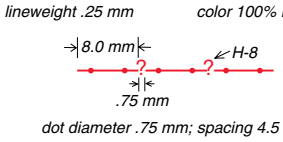
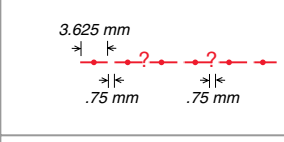
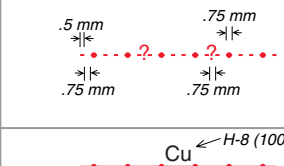
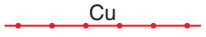
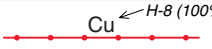
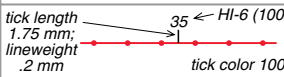
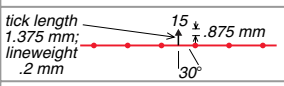
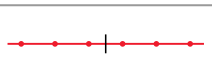
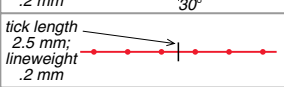
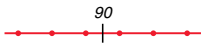
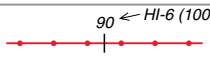
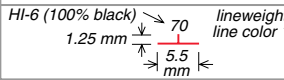
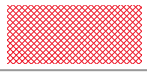
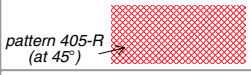
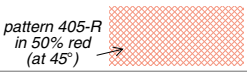
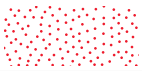
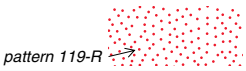
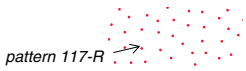
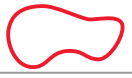
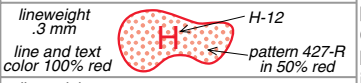
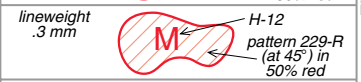
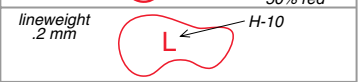
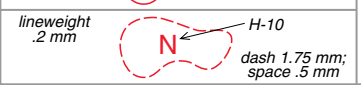
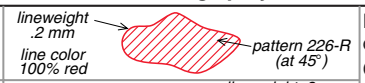
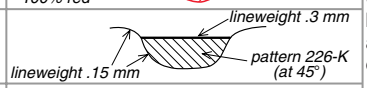
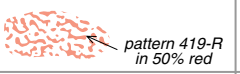
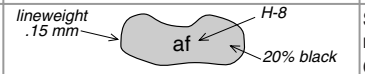
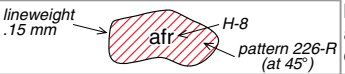
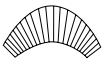
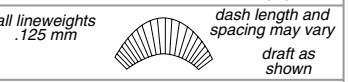
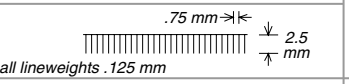
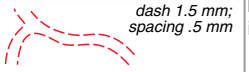
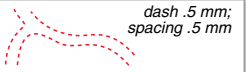
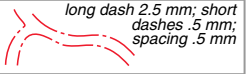
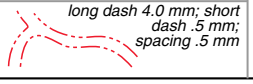
19—NATURAL RESOURCES

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
19.1—Veins and mineralized areas; mineral resource areas; metamorphic facies boundary				
19.1.1	Vein, veinlet, or mineralized stringer—Identity and existence certain, location accurate			May also be shown in black or other colors.
19.1.2	Vein, veinlet, or mineralized stringer—Identity or existence questionable, location accurate			
19.1.3	Vein, veinlet, or mineralized stringer—Identity and existence certain, location approximate			
19.1.4	Vein, veinlet, or mineralized stringer—Identity or existence questionable, location approximate			
19.1.5	Vein, veinlet, or mineralized stringer—Identity and existence certain, location concealed			
19.1.6	Vein, veinlet, or mineralized stringer—Identity or existence questionable, location concealed			
19.1.7	Vein, veinlet, or mineralized stringer—Showing type of mineral occurrence			
19.1.8	Inclined vein, veinlet, or mineralized stringer (1st option)—Showing dip value and direction			Place tick, arrow, or other line-symbol decoration where observation was made. Add arrowhead or '90' to ticks showing dip if necessary for clarity.
19.1.9	Inclined vein, veinlet, or mineralized stringer (2nd option)—Showing dip value and direction			
19.1.10	Vertical or near-vertical vein, veinlet, or mineralized stringer (1st option)			
19.1.11	Vertical or near-vertical vein, veinlet, or mineralized stringer (2nd option)			
19.1.12	Small, minor inclined vein, veinlet, or mineralized stringer—Showing strike and dip			May also be shown in black or other colors.
19.1.13	Small, minor vertical or near-vertical vein, veinlet, or mineralized stringer—Showing strike			
19.1.14	Zone of mineralized or altered rock (1st option)			Add labels to show specific types of alteration. May be used alone or may overprint other mapped units. May also be shown in black or other colors.
19.1.15	Zone of mineralized or altered rock (2nd option)			
19.1.16	Zone of mineralized or altered rock, showing high level of mineralization			
19.1.17	Zone of mineralized or altered rock, showing low level of mineralization			
19.1.18	Area of identified resources			Usually reserved for use on special-purpose maps, not on general-purpose geologic maps. Generally shown in red, but may also be shown in black or other colors.
19.1.19	Area of high mineral resource potential			
19.1.20	Area of moderate mineral resource potential			
19.1.21	Area of low mineral resource potential			
19.1.22	Area considered to have mineral resource potential but not evaluated, mostly because of inadequate data			
19.1.23	Metamorphic facies boundary—Showing approximate boundary between diagnostic mineral assemblages			May also be shown in black or other colors.

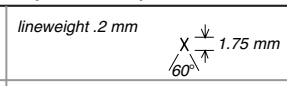
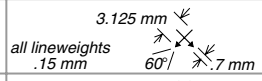
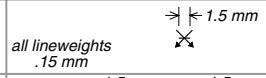
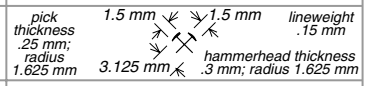
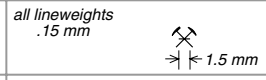
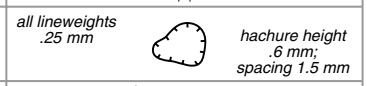
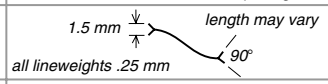
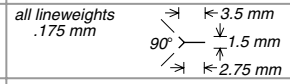
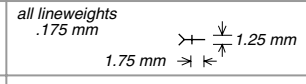
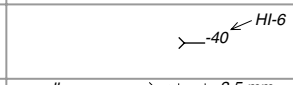
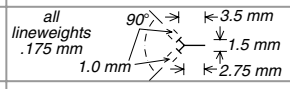
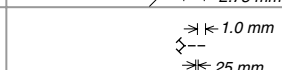
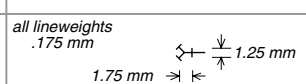
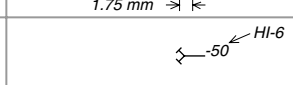
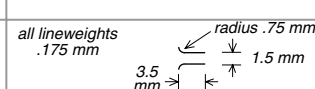
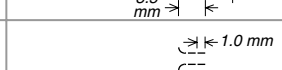
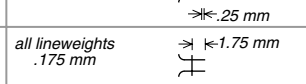
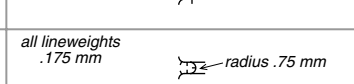
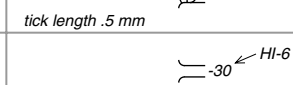
*For more information, see general guidelines on pages A-i to A-v.

19—NATURAL RESOURCES (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
19.2—Areas of extensively disturbed ground; surface workings; subsurface workings projected to surface				
19.2.1	Graded area—Extensive amount of mapped geologic unit has been removed			Patterns should overlay other mapped units. Generally shown in black or red, but may also be shown in brown or other colors.
19.2.2	Strip mine (1st option)			
19.2.3	Strip mine (2nd option)			
19.2.4	Artificial fill—Earth materials			Show as separately mapped units. Generally shown in black or red, but may also be shown in other colors.
19.2.5	Artificial fill—Human-generated refuse (landfill)			
19.2.6	Tailings			Symbols should overlay other mapped units. Generally shown in red or black, but may also be shown in brown or other colors.
19.2.7	Mine dump (1st option)			
19.2.8	Mine dump (2nd option)			
19.2.9	Mine dump bench			
19.2.10	Subsurface workings, projected to surface (1st option)			Different symbols may be used to show different levels of workings.
19.2.11	Subsurface workings, projected to surface (2nd option)			Symbols should overlay other mapped units. Generally shown in red, but may also be shown in black or other colors.
19.2.12	Subsurface workings, projected to surface (3rd option)			
19.2.13	Subsurface workings, projected to surface (4th option)			
19.2.14	Subsurface workings, projected to surface (5th option)			
19.2.15	Subsurface workings, projected to surface (6th option)			

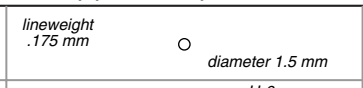
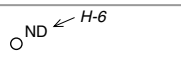
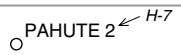
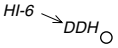
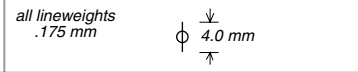
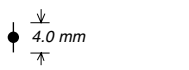
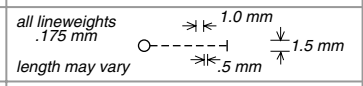
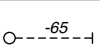
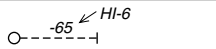
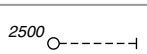
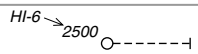
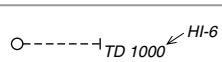
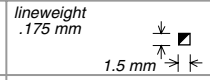
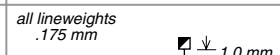
**For more information, see general guidelines on pages A-i to A-v.*

19—NATURAL RESOURCES (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
19.3—Mining and mineral exploration (at surface)				
19.3.1	Prospect (pit or small open cut)			
19.3.2	Sand, gravel, clay, or placer pit			
19.3.3	Abandoned sand, gravel, clay, or placer pit			
19.3.4	Open pit, quarry, or glory hole			
19.3.5	Abandoned open pit, quarry, or glory hole			
19.3.6	Open pit or quarry (mapped to scale)			
19.3.7	Trench (generalized trace)			
19.3.8	Trench (drawn to scale)			
19.3.9	Adit or tunnel entrance (1st option)			Long line points in direction of adit or tunnel entrance at surface.
19.3.10	Approximately located adit or tunnel entrance (1st option)			Map position of adit or tunnel entrance is at intersection of long line and two short lines.
19.3.11	Destroyed adit or tunnel entrance (1st option)			
19.3.12	Abandoned or inaccessible adit or tunnel entrance (1st option)			
19.3.13	Adit or tunnel entrance (1st option)—Showing angle of inclination (negative value indicates downward slope)	-40		Angle of inclination may be added to any adit or tunnel entrance symbol.
19.3.14	Adit or tunnel entrance (2nd option)			Long line points in direction of adit or tunnel entrance at surface.
19.3.15	Approximately located adit or tunnel entrance (2nd option)			Map position of adit or tunnel entrance is at intersection of long line and two short lines.
19.3.16	Destroyed adit or tunnel entrance (2nd option)			
19.3.17	Abandoned or inaccessible adit or tunnel entrance (2nd option)			
19.3.18	Adit or tunnel entrance (2nd option)—Showing angle of inclination (negative value indicates downward slope)	 -50		Angle of inclination may be added to any adit or tunnel entrance symbol.
19.3.19	Portal			Long lines point in direction of portal entry at surface.
19.3.20	Approximately located portal			Map position of portal entry is between the two lines, at the position where the short curved lines intersect the long lines.
19.3.21	Destroyed portal			
19.3.22	Abandoned or inaccessible portal			
19.3.23	Portal and open cut			Open cut may be added to any portal symbol.
19.3.24	Portal—Showing angle of inclination (negative value indicates downward slope)	-30		Angle of inclination may be added to any portal symbol.

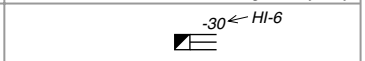
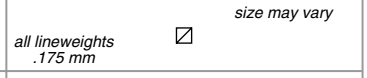
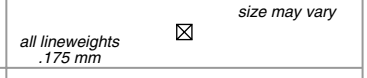
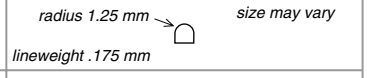
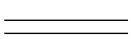
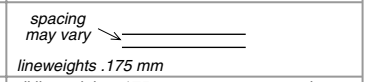
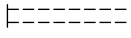
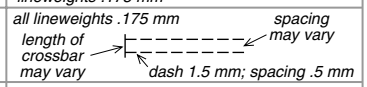
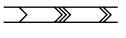
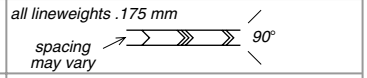
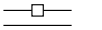
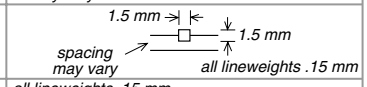
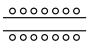
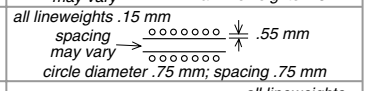
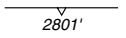
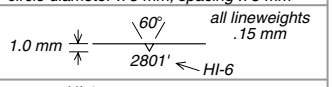
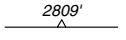
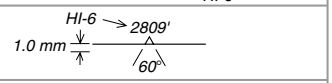
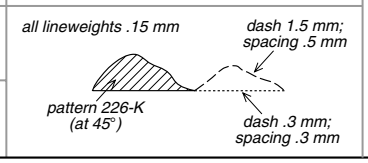
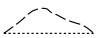
For more information, see general guidelines on pages A-i to A-v.

19—NATURAL RESOURCES (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
19.3—Mining and mineral exploration (at surface) (continued)				
19.3.25	Drill hole for mineral exploration			
19.3.26	Drill hole for mineral exploration—No geologic data available			
19.3.27	Drill hole for mineral exploration—Showing name and number			
19.3.28	Drill hole for mineral exploration—Showing type (DDH, diamond drill hole)			
19.3.29	Drill hole for exploration of low-grade ore			
19.3.30	Drill hole for exploration of high-grade ore			
19.3.31	Inclined drill hole for mineral exploration—Showing location of collar (circle) and projected trace (dashed line) and bottom (T) of drill hole			Projected trace of drill hole, angle of inclination, surface altitude, and total depth may be added to any drill hole symbol.
19.3.32	Inclined drill hole for mineral exploration—Showing angle of inclination (negative value indicates downward slope)			
19.3.33	Inclined drill hole for mineral exploration—Showing surface altitude of collar (in meters)			
19.3.34	Inclined drill hole for mineral exploration—Showing total depth of drill hole (in meters)			
19.3.35	Vertical mine shaft, as shown on smaller scale or general-purpose maps			
19.3.36	Multiple vertical mine shafts, as shown on smaller scale or general-purpose maps			
19.3.37	Abandoned or inaccessible vertical mine shaft, as shown on smaller scale or general-purpose maps			
19.3.38	Inclined mine shaft, as shown on smaller scale or general-purpose maps—Showing direction of inclination			
19.3.39	Inclined mine shaft, as shown on smaller scale or general-purpose maps—Showing angle of inclination (negative value indicates downward slope)			

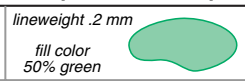
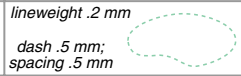
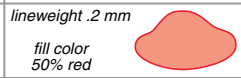
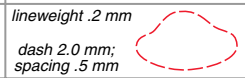
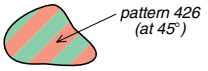
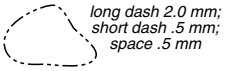
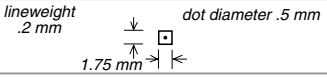
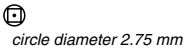
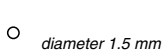
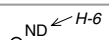
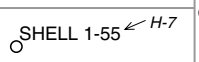
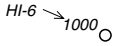
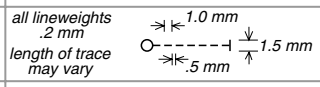
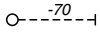
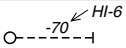
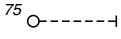
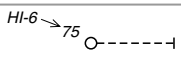
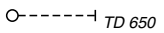
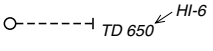
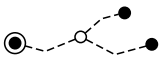
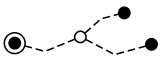
**For more information, see general guidelines on pages A-i to A-v.*

19—NATURAL RESOURCES (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
	19.4—Mines and subsurface workings			
19.4.1	Vertical mine shaft at surface (drawn to scale), as shown on subsurface exploration maps			
19.4.2	Inclined mine shaft at surface (drawn to scale), as shown on subsurface exploration maps—Showing direction of inclination			
19.4.3	Inclined mine shaft at surface (drawn to scale), as shown on subsurface exploration maps—Showing angle of inclination (negative value indicates downward slope)			
19.4.4	Mine shaft, above and below level (drawn to scale), as shown on subsurface exploration maps			
19.4.5	Bottom of mine shaft (drawn to scale), as shown on subsurface exploration maps			
19.4.6	Winze or head of raise (drawn to scale), as shown on subsurface exploration maps			
19.4.7	Raise or winze extending through level (drawn to scale), as shown on subsurface exploration maps			
19.4.8	Raise or foot of winze (drawn to scale), as shown on subsurface exploration maps			
19.4.9	Crosscut tunnel or intersection of workings (drawn to scale), as shown on subsurface exploration maps			
19.4.10	Workings (drawn to scale), as shown on subsurface exploration maps			
19.4.11	Caved or otherwise inaccessible workings (drawn to scale), as shown on subsurface exploration maps			
19.4.12	Inclined workings, as shown on subsurface exploration maps (drawn to scale)—Chevrons point downslope (multiple chevrons indicate steeper slope)			
19.4.13	Ore chute (drawn to scale), as shown on subsurface exploration maps			
19.4.14	Lagging or cribbing along drift (drawn to scale), as shown on subsurface exploration maps			
19.4.15	Elevation of roof or back, as shown on subsurface exploration maps			
19.4.16	Elevation of floor or sill, as shown on subsurface exploration maps			
19.4.17	Stoped area (drawn to scale), as shown on subsurface exploration maps (section view)			
19.4.18	Inferred stoped area (drawn to scale), as shown on subsurface exploration maps (section view)			

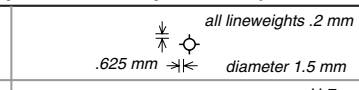
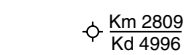
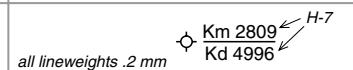
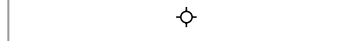
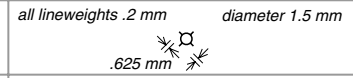
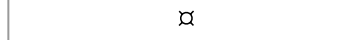
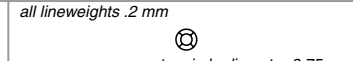
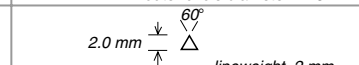
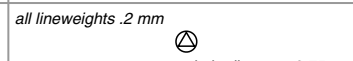
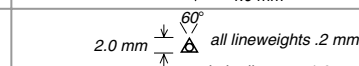
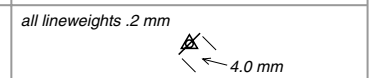
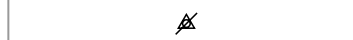
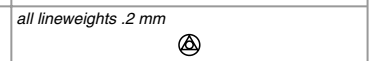
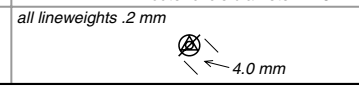
**For more information, see general guidelines on pages A-i to A-v.*

19—NATURAL RESOURCES (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
19.5—Oil and gas fields; wells drilled for hydrocarbon exploration or exploitation				
19.5.1	Oil field—Extent defined			Patterned areas (extent defined) should be shown as separately mapped units. Outlined areas (extent not yet defined) should overlay other mapped units. Generally shown in red and (or) green, but may also be shown in other colors or patterns.
19.5.2	Oil field—Extent not yet defined			
19.5.3	Gas field—Extent defined			
19.5.4	Gas field—Extent not yet defined			
19.5.5	Oil and gas field—Extent defined			
19.5.6	Oil and gas field—Extent not yet defined			
19.5.7	Core (nonspecific depth)			May also be shown in other colors.
19.5.8	Shallow core			Use if both shallow and deep cores are shown on map. May also be shown in other colors.
19.5.9	Deep core			
19.5.10	Drilling well or well location for hydrocarbon exploration or exploitation			Name, number, and total depth may be added to any type of well symbol. May also be shown in green (oil), red (gas), or other colors.
19.5.11	Drill hole for hydrocarbon exploration or exploitation—No data available			
19.5.12	Drill hole for hydrocarbon exploration or exploitation—Showing name and number			
19.5.13	Drill hole for hydrocarbon exploration or exploitation—Showing total depth (in meters)			
19.5.14	Inclined drill hole for hydrocarbon exploration or exploitation—Showing location of collar (circle) and projected trace (dashed line) and bottom (T) of drill hole			Projected trace of drill hole, angle of inclination, surface altitude, and total depth may be added to any type of well symbol. May also be shown in green (oil), red (gas), or other colors.
19.5.15	Inclined drill hole for hydrocarbon exploration or exploitation—Showing angle of inclination			
19.5.16	Inclined drill hole for hydrocarbon exploration or exploitation—Showing surface altitude of collar (in meters)			
19.5.17	Inclined drill hole for hydrocarbon exploration or exploitation—Showing total depth of drill hole (in meters)			
19.5.18	Multiple wells drilled from single platform—Showing location of collar (open circle) on platform. Types of wells indicated at drill hole bottoms			Any type of well symbol may be shown at bottoms of drill holes.

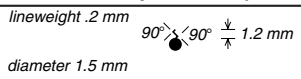
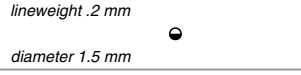
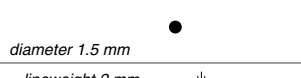
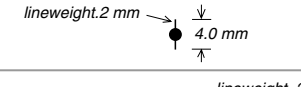
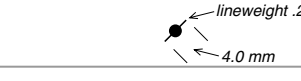
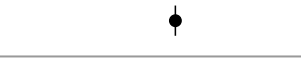
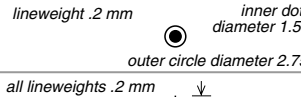
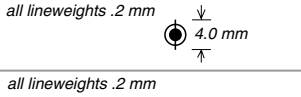
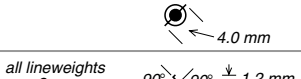
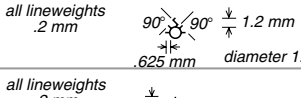
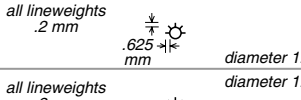
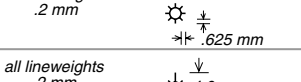
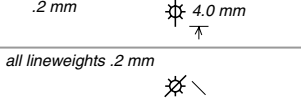
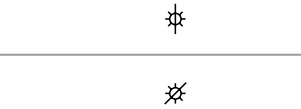
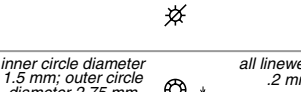
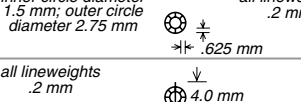
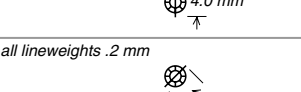
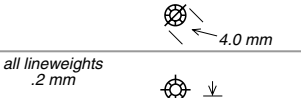
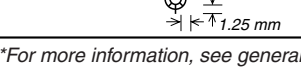
**For more information, see general guidelines on pages A-i to A-v.*

19—NATURAL RESOURCES (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
19.5—Oil and gas fields; wells drilled for hydrocarbon exploration or exploitation (continued)				
19.5.19	Dry hole (nonspecific depth)			May also be shown in other colors.
19.5.20	Dry hole—Showing map unit at surface (Km) and at bottom of hole (Kd). Also showing altitude at surface and total depth of hole (in meters)			
19.5.21	Shallow dry hole			Use if both shallow and deep dry holes are shown on map.
19.5.22	Deep dry hole			May also be shown in other colors.
19.5.23	Junked hole (nonspecific depth)			May also be shown in other colors.
19.5.24	Shallow junked hole			Use if both shallow and deep junked holes are shown on map.
19.5.25	Deep junked hole			May also be shown in other colors.
19.5.26	Disposal well (nonspecific depth)			May also be shown in other colors.
19.5.27	Plugged and abandoned disposal well (nonspecific depth)			
19.5.28	Shallow disposal well			Use if both shallow and deep disposal wells are shown on map.
19.5.29	Plugged and abandoned shallow disposal well			May also be shown in other colors.
19.5.30	Deep disposal well			
19.5.31	Plugged and abandoned deep disposal well			
19.5.32	Salt-water disposal well (nonspecific depth)			May also be shown in other colors.
19.5.33	Plugged and abandoned salt-water disposal well (nonspecific depth)			
19.5.34	Shallow salt-water disposal well			Use if both shallow and deep salt-water disposal wells are shown on map.
19.5.35	Plugged and abandoned shallow salt-water disposal well			May also be shown in other colors.
19.5.36	Deep salt-water disposal well			
19.5.37	Plugged and abandoned deep salt-water disposal well			

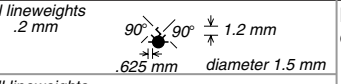
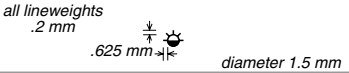
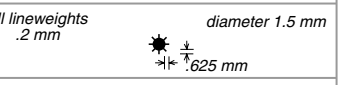
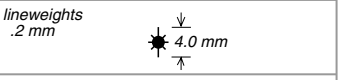
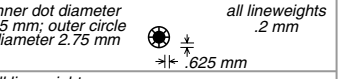
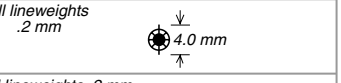
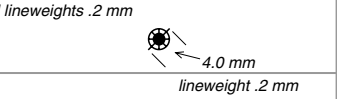
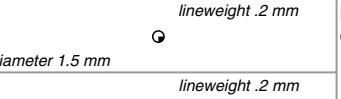
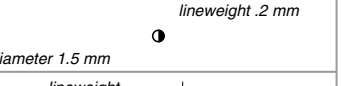
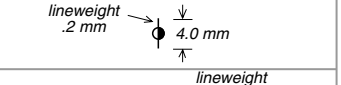
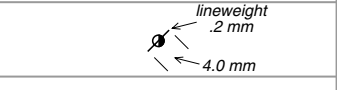
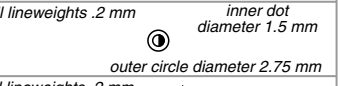
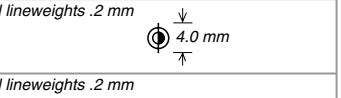
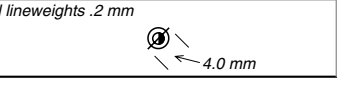
**For more information, see general guidelines on pages A-i to A-v.*

19—NATURAL RESOURCES (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
19.5—Oil and gas fields; wells drilled for hydrocarbon exploration or exploitation (continued)				
19.5.38	Oil seep			May also be shown in green or other colors.
19.5.39	Oil show			
19.5.40	Oil well (nonspecific depth)			
19.5.41	Suspended oil well (nonspecific depth)			
19.5.42	Plugged and abandoned oil well (nonspecific depth)			
19.5.43	Shallow oil well			Use if both shallow and deep oil wells are shown on map.
19.5.44	Suspended shallow oil well			May also be shown in green or other colors.
19.5.45	Plugged and abandoned shallow oil well			
19.5.46	Deep oil well			
19.5.47	Suspended deep oil well			
19.5.48	Plugged and abandoned deep oil well			
19.5.49	Gas seep			May also be shown in red or other colors.
19.5.50	Gas show			
19.5.51	Gas well (nonspecific depth)			
19.5.52	Suspended gas well (nonspecific depth)			
19.5.53	Plugged and abandoned gas well (nonspecific depth)			
19.5.54	Shallow gas well			Use if both shallow and deep gas wells are shown on map.
19.5.55	Suspended shallow gas well			May also be shown in red or other colors.
19.5.56	Plugged and abandoned shallow gas well			
19.5.57	Deep gas well			
19.5.58	Suspended deep gas well			
19.5.59	Plugged and abandoned deep gas well			
19.5.60	Deep gas well, plugged back and producing shallow gas			May also be shown in red or other colors.

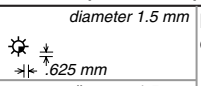
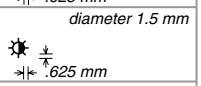
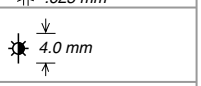
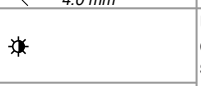
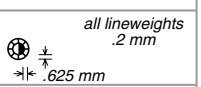
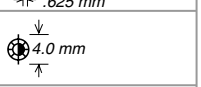
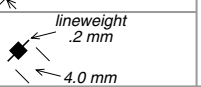
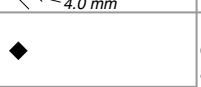
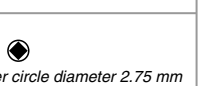
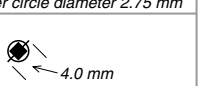
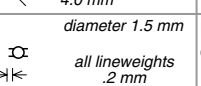
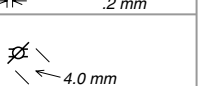
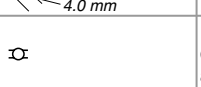
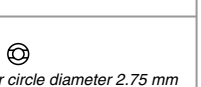
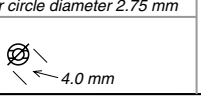
For more information, see general guidelines on pages A-i to A-v.

19—NATURAL RESOURCES (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
19.5—Oil and gas fields; wells drilled for hydrocarbon exploration or exploitation (continued)				
19.5.61	Oil and gas seep			May also be shown in other colors.
19.5.62	Oil and gas show			
19.5.63	Oil and gas well (nonspecific depth)			
19.5.64	Suspended oil and gas well (nonspecific depth)			
19.5.65	Plugged and abandoned oil and gas well (nonspecific depth)			
19.5.66	Shallow oil and gas well			Use if both shallow and deep oil and gas wells are shown on map.
19.5.67	Suspended shallow oil and gas well			May also be shown in other colors.
19.5.68	Plugged and abandoned shallow oil and gas well			
19.5.69	Deep oil and gas well			
19.5.70	Suspended deep oil and gas well			
19.5.71	Plugged and abandoned deep oil and gas well			
19.5.72	Condensate show			May also be shown in other colors.
19.5.73	Condensate well (nonspecific depth)			
19.5.74	Suspended condensate well (nonspecific depth)			
19.5.75	Plugged and abandoned condensate well (nonspecific depth)			
19.5.76	Shallow condensate well			Use if both shallow and deep condensate wells are shown on map.
19.5.77	Suspended shallow condensate well			May also be shown in other colors.
19.5.78	Plugged and abandoned shallow condensate well			
19.5.79	Deep condensate well			
19.5.80	Suspended deep condensate well			
19.5.81	Plugged and abandoned deep condensate well			

**For more information, see general guidelines on pages A-i to A-v.*

19—NATURAL RESOURCES (continued)

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
19.5—Oil and gas fields; wells drilled for hydrocarbon exploration or exploitation (continued)				
19.5.82	Gas and condensate show			May also be shown in other colors.
19.5.83	Gas and condensate well (nonspecific depth)			
19.5.84	Suspended gas and condensate well (nonspecific depth)			
19.5.85	Plugged and abandoned gas and condensate well (nonspecific depth)			
19.5.86	Shallow gas and condensate well			Use if both shallow and deep gas and condensate wells are shown on map. May also be shown in other colors.
19.5.87	Suspended shallow gas and condensate well			
19.5.88	Plugged and abandoned shallow gas and condensate well			
19.5.89	Deep gas and condensate well			
19.5.90	Suspended deep gas and condensate well			
19.5.91	Plugged and abandoned deep gas and condensate well			
19.5.92	Gas storage well (nonspecific depth)			May also be shown in other colors.
19.5.93	Plugged and abandoned gas storage well (nonspecific depth)			
19.5.94	Shallow gas storage well			Use if both shallow and deep gas storage wells are shown on map. May also be shown in other colors.
19.5.95	Plugged and abandoned shallow gas storage well			
19.5.96	Deep gas storage well			
19.5.97	Plugged and abandoned deep gas storage well			
19.5.98	Observation well for gas-storage field (nonspecific depth)			May also be shown in other colors.
19.5.99	Plugged and abandoned observation well for gas-storage field [nonspecific depth]			
19.5.100	Shallow observation well for gas-storage field			Use if both shallow and deep observation wells are shown on map. May also be shown in other colors.
19.5.101	Plugged and abandoned shallow observation well for gas-storage field			
19.5.102	Deep observation well for gas-storage field			
19.5.103	Plugged and abandoned deep observation well for gas-storage field			

**For more information, see general guidelines on pages A-i to A-v.*