

GEOLOGIC LOG OF DRILL HOLE NO. MW-09-121

FEATURE: Groundwater Monitoring
 LOCATION: Reach 5, River Bank Left, Merced County
 BEGUN: 11/16/09 FINISHED: 11/16/09
 DEPTH AND ELEVATION OF WATER LEVEL
 AND DATE MEASURED: 6.2 ft. (El. 58.54 ft.) 11/16/2009

PROJECT: San Joaquin River Restoration Project
 COORDINATES: N 2,364,957.5 E 5,999,424.0 (NAGD83)
 TOTAL DEPTH: 50.0 ft.

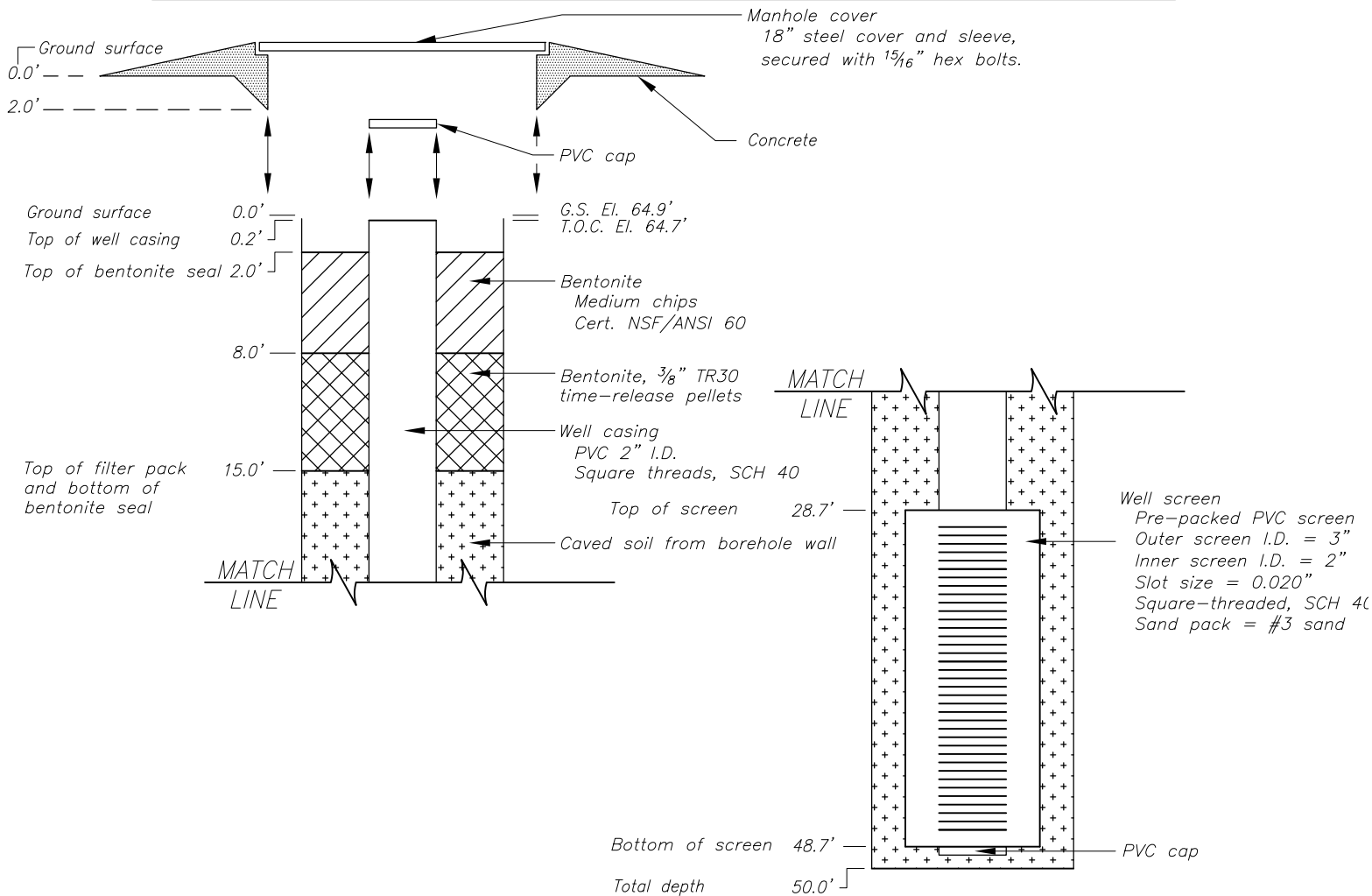
STATE: California
 GROUND SURFACE ELEVATION: 64.9 ft. (NAVD88)
 T.O.C ELEVATION: 64.74 ft. (NAVD88)
 HOLE LOGGED BY: J. Vauk
 REVIEWED BY: A. Warren

| NOTES | DEPTH | % CORE RECOVERY | LABORATORY DATA | | | | | | | LABORATORY CLASSIFICATION | ELEVATION | VISUAL CLASSIFICATION | ELEVATION | GEOLOGIC UNIT SYMBOL | CLASSIFICATION AND PHYSICAL CONDITION |
|-------|----------------|-----------------|-----------------|--------|---------|--------|----------|--------------|------------------|---------------------------|-----------|-----------------------|--------------|----------------------|---|
| | | | % SILT | % CLAY | % FINES | % SAND | % GRAVEL | LIQUID LIMIT | PLASTICITY INDEX | | | | | | |
| | 0 | | | | | | | | | | | | | | 45.0 to 46.3 ft.: POORLY GRADED SAND WITH SILT, SP/SM: About 90% fine sand; about 10% non-plastic fines with rapid dilatancy; maximum size: fine sand; wet, gray, no reaction with HCl; soft consistency. <u>Laboratory Data Interval</u> 45.0 to 46.3 ft. |
| | 30 | | | | | | | | | | | | | | |
| | 0 | | | | | | | | | | | | | | 46.5 to 50.0 ft.: No Recovery - SILTY SAND, SM Description based on drilling conditions and an adjacent CPT (CPT-09-121). T.D. = 50.0 ft. |
| | 35 | | | | | | | | | | SM | | | | |
| | 0 | | | | | | | | | | | | | | |
| | 40 | | | | | | | | | | | | | | |
| | 0 | | | | | | | | | | | | | | |
| | 45 | | | | | | | | | | | 19.7 | | | |
| | | | 4.0 | 2.8 | 6.8 | 93.2 | 0.0 | NP | NP | 27.1 | SP-SM | SP/SM | | | |
| | | | 35.8 | 47.4 | 83.2 | 16.8 | 0.0 | 45.0 | 24.2 | 47.9 | (CL) s | 18.4 18.2 | 18.4 18.2 | | |
| | 30 | | | | | | | | | | | | | | |
| | 0 | | | | | | | | | | | | | | |
| | 45 | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | |
| | BOTTOM OF HOLE | | | | | | | | | | | | | | |

COMMENTS: FADC = Flight Auger Dry Core
 HSA = Hollow Stem Auger
 NP = Non-plastic
 NR = No Recovery
 NA = Not applicable
 G.S. = Ground surface
 b.g.s. = Below the ground surface
 T.O.C. = Top of well casing

Well completion information is provided in attached Well Completion Diagram. Well development information is provided in attached Monitoring Well Development form.

| | |
|--|---------------------|
| MW-09-121 | GEOLOGIST: J. VAUK |
| WELL COMPLETION DIAGRAM | DRILLER: K. COY |
| DATE COMPLETED: 11/16/2009 | HELPER: E. GONZALES |
| TOP OF WELL CASING COORDINATES: N2364957.5 E5999424.0 (NAD83) ELEVATION 64.7' (NAVD88) GROUND SURFACE ELEVATION 64.9' (NAVD88) | |



*NOT TO SCALE

NOTES:

T.O.C. = Top of well casing, I.D. = Inner Diameter, G.S. = Ground Surface, El. = Elevation

Drill hole was terminated at 50.0' b.g.s. Sand heave filled augers to about 46.0'. Drill hole was cleaned out to 49.2'. Screen was set at 49.2'. Natural material backfilled around screen and well casing from bottom to 15.0'.

Bentonite pellets were poured into augers at 15.0' and dropped when augers were lifted up to 8.0'. Hole stayed open from 8.0' to surface and chips were poured into open hole.

Sand backfills the well above the top of bentonite seal, inside the manhole.

GEOLOGIC LOG OF DRILL HOLE NO. MW-09-123

FEATURE: Groundwater Monitoring
 LOCATION: Reach 5, River Bank Left, Merced County
 BEGUN: 11/13/09 FINISHED: 11/14/09
 DEPTH AND ELEVATION OF WATER LEVEL
 AND DATE MEASURED: 10.9 ft. (El. 59.00 ft.) 11/14/2009

PROJECT: San Joaquin River Restoration Project
 COORDINATES: N 2,365,513.5 E 6,000,144.7 (NAGD83)
 TOTAL DEPTH: 54.8 ft.

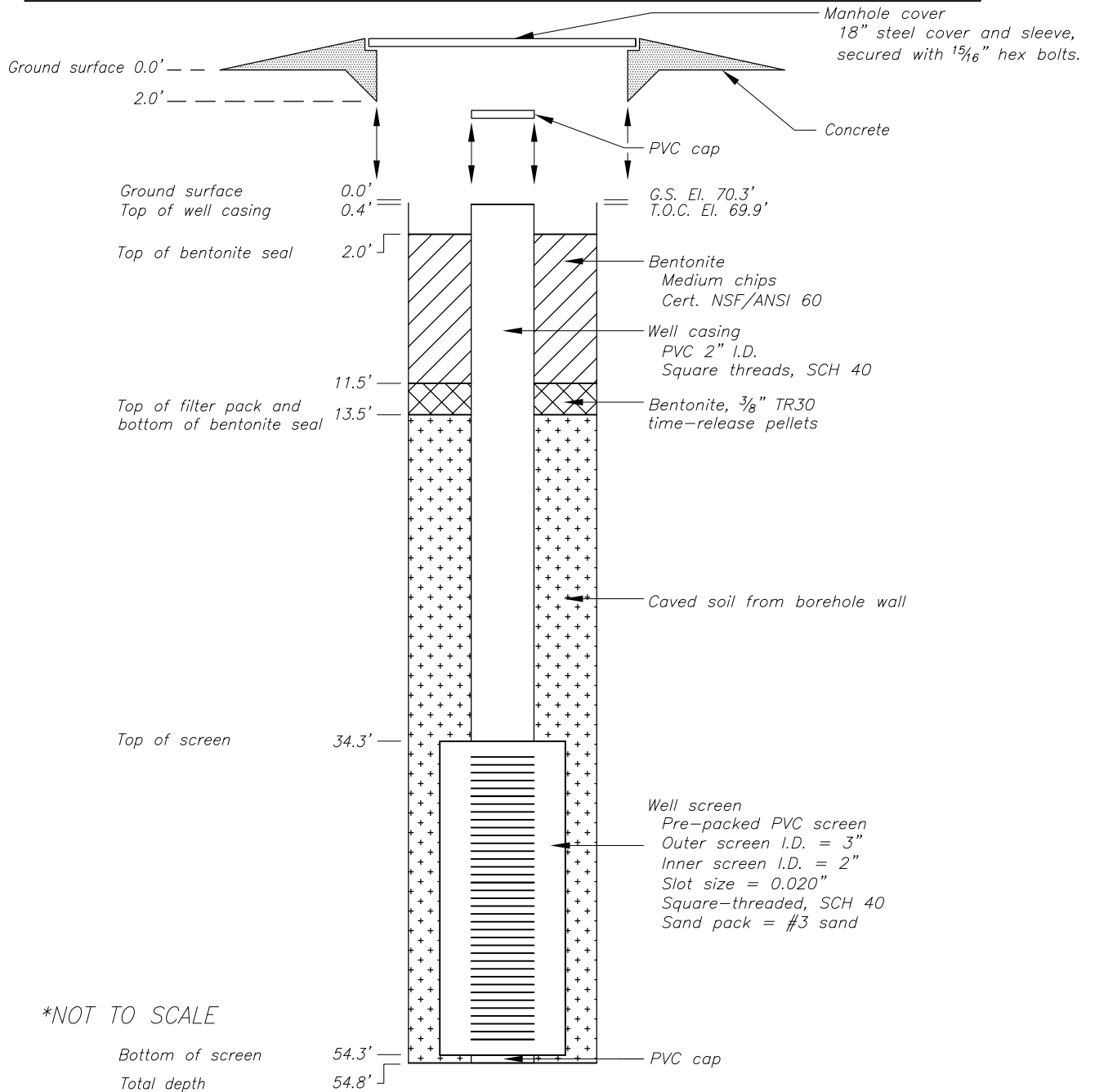
STATE: California
 GROUND SURFACE ELEVATION: 70.3 ft. (NAVD88)
 T.O.C ELEVATION: 69.90 ft. (NAVD88)
 HOLE LOGGED BY: J. Vauk
 REVIEWED BY: A. Warren

| NOTES | DEPTH | LABORATORY DATA | | | | | | | | LABORATORY CLASSIFICATION | ELEVATION | VISUAL CLASSIFICATION | ELEVATION | GEOLOGIC UNIT SYMBOL | CLASSIFICATION AND PHYSICAL CONDITION |
|---|-------|-----------------|--------|--------|---------|--------|----------|--------------|------------------|---------------------------|-----------|--|--|----------------------|---------------------------------------|
| | | % CORE RECOVERY | % SILT | % CLAY | % FINES | % SAND | % GRAVEL | LIQUID LIMIT | PLASTICITY INDEX | | | | | | |
| <p>ALL MEASUREMENTS ARE IN FEET FROM THE GROUND SURFACE.</p> <p>PURPOSE OF HOLE: To recover core, collect data to determine geologic and hydrologic site conditions, and install a groundwater monitoring well.</p> <p>DRILLED BY: USGS Drill Crew Kevin Coy, Driller Ernie Gonzales, Helper</p> <p>DRILL RIG: CME-550</p> <p>DRILLING & SAMPLING METHODS: Drill hole MW-09-123 was advanced using hollow stem flight augers dry core system (FADC) with a 7-5/8-inch O.D., and 4-1/4-inch I.D., and a 5-foot-long, 3-inch I.D. split sample barrel.</p> <p><u>Interval Method</u> 0.0 to 54.8 ft. - FADC</p> <p>DRILLING CONDITIONS AND DRILLER'S COMMENTS: 0.0 to 17.5 ft. - smooth drilling 17.5 to 24.5 ft. - add water, wet soils 24.5 to 54.8 ft. - difficult recovery conditions, poor recovery</p> <p>DRILL FLUID, RETURN AND COLOR: 0.0 to 17.5 ft. - None 17.5 to 54.8 ft. - Water, no return</p> <p>WATER LEVEL: 10.9 ft. from ground surface, on 11/14/09</p> <p>REASON FOR HOLE TERMINATION: The hole was terminated upon successful completion to the target depth.</p> <p>HOLE COMPLETION: Well Casing - 0.4 to 34.3 ft. (T.O.C. El. 69.90 ft.) Dual Pre-pack Screen - 34.3 to 54.3 ft. (Slotted 0.020-inch) Well Screen Filter Pack - #3 Sand Filter Pack - 13.5 to 54.8 ft. (Native material caved) Bentonite Seal - 2.0 to 13.5 ft. Well Protection - flush-mounted 18-inch manhole (15/16-inch hexbolts)</p> | 100 | | | | | | | | | | (ML)s | | <p>0.0 to 54.8 feet QUATERNARY ALLUVIUM (Qal)</p> <p>0.0 to 2.7 ft.: SILT WITH SAND, (ML)s: About 75% fines with low to medium plasticity, low toughness and dry strength, and slow dilatancy; about 25% fine sand; maximum size: fine sand; dry, dark brown, no reaction with HCl; soft consistency.</p> <p>2.7 to 2.9 ft.: SILTY SAND, SM: About 55% fine sand; about 45% non-plastic fines with rapid dilatancy; maximum size: fine sand; dry, medium brown, no reaction with HCl; soft consistency.</p> <p>2.9 to 4.1 ft.: SILT, ML: About 95% fines with medium plasticity, low toughness and dry strength, and slow dilatancy; about 5% fine sand; maximum size: fine sand; dry, dark brown, no reaction with HCl; soft consistency.</p> <p>4.1 to 6.2 ft.: SILT WITH SAND, (ML)s: About 75% non-plastic fines with rapid dilatancy; about 25% fine sand; maximum size: fine sand; dry, medium brown, no reaction with HCl; soft consistency.</p> <p>6.2 to 6.6 ft.: SILTY SAND, SM: About 80% fine to medium sand; about 20% non-plastic fines with rapid dilatancy; maximum size: medium sand; dry, light brown to light gray, no reaction with HCl.</p> <p><u>Laboratory Data Interval</u> 6.3 to 11.0 ft.</p> <p>6.6 to 11.0 ft.: SILTY SAND, SM: About 80% fine to medium sand; about 20% non-plastic fines with rapid dilatancy; maximum size: medium sand; dry, medium brown and light gray, no reaction with HCl.</p> <p>7.0 to 11.0 ft.: SILTY SAND, SM: About 80% fine to medium sand; about 20% non-plastic fines with rapid dilatancy; maximum size: medium sand; dry, light gray, no reaction with HCl.</p> <p>11.0 to 24.5 ft.: POORLY GRADED SAND WITH SILT, SP/SM: About 90% fine to medium sand (mostly fine); about 10% non-plastic fines with rapid dilatancy; maximum size: medium sand; moist, orange brown (iron-oxide stained) and gray, no reaction with HCl.</p> <p><u>Laboratory Data Interval</u> 11.0 to 17.5 ft. 19.5 to 24.5 ft.</p> <p>24.5 to 33.4 ft.: No Recovery - SILTY SAND, SM: Description is based on drilling conditions and an adjacent CPT (CPT-09-123).</p> <p>33.4 to 33.8 ft.: SILTY SAND, SM: About 75% fine to medium sand; about 25% non-plastic fines with rapid dilatancy; maximum size: medium sand; wet, greenish-gray, no reaction with HCl.</p> | | |
| | 96 | | | | | | | | | | | SM 67.2 67.0 | | | |
| | 90 | 7.1 | 2.9 | 10.0 | 90.0 | 0.0 | NP | NP | 5.9 | SP-SM | | ML 65.8 | | | |
| | 60 | 5.4 | 1.5 | 6.9 | 93.1 | 0.0 | NP | NP | 22.1 | SP-SM | | (ML)s 63.7 SM 63.3 | | | |
| | 20 | | | | | | | | | | | SM 58.9 10.9 ft. (El. 59.00 ft.) | | | |
| | 38 | 6.4 | 0.9 | 7.3 | 92.7 | 0.0 | NP | NP | 26.2 | SP-SM | | SM 52.4 | | | |
| | 25 | | | | | | | | | | | SP/SM 45.4 | | | |
| | 0 | | | | | | | | | | | SM | | | |

COMMENTS: FADC = Flight Auger Dry Core
 HSA = Hollow Stem Auger
 NP = Non-plastic
 NR = No Recovery
 NA = Not applicable
 G.S. = Ground surface
 b.g.s. = Below the ground surface
 T.O.C. = Top of well casing

Well completion information is provided in attached Well Completion Diagram. Well development information is provided in attached Monitoring Well Development form.

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| MW-09-123 | GEOLOGIST: J. VAUK |
| WELL COMPLETION DIAGRAM | DRILLER: K. COY |
| DATE COMPLETED: 11/14/2009 | HELPER: E. GONZALES |
| TOP OF WELL CASING COORDINATES: N2365513.5 E6000144.7 (NAD83) ELEVATION 69.9' (NAVD88) GROUND SURFACE ELEVATION 70.3' (NAVD88) | |



NOTES:

T.O.C. = Top of well casing, I.D. = Inner Diameter, G.S. = Ground Surface, El. = Elevation

Drill hole was terminated at 54.8'. Running sands (clean) were very difficult to sample, no confining clay or silt layers were encountered below.

Sand backfills the well above the top of bentonite seal, inside the manhole.

GEOLOGIC LOG OF DRILL HOLE NO. MW-09-124

FEATURE: Groundwater Monitoring
 LOCATION: Reach 5, River Bank Right, Merced County
 BEGUN: 11/17/09 FINISHED: 11/19/09
 DEPTH AND ELEVATION OF WATER LEVEL
 AND DATE MEASURED: 10.3 ft. (El. 59.60 ft.) 11/19/2009

PROJECT: San Joaquin River Restoration Project
 COORDINATES: N 2,365,953.6 E 6,000,779.3 (NAGD83)
 TOTAL DEPTH: 50.3 ft.

STATE: California
 GROUND SURFACE ELEVATION: 70.0 ft. (NAVD88)
 T.O.C ELEVATION: 69.90 ft. (NAVD88)
 HOLE LOGGED BY: J. Vauk
 REVIEWED BY: A. Warren

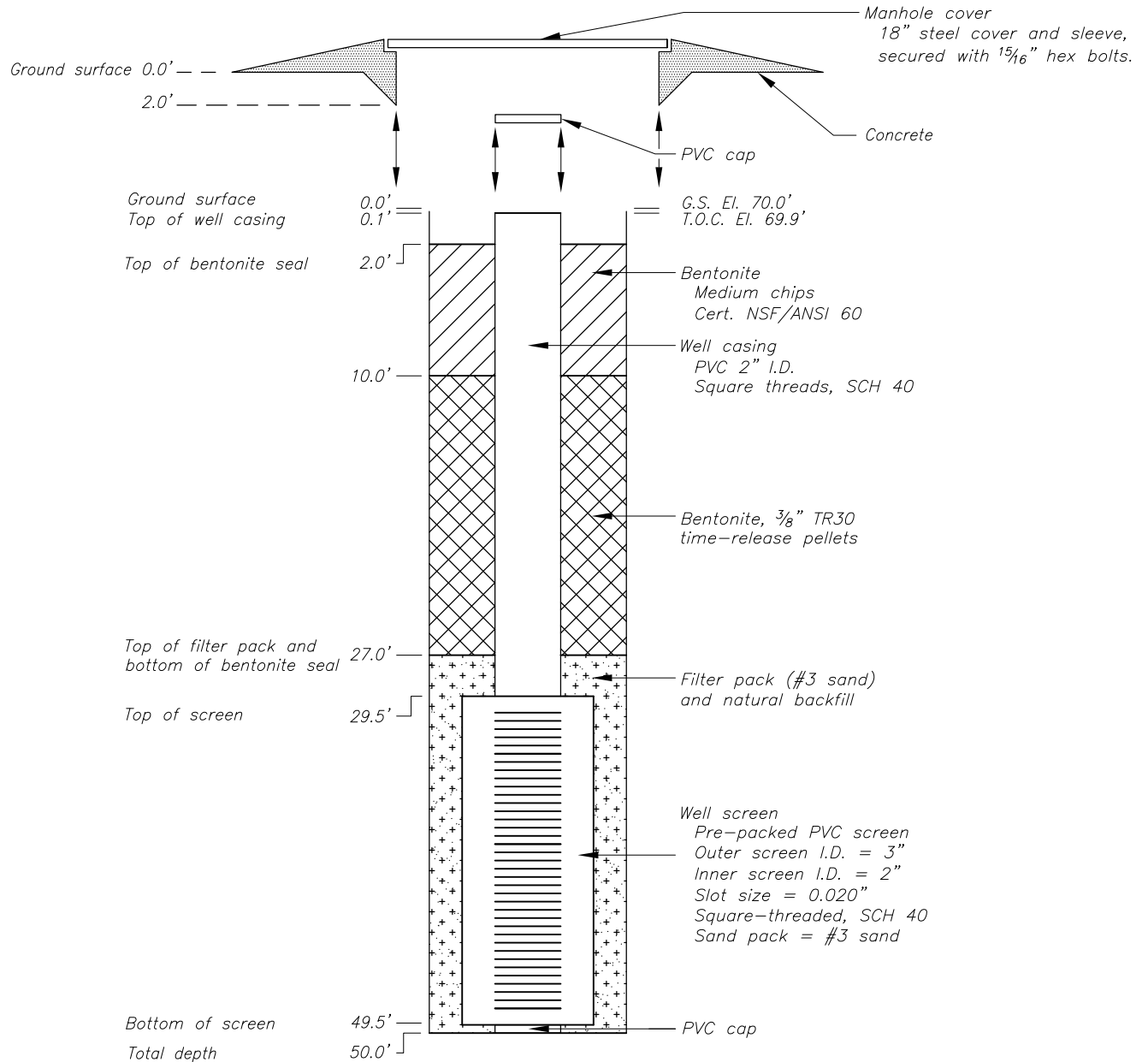
| NOTES | DEPTH | % CORE RECOVERY | LABORATORY DATA | | | | | | | LABORATORY CLASSIFICATION | ELEVATION | VISUAL CLASSIFICATION | ELEVATION | GEOLOGIC UNIT SYMBOL | CLASSIFICATION AND PHYSICAL CONDITION |
|-------|-------|-----------------|-----------------|--------|---------|--------|----------|--------------|------------------|---------------------------|-----------|-----------------------|--------------|----------------------|--|
| | | | % SILT | % CLAY | % FINES | % SAND | % GRAVEL | LIQUID LIMIT | PLASTICITY INDEX | | | | | | |
| | | | | | | | | | | | SM | 38.4 | | | 25.3 to 30.0 ft.: SILT WITH SAND, (ML)s: About 75% fines with low plasticity, toughness and dry strength, and slow dilatancy; about 25% fine sand; maximum size: fine sand; moist, gray, no reaction with HCl; soft consistency. <u>Laboratory Data Interval</u> 25.3 to 30.0 ft. |
| | 56 | | 3.4 | 0.0 | 3.4 | 96.6 | 0.0 | NP | NP | 23.4 | SP | | | | |
| | 35 | | | | | | | | | | | 34.9 | 34.9 | | 30.0 to 31.5 ft.: SILTY SAND, SM: About 80% fine to medium sand; about 20% non-plastic fines with rapid dilatancy; maximum size: medium sand; moist, gray, no reaction with HCl; soft consistency. 31.5 to 35.0 ft.: POORLY GRADED SAND, SP: About 95% fine to medium sand; about 5% non-plastic fines with rapid dilatancy; maximum size: medium sand; gray, no reaction with HCl; soft consistency; core loss throughout run, disturbed. <u>Laboratory Data Interval</u> 31.5 to 35.0 ft. |
| | 14 | | | | | | | | | | | | SM | | |
| | 40 | | | | | | | | | | | | 30.9 30.7 | | 35.0 to 39.0 ft.: No Recovery - SILTY SAND, SM: Description based on drilling conditions. 39.0 to 39.2 ft.: POORLY GRADED SAND, SP: About 95% fine to medium sand; about 5% non-plastic fines with rapid dilatancy; maximum size: medium sand; gray, no reaction with HCl; soft consistency; core loss throughout run, disturbed. 39.2 to 50.0 ft.: No Recovery - SILTY SAND, SM: Description based on drilling conditions. T.D. = 50.0 ft. |
| | 0 | | | | | | | | | | | | | | |
| | 45 | | | | | | | | | | | | | SM | |
| | 0 | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | 19.9 | | |

BOTTOM OF HOLE

COMMENTS: FADC = Flight Auger Dry Core
 HSA = Hollow Stem Auger
 NP = Non-plastic
 NR = No Recovery
 NA = Not applicable
 G.S. = Ground surface
 b.g.s. = Below the ground surface
 T.O.C. = Top of well casing

Well completion information is provided in attached Well Completion Diagram. Well development information is provided in attached Monitoring Well Development form.

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| MW-09-124 | GEOLOGIST: J. VAUK |
| WELL COMPLETION DIAGRAM | DRILLER: K. COY |
| DATE COMPLETED: 11/19/2009 | HELPER: E. GONZALES |
| TOP OF WELL CASING COORDINATES: N2365953.6 E6000779.3 (NAD83) ELEVATION 69.9' (NAVD88) GROUND SURFACE ELEVATION 70.0' (NAVD88) | |



*NOT TO SCALE

NOTES:

T.O.C. = Top of well casing, I.D. = Inner Diameter, G.S. = Ground Surface,
 El. = Elevation
 Sand backfills the well above the top of bentonite seal.

GEOLOGIC LOG OF DRILL HOLE NO. MW-09-125

FEATURE: Groundwater Monitoring
 LOCATION: Reach 5, River Bank Right, Merced County
 BEGUN: 11/19/09 FINISHED: 11/20/09
 DEPTH AND ELEVATION OF WATER LEVEL
 AND DATE MEASURED: 10.1 ft. (El. 63.99 ft.) 11/20/2009

PROJECT: San Joaquin River Restoration Project
 COORDINATES: N 2,367,038.9 E 6,004,739.0 (NAGD83)
 TOTAL DEPTH: 49.5 ft.

STATE: California
 GROUND SURFACE ELEVATION: 74.4 ft. (NAVD88)
 T.O.C ELEVATION: 74.09 ft. (NAVD88)
 HOLE LOGGED BY: J. Vauk
 REVIEWED BY: A. Warren

| NOTES | DEPTH | LABORATORY DATA | | | | | | | | LABORATORY CLASSIFICATION | ELEVATION | VISUAL CLASSIFICATION | ELEVATION | GEOLOGIC UNIT SYMBOL | CLASSIFICATION AND PHYSICAL CONDITION |
|---|-------|-----------------|--------|--------|---------|--------|----------|--------------|------------------|---------------------------|-----------|-----------------------|-----------|---|---------------------------------------|
| | | % CORE RECOVERY | % SILT | % CLAY | % FINES | % SAND | % GRAVEL | LIQUID LIMIT | PLASTICITY INDEX | | | | | | |
| <p>ALL MEASUREMENTS ARE IN FEET FROM THE GROUND SURFACE.</p> <p>PURPOSE OF HOLE: To recover core, collect data to determine geologic and hydrologic site conditions, and install a groundwater monitoring well.</p> <p>DRILLED BY: USGS Drill Crew Kevin Coy, Driller Ernie Gonzales, Helper</p> <p>DRILL RIG: CME-550</p> <p>DRILLING & SAMPLING METHODS: Drill hole MW-09-125 was advanced using hollow stem flight augers dry core system (FADC) with a 7-5/8-inch O.D., and 4-1/4-inch I.D., and a 5-foot-long 3-inch I.D. split sample barrel.</p> <p><u>Interval Method</u> 0.0 to 49.5 ft. - FADC</p> <p>DRILLING CONDITIONS AND DRILLER'S COMMENTS: 0.0 to 29.5 ft. - smooth drilling 29.5 to 34.5 ft. - difficult recovery conditions, poor recovery 34.5 to 39.5 ft. - smooth drilling 39.5 to 49.5 ft. - difficult recovery conditions, poor recovery</p> <p>DRILL FLUID, RETURN AND COLOR: 0.0 to 50.0 ft. - None</p> <p>WATER LEVEL: 10.1 ft. bgs, on 11/19/2009</p> <p>REASON FOR HOLE TERMINATION: The hole was terminated upon successful completion to the target depth.</p> <p>HOLE COMPLETION: Well Casing - 0.3 to 29.0 ft. (T.O.C. El. 74.09 ft.) Dual Pre-pack Screen - 29.0 to 49.0 ft. (Slotted 0.020-inch) Well Screen Filter Pack - #3 Sand Filter Pack - 25.0 to 49.5 ft. (#3 Sand) Bentonite Seal - 2.0 to 25.0 ft. Well Protection - flush-mounted 18-inch manhole (15/16-inch hexbolts)</p> | 80 | | | | | | | | | | SM | | | <p>0.0 to 49.5 feet QUATERNARY ALLUVIUM (Qal)</p> <p>0.0 to 5.2 ft.: SILTY SAND, SM: About 70% fine to medium sand; about 30% non-plastic fines with rapid dilatancy; maximum size: medium sand; moist, reddish-brown, no reaction with HCl; soft consistency; organics.</p> <p>5.2 to 6.9 ft.: SILTY SAND, SM: About 65% fine to medium sand (mostly fine); about 35% non-plastic fines with rapid dilatancy; maximum size: medium sand; moist, light brown, no reaction with HCl; soft consistency.</p> <p><u>Laboratory Data Interval</u> 5.2 to 6.9 ft.</p> <p>6.9 to 14.5 ft.: POORLY GRADED SAND WITH SILT, SP/SM: About 90% fine to medium sand; about 10% non-plastic fines with rapid dilatancy; maximum size: medium sand; moist, medium brown, no reaction with HCl; soft consistency.</p> <p><u>Laboratory Data Interval</u> 6.9 to 14.5 ft.</p> <p>14.5 to 19.5 ft.: No Recovery - SILTY SAND, SM: Description is based on drilling conditions and an adjacent CPT (CPT-09-125).</p> <p>19.5 to 23.2 ft.: POORLY GRADED SAND WITH SILT, SP/SM: About 90% fine to medium sand; about 10% non-plastic fines with rapid dilatancy; maximum size: medium sand; moist, medium brown, no reaction with HCl; soft consistency.</p> <p>23.2 to 24.1 ft.: SILTY SAND, SM: About 60% fine sand; about 40% non-plastic fines with rapid dilatancy; maximum size: fine sand; wet, gray, no reaction with HCl.</p> <p><u>Laboratory Data Interval</u> 23.2 to 24.1 ft.</p> <p>24.1 to 24.4 ft.: SILTY SAND, SM: About 55% fine sand; about 45% non-plastic fines with rapid dilatancy; maximum size: fine sand; wet, gray, no reaction with HCl; soft consistency.</p> <p>24.4 to 24.8 ft.: SILT, ML: About 90% fines with low plasticity, toughness and dry strength, and no dilatancy; about 10% fine sand; maximum size: fine sand; moist, gray, no reaction with HCl; soft consistency.</p> <p>24.8 to 24.9 ft.: SILT WITH SAND, (ML)s: About 85% fines with low plasticity, toughness and dry strength, and rapid dilatancy; about 15% fine sand; maximum size: fine sand; wet, gray, no reaction with HCl; soft consistency.</p> <p>24.9 to 25.7 ft.: SILTY SAND, SM: About 85% fine sand; about 15% non-plastic fines with rapid dilatancy; maximum size: fine sand; wet, brown, no reaction with HCl; soft consistency.</p> <p><u>Laboratory Data Interval</u> 24.9 to 25.7 ft.</p> | |
| | 5 | | | | | | | | | | | | 68.9 | | |
| | | | 23.3 | 10.4 | 33.7 | 66.3 | 0.0 | NP | NP | 11.2 | SM | SM | | | |
| | | 90 | | | | | | | | | | | 67.2 | | |
| | | 10 | | | | | | | | | | | | | |
| | | | 4.7 | 1.2 | 5.9 | 94.1 | 0.0 | NP | NP | 11.2 | SP-SM | SP/SM | | | |
| | | 44 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | 59.6 | | 59.6 |
| | | 15 | | | | | | | | | | | | | |
| | | 0 | | | | | | | | | | SM | | | |
| | | | | | | | | | | | | | | | 54.6 |
| | | 20 | | | | | | | | | | SP/SM | | | |
| | | 64 | | | | | | | | | | | | | 50.9 |
| | | | 48.2 | 12.7 | 60.9 | 38.9 | 0.2 | NP | NP | 24.1 | s(ML) | SM | 50.0 | | 50.0 |
| | | | | | | | | | | | | SM | 49.7 | | 49.7 |
| | | | | | | | | | | | ML | 49.3 | 49.3 | | |
| | | | | | | | | | | | (ML)s | 49.2 | 49.2 | | |
| | 25 | | | | | | | | | | SM | 48.4 | 48.4 | | |
| | | 8.5 | 4.4 | 12.9 | 87.1 | 0.0 | NP | NP | 27.8 | SM | (ML)s | 48.0 | 48.0 | | |
| | | | | | | | | | | | (ML)s | 48.0 | 48.0 | | |
| | 66 | | | | | | | | | | SP-SM | | | | |
| | | 4.8 | 3.7 | 8.5 | 91.5 | 0.0 | NP | NP | 22.9 | SP-SM | SP | | | | |
| | | | | | | | | | | | | 45.3 | 45.3 | | |
| | | | | | | | | | | | CL/ML | 45.0 | 45.0 | | |
| | | | | | | | | | | | s(ML) | 44.6 | 44.6 | | |

COMMENTS: FADC = Flight Auger Dry Core
 HSA = Hollow Stem Auger
 NP = Non-plastic
 NR = No Recovery
 NA = Not applicable
 G.S. = Ground surface
 b.g.s. = Below the ground surface
 T.O.C. = Top of well casing

Well completion information is provided in attached Well Completion Diagram. Well development information is provided in attached Monitoring Well Development form.

GEOLOGIC LOG OF DRILL HOLE NO. MW-09-125

FEATURE: Groundwater Monitoring
 LOCATION: Reach 5, River Bank Right, Merced County
 BEGUN: 11/19/09 FINISHED: 11/20/09
 DEPTH AND ELEVATION OF WATER LEVEL
 AND DATE MEASURED: 10.1 ft. (El. 63.99 ft.) 11/20/2009

PROJECT: San Joaquin River Restoration Project
 COORDINATES: N 2,367,038.9 E 6,004,739.0 (NAGD83)
 TOTAL DEPTH: 49.5 ft.

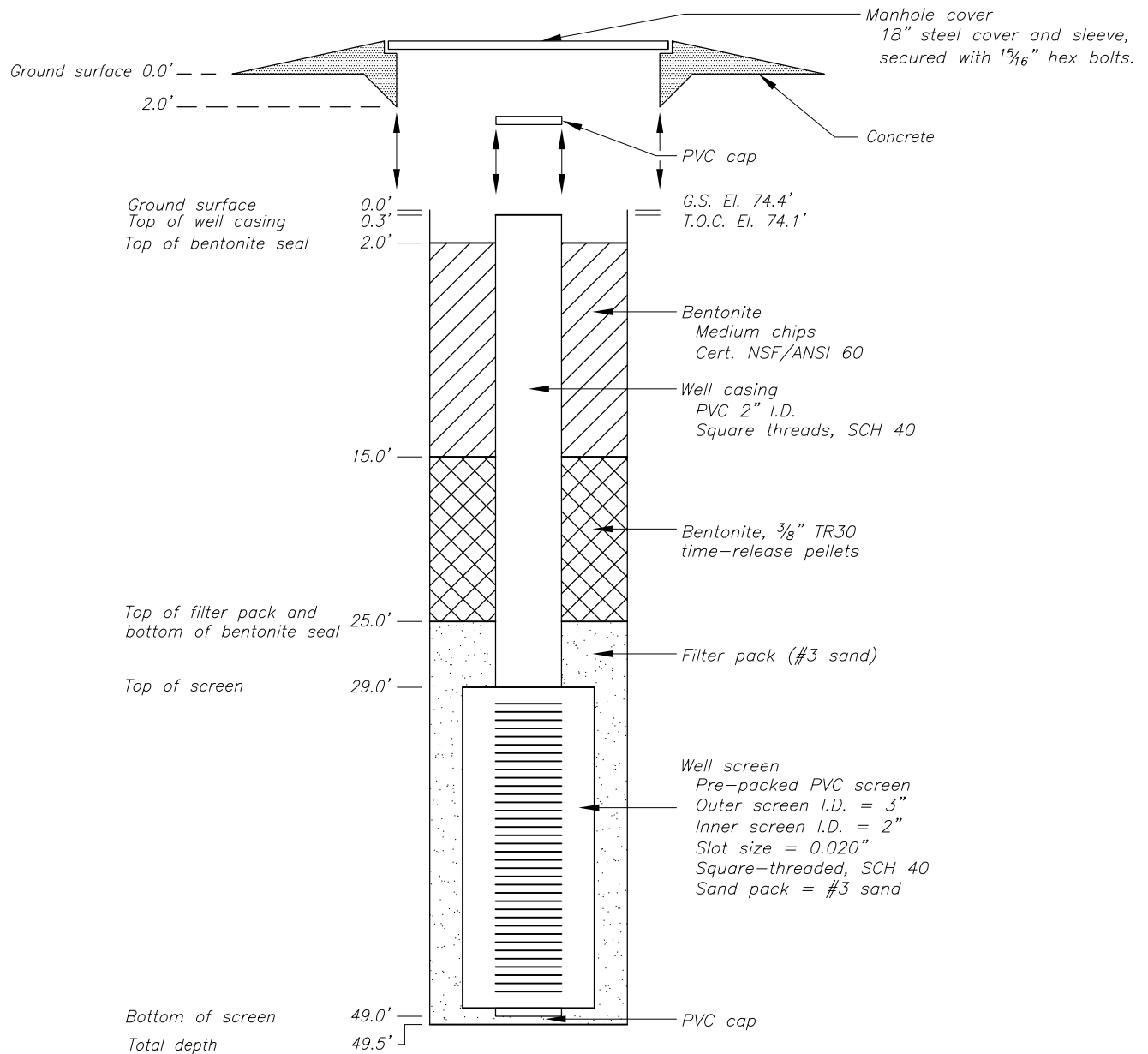
STATE: California
 GROUND SURFACE ELEVATION: 74.4 ft. (NAVD88)
 T.O.C ELEVATION: 74.09 ft. (NAVD88)
 HOLE LOGGED BY: J. Vauk
 REVIEWED BY: A. Warren

| NOTES | DEPTH | LABORATORY DATA | | | | | | | | | LABORATORY CLASSIFICATION | ELEVATION | VISUAL CLASSIFICATION | ELEVATION | GEOLOGIC UNIT SYMBOL | CLASSIFICATION AND PHYSICAL CONDITION |
|-------|-------|-----------------|--------|--------|---------|--------|----------|--------------|------------------|--------------------|---------------------------|-----------|-----------------------|-----------|----------------------|---|
| | | % CORE RECOVERY | % SILT | % CLAY | % FINES | % SAND | % GRAVEL | LIQUID LIMIT | PLASTICITY INDEX | MOISTURE CONTENT % | | | | | | |
| | 0 | | | | | | | | | | | | SM | | | <p>25.7 to 26.1 ft.: SILT WITH SAND, (ML)s: About 75% non-plastic fines with rapid dilatancy; about 25% fine sand; maximum size: fine sand; wet, gray, no reaction with HCl; soft consistency.</p> <p>26.1 to 28.8 ft.: POORLY GRADED SAND, SP: About 95% fine to medium sand; about 5% non-plastic fines with rapid dilatancy; maximum size: medium sand; core loss.</p> <p align="center"><u>Laboratory Data Interval</u> 26.1 to 28.8 ft.</p> <p>28.8 to 29.1 ft.: SILTY CLAY, CL/ML: About 90% fines with medium plasticity, low toughness and dry strength, and no dilatancy; about 10% fine sand; maximum size: fine sand; moist, gray, no reaction with HCl; soft consistency.</p> <p>29.1 to 29.5 ft.: SANDY SILT, s(ML): About 50% non-plastic fines with rapid dilatancy; about 50% fine sand; maximum size: fine sand; wet, gray, no reaction with HCl; soft consistency.</p> <p>29.5 to 34.5 ft.: No Recovery - SILTY SAND, SM: Description is based on drilling conditions and an adjacent CPT (CPT-09-125).</p> <p>34.5 to 39.5 ft.: POORLY GRADED SAND WITH SILT, SP/SM: About 90% fine sand; about 10% non-plastic fines with rapid dilatancy; maximum size: fine sand; wet, gray, no reaction with HCl; soft consistency.</p> <p align="center"><u>Laboratory Data Interval</u> 34.5 to 39.5 ft.</p> <p>39.5 to 49.5 ft.: No Recovery - SILTY SAND, SM: Description is based on drilling conditions and an adjacent CPT (CPT-09-125).</p> <p align="right"><i>T.D. = 49.5 ft.</i></p> |
| | 35 | | 8.1 | 1.3 | 9.4 | 90.6 | 0.0 | NP | NP | 25.2 | | 39.6 | SP-SM | | | |
| | 68 | | | | | | | | | | | 36.6 | SP/SM | | | |
| | 40 | | | | | | | | | | | 34.6 | | | | |
| | 0 | | | | | | | | | | | | | | | |
| | 45 | | | | | | | | | | | | SM | | | |
| | 0 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | 24.6 |
| | | | | | | | | | | | | | | | | BOTTOM OF HOLE |

COMMENTS: FADC = Flight Auger Dry Core
 HSA = Hollow Stem Auger
 NP = Non-plastic
 NR = No Recovery
 NA = Not applicable
 G.S. = Ground surface
 b.g.s. = Below the ground surface
 T.O.C. = Top of well casing

Well completion information is provided in attached Well Completion Diagram. Well development information is provided in attached Monitoring Well Development form.

| | |
|--|---------------------|
| MW-09-125 | GEOLOGIST: J. VAUK |
| WELL COMPLETION DIAGRAM | DRILLER: K. COY |
| DATE COMPLETED: 11/20/2009 | HELPER: E. GONZALES |
| TOP OF WELL CASING COORDINATES: N2367038.9 E6004739.0 (NAD83) ELEVATION 74.1' (NAVD88) GROUND SURFACE ELEVATION 74.4' (NAVD88) | |



*NOT TO SCALE

NOTES:

T.O.C. = Top of well casing, I.D. = Inner Diameter, G.S. = Ground Surface, El. = Elevation

Sand backfills the well above the top of bentonite seal, inside the manhole.