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(54) Titre : SOCLE MODULAIRE DE PUITS
(54) Title: MODULAR WELLPAD CONSTRUCTION SYSTEM

(57) Abrégé/Abstract:
A modular wellpad assembly for a wellpad site comprising at least one injection wellhead for application of an injection fluid under pressure into an area adjacent the site and at least one extraction wellhead for receiving an extracted product from the area. A
(57) Abrégé(suite)/Abstract(continued):
manifold system is releasably connectable to the at least one injection wellhead for communication with a source of fluid under pressure and releasably connectable to the at least one extraction wellhead for communication with a processing facility. The manifold system is formed from modular components that include a wellhead control module joinable in a side-by-side configuration to a piping module. The wellhead control module is connectable between the at least one injection and extraction wellheads and each piping module, and as many piping modules as necessary are joinable together to connect to the source of fluid under pressure and to the processing facility. Injection and extraction wellheads are installable at the wellpad site as necessary for extraction of the product.
ABSTRACT OF THE DISCLOSURE

A modular wellpad assembly for a wellpad site comprising at least one injection wellhead for application of an injection fluid under pressure into an area adjacent the site and at least one extraction wellhead for receiving an extracted product from the area. A manifold system is releasably connectable to the at least one injection wellhead for communication with a source of fluid under pressure and releasably connectable to the at least one extraction wellhead for communication with a processing facility. The manifold system is formed from modular components that include a wellhead control module joinable in a side-by-side configuration to a piping module. The wellhead control module is connectable between the at least one injection and extraction wellheads and each piping module, and as many piping modules as necessary are joinable together to connect to the source of fluid under pressure and to the processing facility. Injection and extraction wellheads are installable at the wellpad site as necessary for extraction of the product.
MODULAR WELLPAD CONSTRUCTION SYSTEM

FIELD OF THE INVENTION

This invention relates to a system for extracting oil from an underground source of bitumen using steam-assisted gravity drainage (SAGD). In particular, the present invention provides a modular wellpad system for servicing and supporting injection and extraction wells. The system is intended to be installed as a plurality of interconnectable modules on site to minimize field labour requirements.

BACKGROUND OF THE INVENTION

Oil sands, also referred to as tar sands or bituminous sands, are a combination of solids (generally mineral components such as clay, silt and sand), water, and bitumen. Although the term “sand” is commonly used to refer to the mineral components of the mixture, it is well known that this term is meant to include various other components such as clay and silts. Technically speaking, the bitumen is neither oil nor tar, but a semisolid form of oil which will not flow toward producing wells under normal conditions.

Oil sands are found in a number of large deposits around the world, such as the Athabasca Tar Sands in Alberta, Canada. If the deposits are close enough to the surface, the oil sands are preferably mined using open pit mining techniques to extract the bitumen which is processed further at specialized refineries. If the deposits are too deep underground for open pit mining, the oil must be recovered by in situ techniques such as steam-assisted gravity drainage (SAGD). The SAGD process involves using horizontal wells to inject steam and/or other solvents into the deposit to heat the oil sand thereby lowering the viscosity of the bitumen. Hot bitumen and condensed steam migrate towards horizontal production wells which bring the bitumen to the surface. Most of the sand is left in place. Production in the form of mixed condensed water and bitumen can be recovered to the surface by natural or artificial lift. In natural lift, stream pressure is the motive force. Various
forms of artificial lift may be employed. In gas lift, a gas (usually natural gas) is injected into the production stream to lift the column of fluid. In mechanical lift, pumps are installed in the production string to transport production to the surface.

The SAGD process described above employs a great deal of equipment including piping, valves and instrumentation to control and monitor the steam injection and bitumen extraction. A collection of steam injection and extraction wells, arranged in well pairs, with associated SAGD process equipment positioned at the surface above a site of an underground oil sand deposit is generally termed a wellpad.

The SAGD process also requires a great deal of water to generate steam for injection into the ground at the injection wells. This water is generally processed at a central plant to produce steam for delivery to the wellpad. The bitumen produced at the extraction wells requires transport from the wellpad to the central plant for collection, further processing to remove water, and eventual delivery to an upgrader plant to convert the bitumen into petroleum products. The handling of steam and production at the wellpad requires insulated piping, pumps, control valves and monitoring equipment at the wellpad.

According to current practice, the wellpad equipment necessary for transporting steam and heated bitumen between the central plant and the well pairs is assembled at the wellpad site. This involves moving the unassembled equipment to the wellpad, organizing and arranging the equipment and making connections between the various components. This approach adds significant costs to the construction of a new wellpad as labour for performing the field work is expensive. Work in the field must often be performed under less than ideal site conditions outside.
SUMMARY OF THE INVENTION

In an aspect of the present invention, to address the foregoing issues with current SAGD wellpad construction, there is provided a modular wellpad assembly for use at wellpad site.

Accordingly, the present invention provides a modular wellpad assembly for a wellpad site comprising:

- at least one injection wellhead for application of an injection fluid under pressure into an area adjacent the site;
- at least one extraction wellhead for receiving an extracted product from the area; and
- manifold means releasably connectable to the at least one injection wellhead for communication with a source of fluid under pressure and releasably connectable to the at least one extraction wellhead for communication with a processing facility;
- the manifold means comprising at least one wellhead control module joined in a side-by-side configuration to at least one piping module, the at least one wellhead control module being connectable between the at least one injection and extraction wellheads and the at least one piping module, and at the at least one piping module being connectable to the source of fluid under pressure and to the processing facility.

In a further aspect of the present invention, there is provided a modular wellpad assembly comprising:

- a wellpad site;
- a source of fluid under pressure;
at least one injection wellhead for application of an injection fluid under pressure into an area adjacent the site;

5 at least one extraction wellhead for receiving an extracted product from the area;

manifold means releasably connectable to the at least one injection wellhead for communication with a source of fluid under pressure and releasably connectable to the at least one extraction wellhead for communication with a processing facility;

the manifold means comprising at least one wellhead control module joined in a side-by-side configuration to at least one piping module, the at least one wellhead control module being connectable between the at least one injection and extraction wellheads and the at least one piping module, and at the at least one piping module being connectable to the source of fluid under pressure and to the processing facility.

In a still further aspect of the present invention, there is provided a modular wellpad component for communicating a wellpad site to a processing facility, the wellpad site having at least one injection wellhead for application of an injection fluid under pressure into an area adjacent the site and at least one extraction wellhead for receiving an extracted product from the area, and the processing facility having a source of injection fluid, the modular wellpad component comprising:

at least one wellhead control module joined in a side-by-side configuration to a piping module, the at least one wellhead control module being connectable between the at least one injection wellhead and the piping module for communication with the source of fluid and between the at least one extraction wellhead and the piping module for communication with the processing facility, with at least one piping module being connectable to the source of fluid under pressure and to the processing facility;
whereby the wellhead control modules serve to connect the wellheads with the piping module and the piping module serves to connect the establish communication between the wellheads, the source of injection fluid and the processing facility.

The present invention also provides a wellpad assembly for a wellpad site comprising:

10 at least one injection wellhead for application of an injection fluid under pressure into an area adjacent the site;

at least one extraction wellhead for receiving an extracted product from the area, the at least one extraction wellhead and the at least one injection wellhead forming at least one wellhead pair;

a wellhead control module releasably connectable to each wellhead pair; and

at least one piping module releasably connectable to the wellhead control module via a control module connection region to allow the piping module to communicate the wellhead control module with a source of fluid under pressure and a processing facility for the extracted product.

In a further aspect, the present invention provides a modular wellpad system for communicating a wellpad site to a processing facility, the wellpad site having at least one injection wellhead for application of an injection fluid under pressure into an area adjacent the site and at least one extraction wellhead for receiving an extracted product from the area, with injection and extraction wellheads being paired to define a wellhead pair, and the processing facility having a source of injection fluid, the modular wellpad system comprising:

a wellhead control module releasably connectable to each wellhead pair;
at least one piping module releasably connectable to the wellhead control module at a control module connection region to allow the piping module to communicate the wellhead control module with the source of fluid under pressure and the processing facility.

In most arrangements at a typical wellpad site, there will be a plurality of piping modules connected to each other via piping module connection regions to define a pipe line for the transport of fluid under pressure and a pipe line for extracted product. There will also be a plurality of wellhead control modules with each wellhead control module servicing a wellhead pair and being connected to a particular piping module via the control module connection region for that piping module. In a preferred arrangement, each piping module includes two control module connection regions for connection to two well head control modules. In another preferred configuration, the wellhead control modules extend outwardly from the piping module to which they are connected at approximately right angles.

The wellpad assembly and system provide a safer and more effective way to install equipment on a wellpad site. Modules are constructed offsite and transported to the site as needed where connections between modules and wellheads can be made. This serves to minimize field construction and labour costs.

Use of modules also permits ready relocation of equipment at the end of a wellpads’ production lifespan. Just as the modules are efficiently assembled at a wellpad, they can also be efficiently dismantled when the well site is depleted and abandoned. The modules are recycled by moving to a new site or being incorporated into a different, existing wellpad.
BRIEF DESCRIPTION OF THE DRAWINGS

Aspects of the present invention are illustrated, merely by way of example, in the accompanying drawings in which:

Figure 1 is an overall schematic plan view of an exemplary SAGD operation with a central processing plant and associated wellpads;

Figure 2 is a schematic plan view of a wellpad employing the modules according to an embodiment of the invention;

Figure 3 is a detail cross-section view taken through the wellpad;

Figure 4 is a perspective view of the wellpad of Figure 2 showing the layout of the modules;

Figure 5 is a cross-sectional schematic view taken through the wellpad along line 5-5 of Figure 2; and

Figure 6 is a plan view of an exemplary wellhead control module and represents a detail view of the indicated region of Figure 4;

Figure 7 is a perspective view of an exemplary wellhead control module and represents a detail view of the indicated region of Figure 4;

Figure 8 is a plan view of an exemplary arrangement of wellhead control modules and piping modules and represents a detail view of the indicated region of Figure 4; and

Figure 9 is a detail perspective view of wellhead control modules and the piping modules of Figure 8.
DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figure 1, there is shown a schematic plan view of a typical SAGD operation site layout. A central processing plant 2 provides steam generation and water processing and bitumen processing facilities at a location above a known buried oil sand deposit 4 shown in dashed lines. Plant 2 also serves as a distribution hub for electrical power which is brought to the plant via powerline 5. A main access road 7 provides worker access. Positioned about the central processing plant 2 are a plurality of wellpads 6. Wellpads 6 are located as necessary to access zones of the buried oil sand deposit 4. Each pad 6 is connected to the central processing plant 2 by a steam line 8, a bitumen product line 9, and a power line 10. A pad access road (not shown) extends from the plant to each wellpad to facilitate movement of equipment to and from the wellpads.

At each wellpad 6, wellheads 12 are installed to inject steam into the deposit and extract bitumen from the site according to the SAGD process. Each pad has at least one injection wellhead for application of steam into the site and at least one extraction wellhead for receiving bitumen from the area. Injection wellheads and extraction wellheads are grouped in pairs 12. The number and positioning of the wellhead pairs 12 will depend on geology of the deposit in the vicinity of the wellpad. The bitumen product extracted from the deposit via the extraction wellhead is a mixture of water, bitumen and gas which is delivered by pumping back to central plant 2 via bitumen product line 9. At central plant 2, the bitumen product is processed to remove water and gas and stored, and/or pumped to an upgrader facility (not shown) via plant pipeline 14 for conversion into petroleum products.

Figure 2 is a detail schematic view of an exemplary wellpad 6 employing the module system described above. Figure 4 is perspective view of the pad comprising a drilling area 20, an equipment area 22, and retention ditches 24 within the drilling area 20. Figure 3 shows a typical cross-section through the wellpad 6 in which the original grade 26 of the site is generally levelled by using fill 28 overlaid with a clay
layer 30 and a gravel layer 32. Fill 28 is preferably distributed atop a geotextile layer 29. Retention ditches 24 are formed about the periphery of the wellpad in the clay layer adjacent berms 34 defining the edge of the pad. The pad surface 36 is preferably developed with a constant high point elevation down the centre of the pad under the equipment sloping to the ditches at each side. Ditches 34 are provided to collect surface runoff from the equipment area 22. In an alternative arrangement, instead of ditches 34, the pad may be formed with a pond adjacent a side to retain runoff.

Returning to Figures 2 and 4, wellpad 6 is the site for a plurality of paired wellheads 40a and 40b. Each pair of wellheads comprises an injection wellhead 40a for injecting steam under pressure into the subterranean oil sand deposit over which the wellpad is built, and an extraction wellhead 40b for receiving production in the form of bitumen, water and gas which has migrated toward the extraction well. The spacing and positioning of the wellheads is determined by the geology of the oil sand deposit.

As shown schematically in Figure 2, each pair of wellheads 40a and 40b is connected to steam line 8, and bitumen product line 9 via manifold means in the form of a plurality of modular manifold units. In the illustrated arrangement, the manifold portions include a plurality of wellhead control modules 42 and a plurality of piping modules 44. Wellhead control modules 42 extend from pairs of wellheads 40a,40b for connection to a piping module 44 at a control module connection region 43 in a side-by-side configuration. In one preferred arrangement, each module is design to a unilevel plan for the sake of simplicity. It will be appreciated the modules may also be designed according to a layout that includes multiple levels.

Piping modules 44 in turn are connected to each other at piping module connection regions 45 to form a "pipeline corridor" that communicates with steam line 8 and bitumen product line 9 from the central plant such that the wellhead control modules 42 and the piping modules 44 co-operate to communicate the wellheads to the central plant.
Each type of module 42 or 44 is preferably a standard unit for ease of construction and interconnection between module units. Figure 5 is a cross-section through an exemplary pair of modules 42 and 44 taken along line 5-5 of Figure 2. In general, wellhead control module 42 comprises an open structural steel framework adapted to support pipelines and valve equipment for control of the flow of fluids through the pipelines. Figure 5 illustrates a single level of pipes, however, it will be appreciated that the framework can be designed to include multiple levels for carrying pipes at different levels. Similarly, piping module 44 comprises an open structural steel framework 83 adapted to support pipelines and ancillary control equipment for control flow through the pipelines.

In particular, a wellhead control module 42 includes valving 60 and piping 62 to carry injection fluid (steam) to the injection wellhead 40a from steam pipeline 8 on piping module 44. Similarly, module 42 includes valving 64 and piping 66 to deliver bitumen product from extraction wellhead 40b to pipeline 9 on the piping module. Conventional flexible joints 68 are used to connect the pipelines of the wellhead control module 42 to the wellheads 40a and 40b. In other words, as its name implies, the wellhead control module 42 preferably includes the specialized equipment in the form of piping and monitoring equipment necessary to control and oversee the flow of material between a pair of wellheads and the piping module 44. The equipment is supported on a framework 69 which is supported above the surface 36 by piles 72.

Still referring to Figure 5, piping module 44 preferably comprises an external framework 83 that supports pipelines. Each piping module 44 is connectable to other piping modules to define a piping corridor that includes steam pipeline 8 and extracted product pipeline 9. Additional pipelines 80 and 82 may be provided in some of the piping modules 44 to transport other materials such as natural gas from the central facility to the wellpad 6. As well, additional pipelines 80 and 82 may be used for production testing which involves directing the production flow from a particular well pair to a test separator instead of having the production flow directly
to product pipeline 9.

As best shown in Figure 2, each piping module 44 has ends which define piping module connection regions 45 for connecting one piping module to another adjacent module to form one or more continuous pipelines. In other words, one or both side of each piping module 44 may include a wellhead control module connection region 43 to allow for joining of a wellhead control module 42 to the piping module 44, and at the same time, one or both ends of the piping module may include a piping module connection region 45 to permit joining of piping modules one to another.

It should be emphasized that Figures 2 and 5 show the modules and their interconnection in schematic form. By way of example, Figures 6 and 7 show plan and perspective views, respectively, of a wellhead control module 42 and associated piping and equipment. Figures 6 and 7 are detail views of the regions indicated on Figure 4. For ease of access for workers, stairs 75 and a walkway 76 are provided with piping 62, 66 and valve stations being located on either side of the walkway to facilitate access to equipment for inspection and maintenance. As previously described, piping 62 carries injection fluid (steam) to the injection wellhead 40a from steam pipeline 8, and piping 66 delivers bitumen product from extraction wellhead 40b to pipeline 9.

In particular, Figure 6 shows a wellhead control module connection region 43 which defines a zone at the wellhead control module 42 in which piping from the module 42 is configured in a substantially standard arrangement to align and mate with similarly configured piping connections at the adjacent piping module 44. In the example of Figure 6, four primary connections have to be made at joints 200, 201, 202 and 203 to link control module 42 to piping module 44. These primary connections may be field welds or some other conventional pipe joining technique performed by a field worker to quickly and efficiently establish connections between the two modules.
Figures 8 and 9 show detailed plan and perspective views, respectively, of wellhead control modules 42 and piping modules 44. Figure 8 is a detail view of the region indicated on Figure 4. In Figures 6 to 9, elements previously identified and described are labelled with identical reference numbers.

In particular, Figure 8 shows details of a piping module connection region 45 in which a pair of piping modules 44 are joined end to end. Region 45 defines a zone at a first piping module 44 in which piping from the module is configured in a substantially standard arrangement to align and mate with similarly configured piping connections at the adjacent piping module 44. In the example of Figure 8, four primary connections have to be made at joints 300, 301, 302 and 303 to link the adjacent piping modules together. These connections may be made by a worker as field welds or some other conventional piping joining technique.

In the illustrated embodiment, each module is typically uncovered. Heated protective enclosures are used to house and protect instrumentation. If required, the pipelines may be heated, traced and insulated.

Preferably, each module is constructed offsite and shipped to the site for assembly. The dimensions of each module are therefore limited due to handling and shipping constraints. For example, in the illustration embodiment, the limiting dimensions for each module are about 30 meters in length and about five meters wide. In a preferred arrangement, these dimensions permit a piping module 44 to be connected with two wellhead control modules 42 and, thus, two wellhead pairs or four wellheads in total.

As best shown in Figure 4, at least two adjacent piping modules 44 are fitted with piping configured to provide a thermal expansion loop 46. By way of example, the dimensions of loop 46 would be approximately 10 metres by 10 metres for 24'' NPS pipeline. In general, such expansion loops are installed in the field. Due to the physical size of the loops, it is not currently considered economical to design an expansion loop into each module.
It is emphasized that a piping module 44 is not necessarily connected to a wellhead control module 42. As best shown in Figure 2, a plurality of piping modules 44 may be connected end to end at adjacent piping module connection regions 45 to form pipeline sections 51 which do not connect directly to a wellhead control module 42. When two pipeline sections 51 join to define a turn as at 53 in Figure 2, the pipeline module connection region 45 of a first pipeline module 44' is preferably joined to the connection region 43 of a second pipeline module 44" to ensure a straight forward connection that is readily created by a worker in the field.

In regard to design and construction of the modules, the more repetitive and similar the modules are to each other, the less engineering design is required and improved fabricating efficiencies are achieved. Preferably, where possible, identical modules would allow prefabrication to be completed for numerous wellpads for use and reuse, as required. In particular, ensuring that module connection zones 43 and 45 are standardized to as great an extent as possible may still allow non-identical modules to be interconnected in the field with minimal work. Due to different well layouts and the requirement for expansion loops, it is recognized that it is not generally possible to make all modules identical. To some extent, each module will be partially tailored for its particular location. In a preferred arrangement, the wellhead 40a,40b layout at the wellpad is set up as a consistent pattern of injection wellhead and extraction wellhead to make repetitive interconnections of identical modules possible. Similarly, as long as equipment in the module connection zones 43 and 45 is laid out in a standard configuration despite the layout of the equipment on the associated module, adjacent wellhead control modules 42 and piping modules 44 may be joined together with minimal work in the field.

Although the present invention has been described in some detail by way of example for purposes of clarity and understanding, it will be apparent that certain changes and modifications may be practised within the scope of the appended claims.
The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A modular wellpad assembly for a wellpad site comprising:

   at least one injection wellhead for application of an injection fluid under pressure into an area adjacent the site;

   at least one extraction wellhead for receiving an extracted product from the area; and

   a manifold means releasably connectable to the at least one injection wellhead for communication with a source of fluid under pressure and releasably connectable to the at least one extraction wellhead for communication with a processing facility;

   the manifold means comprising at least one modular wellhead control unit joined in a side-by-side configuration to at least one piping module in a generally unilevel arrangement, the at least one modular wellhead control unit being connectable between the at least one injection and extraction wellheads and the at least one piping module, and at the at least one piping module being connectable to the source of fluid under pressure and to the processing facility.

2. The modular wellpad assembly of claim 1 including a separator system connectable to the manifold means for separating the extracted product into a gas portion and a liquid portion.

3. The modular wellpad assembly of claim 2 including recycling means to process the recovered injection fluid portion for recycling to the injection wellhead or the source of fluid under pressure.

4. The modular wellpad assembly of claim 2 in which the injection fluid portion
is water and the portion for processing is bitumen.

5. The modular wellpad assembly of claim 3 in which the injection fluid is pressurized steam.

6. The modular wellpad assembly of claim 5 including heat exchange means for using the pressurized steam as a heat source for the wellpad assembly.

7. The modular wellpad assembly of claim 1 in which the extracted product is a mixture of substantially bitumen and water.

8. The modular wellpad assembly of claim 1 in which the injection wellhead and the extraction wellhead communicate with non-vertical, directional wellbores.

9. The modular wellpad assembly of claim 1 in which the wellpad site comprises a region adapted to support the wellpad modular assembly.

10. The modular wellpad assembly of claim 1 in which the manifold means comprises a plurality of wellhead control modules and piping modules with each wellhead control module being connected between a pair of wellheads and each of the piping modules being connected to adjacent piping modules.

11. The modular wellpad assembly of claim 10 in the wellhead control modules and the piping modules are arranged in a support framework to support the modules at substantially the same level on the wellpad.

12. The modular wellpad assembly of claim 10 in which each piping module includes at least one pipe for carrying each of the injection fluid and the extracted product.

13. The modular wellpad assembly of claim 10 in which each wellhead control module includes piping and control systems and valves for controlling flow of the
injection fluid to and flow of the extracted product between the wellheads and the piping modules.

14. The modular wellpad assembly of claim 10 including flexible joint means to interconnect the wellhead control module with the wellhead.

15. A modular wellpad assembly comprising:

   a wellpad site;

   a source of fluid under pressure;

   at least one injection wellhead for application of an injection fluid under pressure into an area adjacent the site;

   at least one extraction wellhead for receiving an extracted product from the area;

   manifold means releasably connectable to the at least one injection wellhead for communication with a source of fluid under pressure and releasably connectable to the at least one extraction wellhead for communication with a processing facility;

   the manifold means comprising at least one wellhead control module joined in a side-by-side configuration to at least one piping module, the at least one wellhead control module being connectable between the at least one injection and extraction wellheads and the at least one piping module, and at the at least one piping module being connectable to the source of fluid under pressure and to the processing facility;

16. A modular wellpad component for communicating a wellpad site to a processing facility, the wellpad site having at least one injection wellhead for application of an injection fluid under pressure into an area adjacent the site and at
least one extraction wellhead for receiving an extracted product from the area, and the processing facility having a source of injection fluid, the modular wellpad component comprising:

5 at least one wellhead control module joined in a side-by-side configuration to a piping module, the at least one wellhead control module being connectable between the at least one injection wellhead and the piping module for communication with the source of fluid and between the at least one extraction wellhead and the piping module for communication with the processing facility, with at least one piping module being connectable to the source of fluid under pressure and to the processing facility;

whereby the wellhead control modules serve to connect the wellheads with the piping module and the piping module serves to connect the establish communication between the wellheads, the source of injection fluid and the processing facility.

17. A modular wellpad assembly for a wellpad site comprising:

20 at least one injection wellhead for application of an injection fluid under pressure into an area adjacent the site;

at least one extraction wellhead for receiving an extracted product from the area, the at least one extraction wellhead and the at least one injection wellhead forming at least one wellhead pair;

a wellhead control module releasably connectable to each wellhead pair; and

at least one piping module releasably connectable to the wellhead control module via a control module connection region to allow the piping module to communicate the wellhead control module with a source of fluid under pressure and a processing facility for the extracted product.
18. The modular wellpad assembly of claim 17 in which the at least one piping module comprises a plurality of piping modules connectable to each other via a piping module connection region to define a pipe line for the transport of fluid under pressure and a pipe line for extracted product.

19. The modular wellpad assembly of claim 18 in which there are a plurality of wellhead control modules with each wellhead control module being connectable to one of the plurality of piping modules via the control module connection region for the one piping module.

20. The modular wellpad assembly of claim 19 in which each piping module includes two control module connection regions for connection to two well head control modules.

21. The modular wellpad assembly of claim 20 in which each wellhead control module extends outwardly from the piping module to which the well head control module is connected.

22. The modular wellpad assembly of claim 17 in which each wellhead control module and each piping module are arranged in a support framework to support the modules at substantially the same level on the wellpad.

23. The modular wellpad assembly of claim 17 in which each piping module includes at least one pipe for carrying each of the injection fluid and the extracted product.

24. The modular wellpad assembly of claim 17 in which each wellhead control module includes piping, control systems and valves for controlling flow of the injection fluid to and flow of the extracted product between each wellhead pair and the piping modules.
25. The modular wellpad assembly of claim 17 including flexible joint means to interconnect the wellhead control module with the wellhead pair.

26. A modular wellpad system for communicating a wellpad site to a processing facility, the wellpad site having at least one injection wellhead for application of an injection fluid under pressure into an area adjacent the site and at least one extraction wellhead for receiving an extracted product from the area, with injection and extraction wellheads being paired to define a wellhead pair, and the processing facility having a source of injection fluid, the modular wellpad system comprising:

a wellhead control module releasably connectable to each wellhead pair;

at least one piping module releasably connectable to the wellhead control module at a control module connection region to allow the piping module to communicate the wellhead control module with the source of fluid under pressure and the processing facility.

27. The modular wellpad system of claim 26 in which the at least one piping module comprises a plurality of piping modules connectable to each other via a piping module connection region to define a pipe line for the transport of injection fluid under pressure and a pipeline for extracted product.

28. The modular wellpad system of claim 27 in which there are a plurality of wellhead control modules with each wellhead control module being connectable to one of the plurality of piping modules via the control module connection region for the one piping module.

29. The modular wellpad system of claim 28 in which each piping module includes two control module connection regions for connection to two well head control modules.

30. The modular wellpad system of claim 29 in which each wellhead control
module extends outwardly from the piping module to which the well head control module is connected.

31. The modular wellpad system of claim 26 in which each wellhead control module and each piping module are arranged in a support framework to support the modules at substantially the same level on the wellpad.

32. The modular wellpad system of claim 26 in which each piping module includes at least one pipe for carrying each of the injection fluid and the extracted product.

33. The modular wellpad assembly of claim 26 in which each wellhead control module includes piping, control systems and valves for controlling flow of the injection fluid to and flow of the extracted product between each wellhead pair and the piping module.