# Testing requirements for Geothermal exploration in RSM

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# Steps in geothermal exploration

1. Review and Study of Existing Data
2. Studies of Surface Manifestations and Geochemical Studies
3. Geological Exploration
4. Geophysical Exploration
5. **Exploration Drilling and Flow Testing**
6. Preliminary Resources Estimate

ÍSOR ICELAND GEOSURVEY AFRY ÅF PÖYRY

# Four aspects will be looked at during proposal evaluation of drilling programs and well designs

**Drilling programs and well designs (15%)**

| No. | Items to be evaluated | Points |
|---|---|---|
| 1 | Well design and applicability of the design | 30 |
| 2 | Rig requirements based on the well design | 10 |
| 3 | Drilling program (including estimated drilling time and drilling fluid program) | 30 |
| 4 | Well-testing design and well testing program (to determine success) | 30 |

Next slides

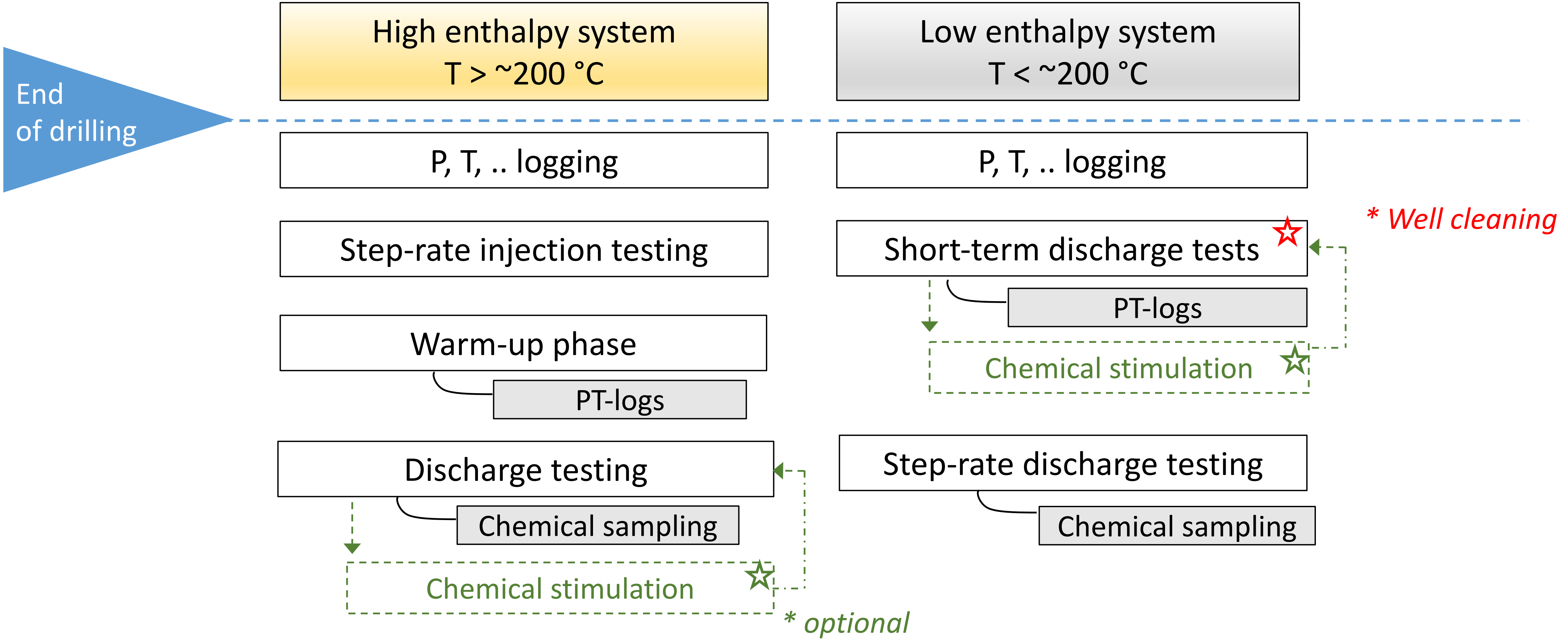
# Key requirements

**for drilling programs and well designs, aspect testing**

- Mud logging and wireline logging
  - Record drilling parameters, drilling mud properties & analyse cuttings
  - Geophysical borehole logs: CAL, PT, GR, CBL, directional survey, etc.
- Well completion test
  - PT logging; geophysical logging of uncased borehole section
  - Drilling rig stays on site to support testing and well development activities
  - Injectivity and/or short discharge testing of wells.
  - Investigation goals: Feed zone location and quantitative estimates (P, T, Q)
- Discharge testing for estimating success.
  - Drilling rig is replaced by a work-over rig or a crane
  - Test duration is significantly longer (weeks)
- For both testing categories:
  - Airlift techniques or submersible borehole pumps may be required if production cannot be achieved by artesian pressure

CAL: Caliper, PT: pressure/temperature, GR: natural gamma, CBL: cement bond log, P: pressure, T: temperature, Q: production rate

# Well logging and well testing procedures



# Key points

- A well testing protocol will be mutually agreed on
  > Beneficiary Manual 2.0, Chapter 6 and Appendix 5
- The success of a well must be confirmed or denied by test procedures appropriate to the nature of the geothermal resource.
- Accurate judgment depends on data quality & test documentation
  - ✓ Sufficient duration of tests
  - ✓ Quality of test plan and test equipment (flow, pressure, temperature)
  - ✓ Other issues: non-condensable gases
- Power output calculation: formulas are given for specific geothermal scenarios: condensing power plant, binary power plant & thermal application
  > Beneficiary Manual 2.0, Appendix 7
- Test data are acquired, evaluated and interpreted by the Beneficiary and reviewed by RSM experts
- Success or failure will be confirmed by the RSM experts by comparing the test results with the agreed success criteria


Thank you