

# Oil & Gas



## Drilling 101

Oil and gas rules require the selection of a well surface location to minimize impacts by:

- Encouraging use of existing roads and utility corridors,
- Encouraging use of lands that already have been disturbed,
- Avoiding sensitive lands, surface water resources and endangered species, and
- Using directional drilling to avoid sensitive surface locations and minimize surface impacts.

Once a site has been selected and surveyed, an access road is constructed, a drilling pad is contoured and paved with limerock or hardwood planks, utilities are set up, and a water well for drilling water is established if necessary.

The drilling process begins with the installation of a cellar, a rectangular workspace around the drilling hole. The crew then begins drilling the main hole, and a large-diameter conductor casing is used to line the first 150 to 250 feet of wellbore. This starter hole is much shallower and wider than the future primary wellbore. Next, the drill rig, generators and other equipment can be installed. A mud circulation tank system is set up to lift rock cuttings from the drill bit to the surface and filter those cuttings from the drilling mud.



*Horizontal well drilling at Jay Field*

A surface hole is typically drilled 1,400 to 2,000 feet deep, or below the base of the underground source of drinking water. Once the specified depth is reached, the drill crew lines the borehole with well casing and cements it in place to prevent wellbore collapse and protect potential drinking water aquifers. In South Florida, an intermediate hole is drilled cased and cemented in order to isolate the well from a particularly porous and saline layer known as the “Boulder Zone.”

Finally, a production hole is drilled to total depth and logged with borehole geophysical tools that define the rock characteristics to help determine how the well will be completed. If the well appears commercially viable, surface casing is set, cemented and perforated at an interval that allows best petroleum/brine ratio to flow into the well and be pumped to the surface.

The types of oil and gas wells regulated in Florida include:

**Straight holes** – Usually drilled vertically to a bottom hole target directly beneath the surface hole.

**Directional holes** – Drilled with steerable drill bits to specific targets at some lateral distance from the surface hole location.

- Directional drilling is routinely used to minimize surface impacts by avoiding sensitive lands at the surface and by grouping wellheads on a single pad for several bottom-hole targets.
- Horizontal drilling is primarily intended to expose a much greater well bore segment to oil and gas bearing reservoir.

In southwest Florida, approximately 30 horizontal wells have been permitted since 1992 to access the relatively broad and shallow oil and gas reservoirs that characterize the region.

In northwest Florida, horizontal wells have been attempted in unitized oilfields to produce more oil and gas per well.

- Underground Injection Control Class II Wells are used for injection of oilfield brine for disposal or reservoir pressure maintenance.
- Underground natural gas storage wells (new rules pending) are used for injection and recovery of refined natural gas in oilfields converted into natural gas storage facilities.