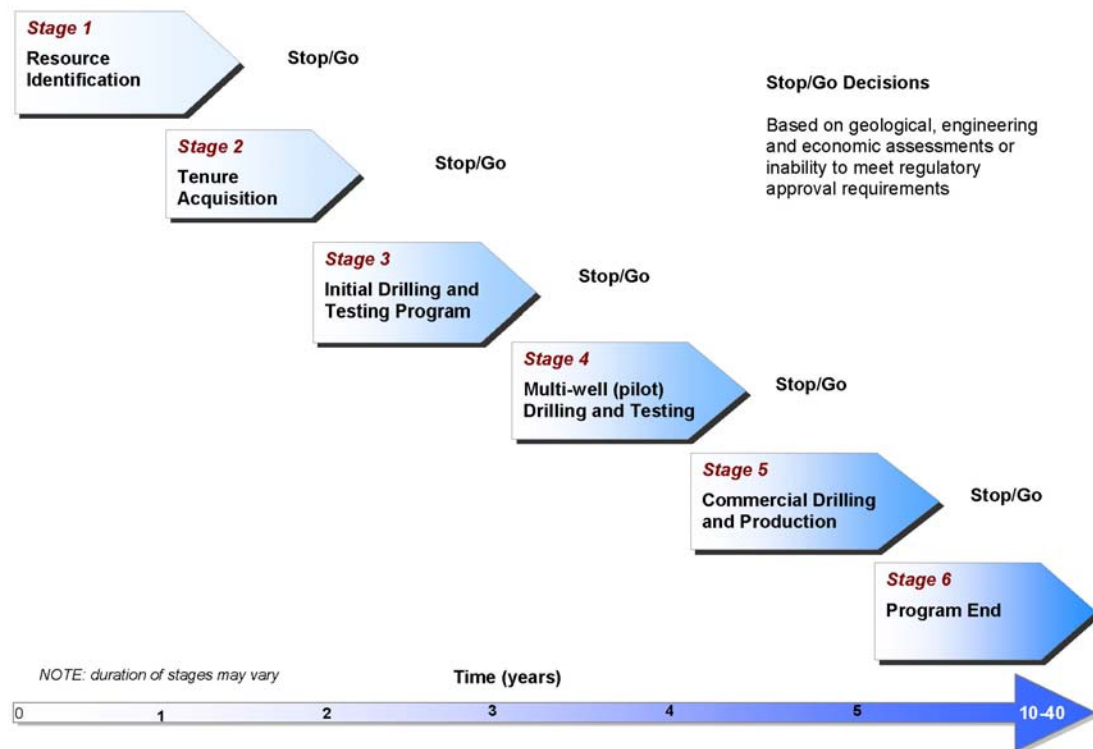
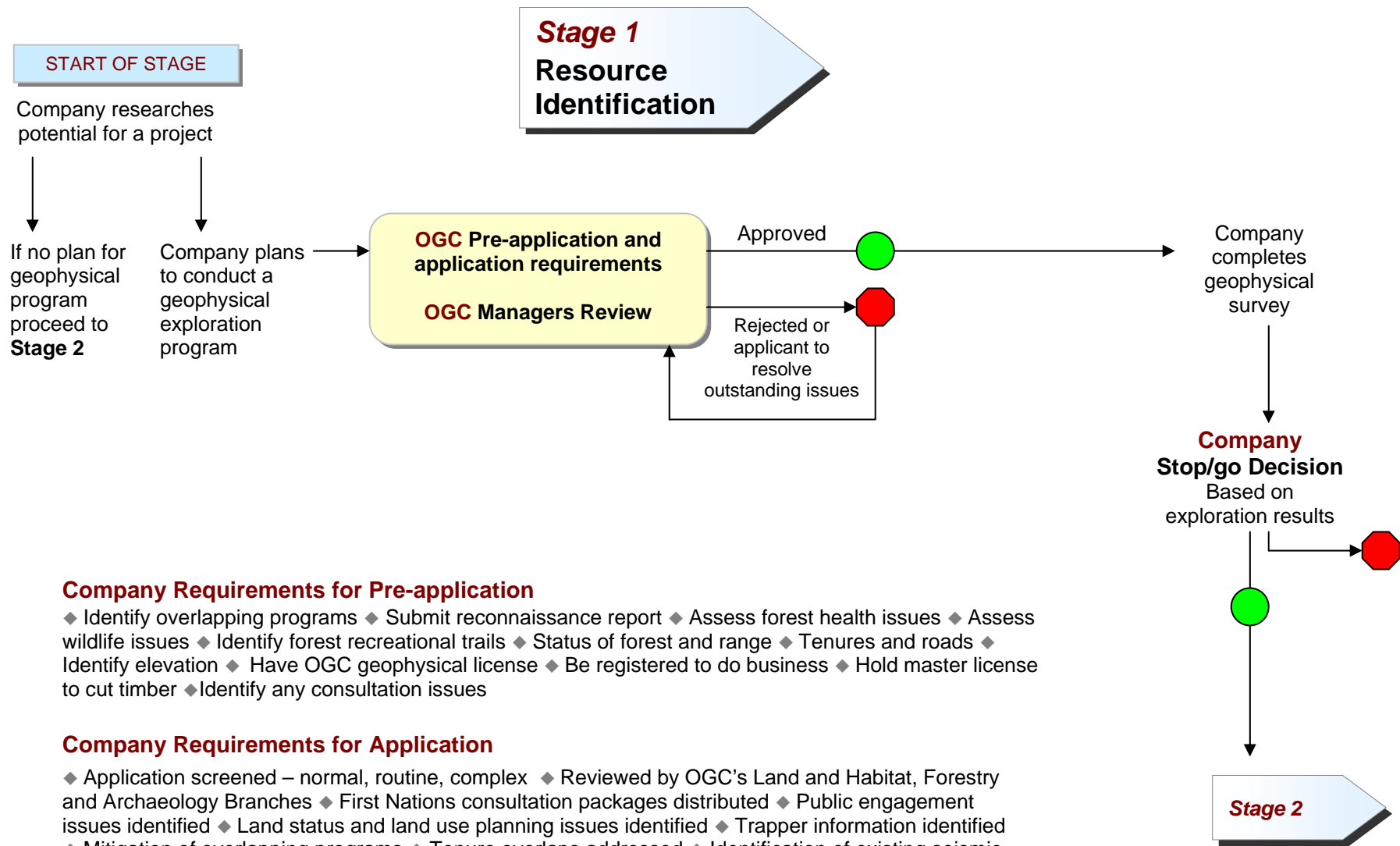


Figure 1 Overview of Unconventional Gas Development Stages

# British Columbia's Oil and Gas Commission

## Stages of Unconventional Gas Development



### Company Requirements for Pre-application

- ◆ Identify overlapping programs
- ◆ Submit reconnaissance report
- ◆ Assess forest health issues
- ◆ Assess wildlife issues
- ◆ Identify forest recreational trails
- ◆ Status of forest and range
- ◆ Tenures and roads
- ◆ Identify elevation
- ◆ Have OGC geophysical license
- ◆ Be registered to do business
- ◆ Hold master license to cut timber
- ◆ Identify any consultation issues

### Company Requirements for Application

- ◆ Application screened – normal, routine, complex
- ◆ Reviewed by OGC's Land and Habitat, Forestry and Archaeology Branches
- ◆ First Nations consultation packages distributed
- ◆ Public engagement issues identified
- ◆ Land status and land use planning issues identified
- ◆ Trapper information identified
- ◆ Mitigation of overlapping programs
- ◆ Tenure overlaps addressed
- ◆ Identification of existing seismic lines
- ◆ Geophysical specifications -program type, energy source, construction and line type

# British Columbia's Oil and Gas Commission

## Stages of Unconventional Gas Development

### Stage 2 Tenure Acquisition

Company requests that Ministry of Energy, Mines & Petroleum Resources (MEMPR) offer rights for auction

#### MEMPR Tenure Referral

Proposed tenure parcels referred to First Nations, local governments and government agencies for review and comment

#### MEMPR Tenure Review

Tenure parcels reviewed for conflicts with:

- land use plans
- surface and subsurface tenure
- land use designations that restrict or limit access

Parcel configurations are adjusted and referral comments translated into tenure conditions

Approved

Tenure request rejected or deferred until outstanding issues resolved

#### MEMPR Tenure Auction

Tenure parcels offered for competition in requested MEMPR monthly auction of oil and gas rights

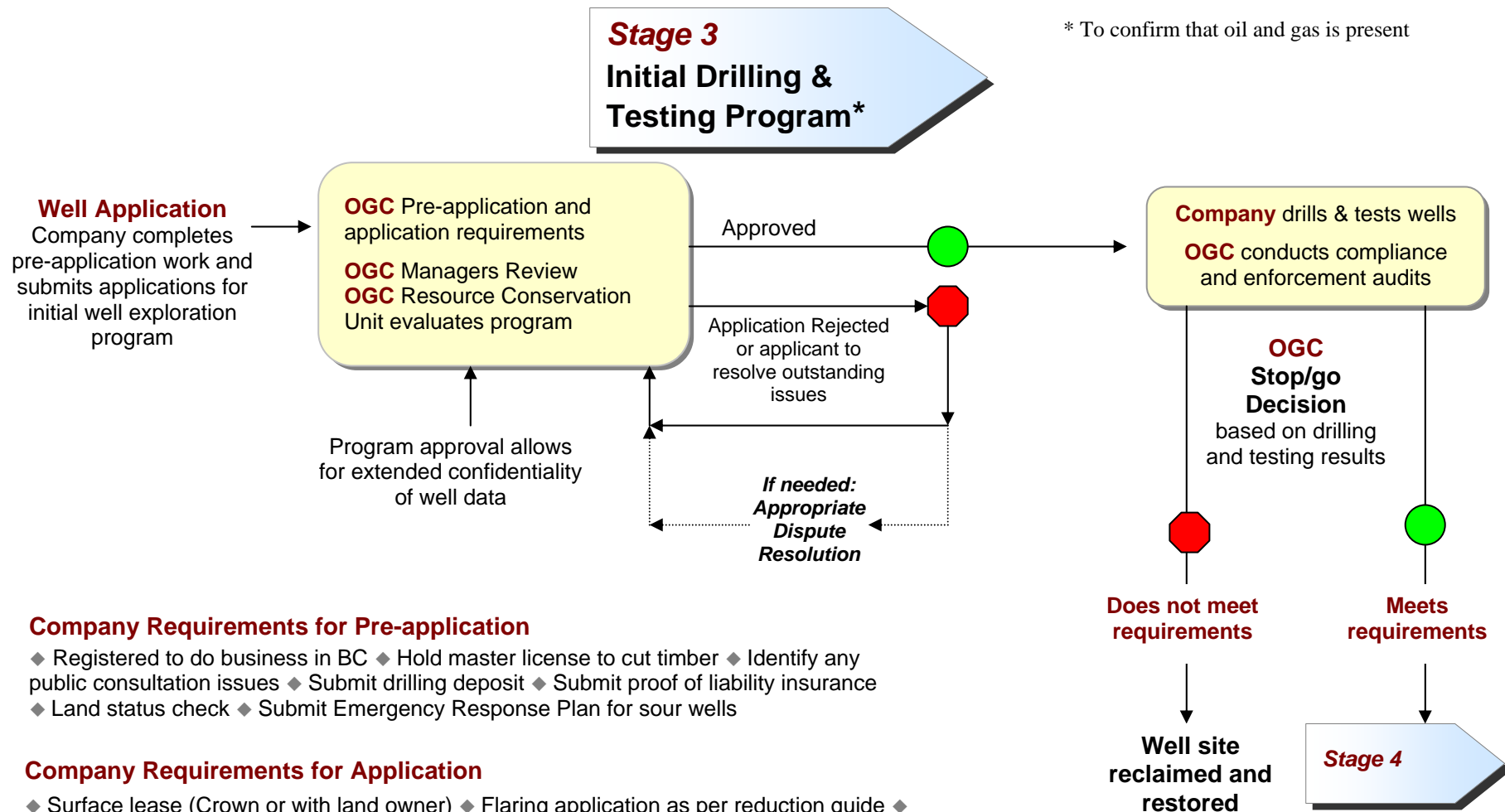
**Tenure NOT issued** if bid deemed not fair value for parcel or if no bids received

**Tenure issued** to successful bidder

### Stage 3

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## Stages of Unconventional Gas Development



### Company Requirements for Pre-application

- ◆ Registered to do business in BC
- ◆ Hold master license to cut timber
- ◆ Identify any public consultation issues
- ◆ Submit drilling deposit
- ◆ Submit proof of liability insurance
- ◆ Land status check
- ◆ Submit Emergency Response Plan for sour wells

### Company Requirements for Application

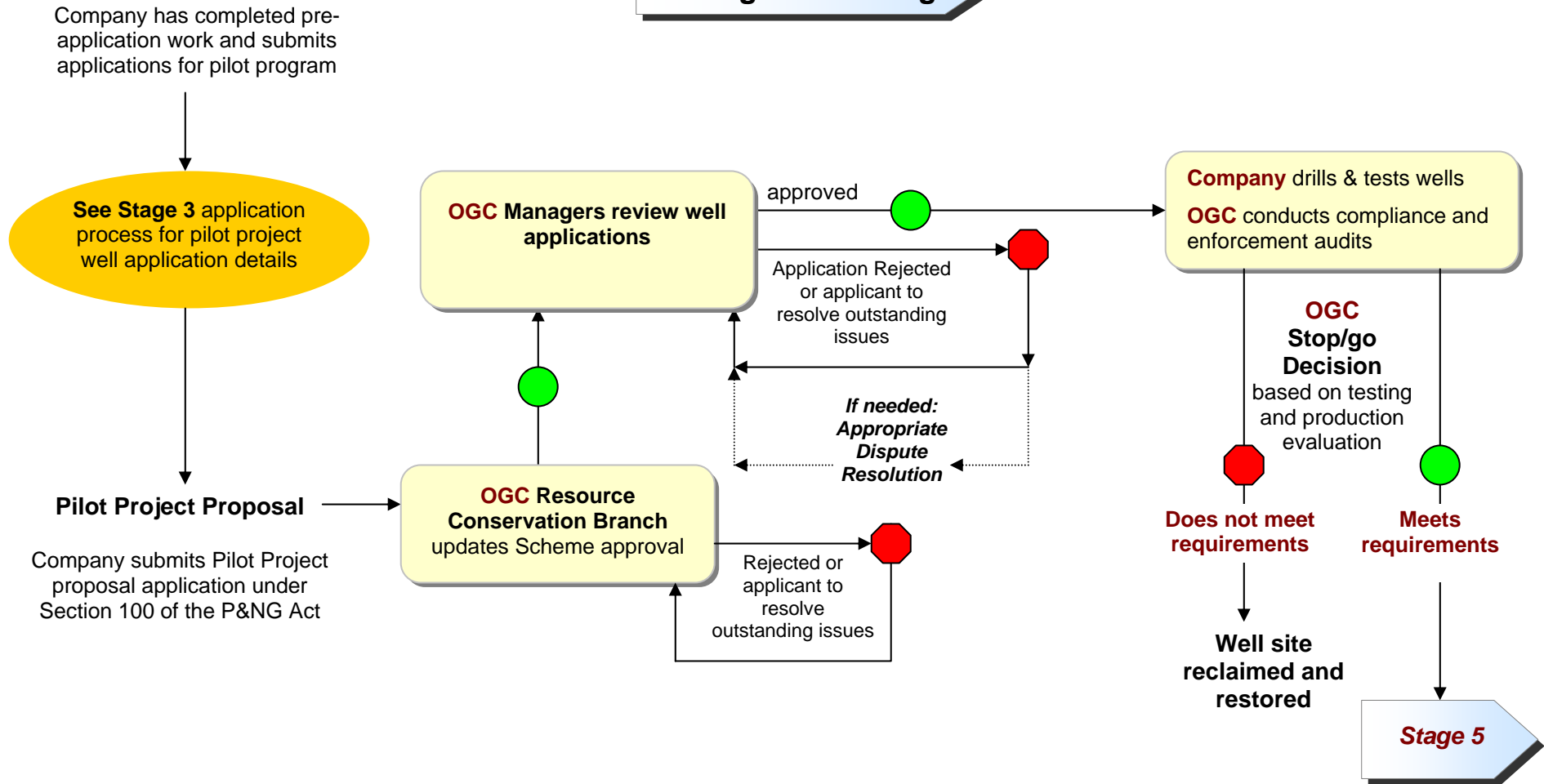
- ◆ Surface lease (Crown or with land owner)
- ◆ Flaring application as per reduction guide
- ◆ Emergency response plan
- ◆ Application screened – normal, routine, complex
- ◆ Reviewed by OGC's Land and Habitat, Forestry and Archaeology units
- ◆ First Nations consultation packages distributed
- ◆ Public engagement issues identified
- ◆ Land status and land use planning issues identified
- ◆ Non exclusive tenures overlaps
- ◆ Agricultural Land Reserve review
- ◆ Land and habitat protection review

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## Stages of Unconventional Gas Development

### Stage 4 Multi-well (pilot) Drilling and Testing\*

*\*To prove economic viability of the project*

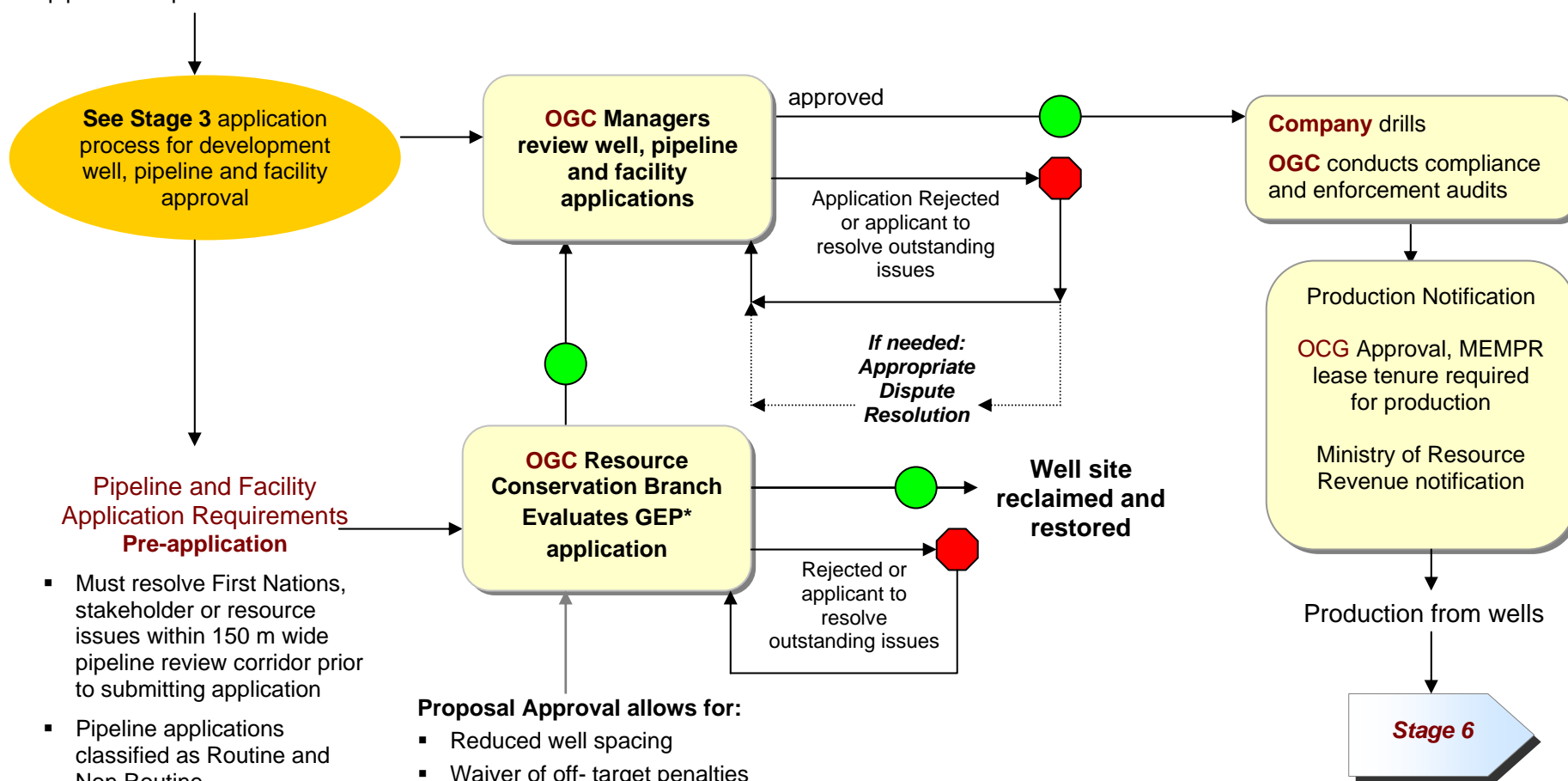


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## Stages of Unconventional Gas Development

### Stage 5 Commercial Drilling and Production

Company completes pre-application work and submits applications for development wells, pipelines or production facilities



\*Good engineering practice

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## Stages of Unconventional Gas Development

