

STORMWATER MANAGEMENT PLAN

For

WIDEFIELD WATER AND
SANITATION DISTRICT

VA PPNC
WATER DELIVERY SYSTEM



December 2017

Prepared By:

JDS-HYDRO

CONSULTANTS, INC.

STORMWATER MANAGEMENT PLAN
Widefield Water and Sanitation District
VA PPNC Water Delivery System

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CONTACT INFORMATION

Applicant/Owner Information

Name: Widefield Water and Sanitation District
Address: 8495 Fontaine Blvd., Colorado Springs, CO 80925
Contact: Brandon Bernard, Water Manager
Telephone: 719-464-2051
Fax: 719-392-4328

Prepared by

Name: JDS-Hydro Consultants, Inc.
Address: 545 E. Pikes Peak Ave., Ste. 300, Colorado Springs, CO 80903
Contact: Gwen Dall, P.E.
Telephone: 719-227-0072 ext. 109
Email: gdall@jdshydro.com

Designated Operator

Name: Widefield Water and Sanitation District
Address: 8495 Fontaine Blvd., Colorado Springs, CO 80925
Contact: Brandon Bernard, Water Manager
Telephone: 719-464-2051

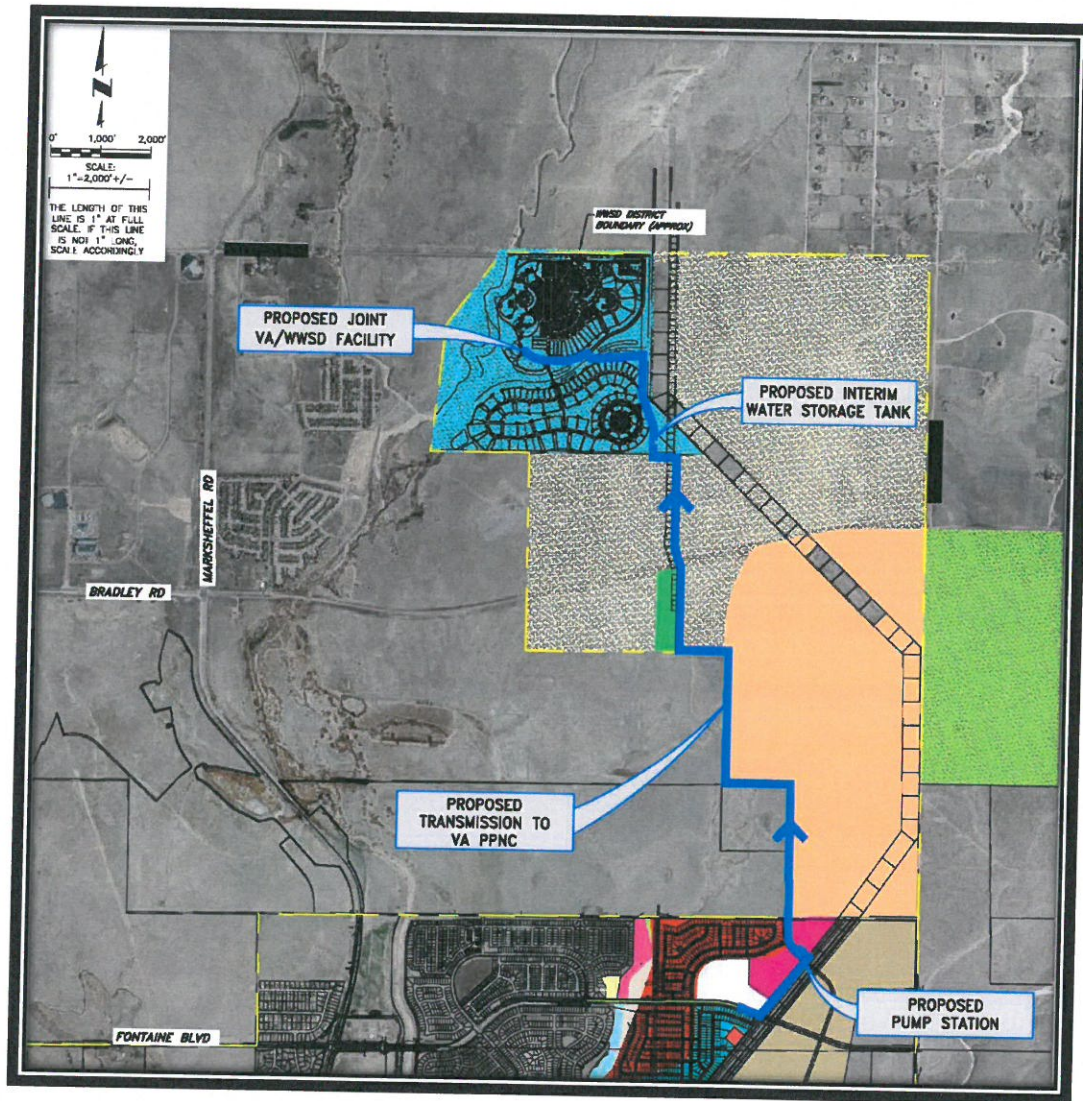
Contractor

Name: TBD
Address: TBD
Contact: TBD
Telephone: TBD

1.0 SITE DESCRIPTION

A. SITE LOCATION

The pipeline begins approximately 4500 feet east of the intersection of Fontaine Boulevard and Stingray Lane in Colorado Springs, CO and extends north to the VA Pikes Peak National Cemetery (PPNC). A buried tank will be located on the VA site and a buried booster pump station will be installed in Lorson East on the property described in El Paso County Schedule 5500000403 and located along the future Lorson Boulevard. The location of the construction office is not yet known. The vicinity map below shows the site location:



B. DESCRIPTION OF CONSTRUCTION

Pipeline construction consists of installing a potable water main in an excavated trench traversing across private property, federal property and one county roadway. The trench cuts are expected to be no deeper than 15 feet and generally 5 to 7 feet. Disturbed areas are generally grazing lands and all disturbed areas will be re-vegetated. Tank installation is on federal property and consists of excavating a pit sufficient to bury and properly bed a cylindrical tank measuring approximately 52 feet long and 10 foot in diameter and installing associated overflow and drain lines. Pitless booster station installation is on private property and

consists of excavating a pit sufficient to bury and properly bed two pitless unit measuring approximately 20 feet long by 16 inches in diameter, a bypass vault approximately 9 feet deep, 9 feet wide x 13 feet long, site grading, and field piping installation. Staging areas for construction is unknown at this time.

C. STEPS FOR CONSTRUCTION

- Construction Staking
- Underground pipeline installation
- Excavation and installation of buried tank
- Excavation and installation of buried pitless booster station
- Backfill and grading
- Final grading and revegetation

D. ESTIMATES OF EXCAVATION

The total acreage of disturbed land for the proposed pipeline, tank and booster station is approximately 32.5 acres. All disturbance and grading will take place within temporary and permanent easement boundaries. Grading to the indicated proposed grade will only take place on the VA EQ/Surge Tank site and the Rolling Hills Booster Pump Station site. The pipeline route will not be graded to the “proposed” grade indicated on the drawings. This proposed grade is only included to allow the designer and contractor to ensure the depth of cover for the pipeline accounts for future grading if and when the areas are developed.

Rolling Hills Booster Pump Station:

Cut: 84 cu. yds.

Fill: 89 (*1.15 for fluff) = 102 cu. yds.

Net Fill: 5 cu. yds.

VA EQ/Surge Tank:

Cut: 15 cu. yds.

Fill: 111 (*1.15 for fluff) = 128 cu. yds.

Net Fill: 113 cu. yds.

E. SOILS DESCRIPTION

Subsurface conditions at the project site consisted of slightly sandy to very sandy clay and/or slightly silty to silty sand, 3 to over 25 feet thick, underlain by claystone bed-rock. Shallow, medium hard to very hard bedrock was encountered at depths of five feet or less below the existing grade. *Appendix B* contains a geotechnical Soils Report for the project area.

F. VEGETATION

The existing vegetation is predominately native grasslands. Vegetation covering the site consists of prairie grasses and weeds. Approximate percent of cover is 50%.

G. DRAINAGE CHARACTERISTICS / RECEIVING WATERS

No springs, streams, wetlands, or other surface water or within the project boundaries. The closest surface waters are Jimmy Camp Creek and Williams Ditch. See drawing C1 for an overall map of the project indicating the floodplain and surface water locations.

H. POLLUTANTS

During construction, the largest possible source of non-storm water pollution would be leakage of oils and other fluids from construction equipment and vehicles. Refueling of equipment will occur at the staging area. The contractor shall be responsible for any spill cleanup from construction equipment, in accordance with applicable local, county, and state regulations. The contractor will also be responsible for cleanup of

any off-site vehicle tracking on paved roads. No other sources of pollution such as vehicle washing, chemical storage or waste disposal are anticipated.

I. DISCHARGE

No groundwater was encountered during soils testing for the geotechnical report so there are no anticipated non-storm water components of the discharge.

2.0 SITE MAP

The design drawings contain site maps for this project and should be used in conjunction with this report. There will be no anticipated storage of soils or wastes, nor will there be any asphalt or concrete batch plants located on the site. Location of erosion control facilities are shown on the plans. *See Appendix A.*

3.0 BEST MANAGEMENT PRACTICES

A. EROSION AND SEDIMENT CONTROLS

All erosion and sediment control will be installed immediately before any excavation. Straw bale check dams, erosion control socks and earthen berms will be placed at areas shown on the construction drawings.

Non-structure practices to control erosion and sedimentation will incorporate reseeding of ground cover in disturbed areas in accordance with the project specifications as soon as possible or at least during the same season. Additional methods will include brooms and shovels to relocate small amounts of soil erosion.

B. MATERIAL HANDLING AND SPILL PREVENTION

The most probable sources of non-storm water pollution are daily maintenance operations. If mobile fuel trucks are used to service equipment, absorbent materials and containers for the storage of used absorbent material will be nearby. Place debris, overburden, soil stockpiles and waste materials away from areas of runoff.

C. FINAL STABILIZATION AND LONG-TERM STORM WATER MANAGEMENT

Soil erosion control measures for all slopes, channels, ditches, or any disturbed land area shall be completed within twenty-one (21) calendar days after final grading, or final earth disturbance, has been completed. Disturbed areas and stockpiles which are not at final grade, but will remain dormant for longer than 30 days, shall also be mulched within 21 days after interim grading. An area that is going to remain in an interim state for more than 60 days shall also be seeded. All temporary soil erosion control measures and BMPs shall be maintained until permanent soil erosion control measures are implemented.

Vegetative cover density shall be a minimum of 70% of pre-disturbed levels to be considered stabilized.

D. OTHER CONTROLS

There are several Best Management Practices than can be employed to prevent or mitigate the source of pollutants and contamination of storm water runoff. Some of these are:

- All refuse dumpsters and receptacles shall be equipped with functional lids to prevent rain and snow from entering. Lids must be closed when dumpsters and receptacles are not actively in use.
- Storage containers, drums, and bags shall be stored away from direct traffic routes to prevent accidental spills. Ensure packages and containers are intact.
- Empty drums shall be covered to prevent collection of precipitation.

- Containers shall be stored on pallets to prevent corrosion of containers, which can result when containers come in contact with moisture on the ground.
- Regularly scheduled removal of construction trash and debris.
- Tracking control must be implemented by the contractor to prevent unnecessary soil from entering paved surfaces. The measures to be used will be preventing equipment in the construction area from moving off-site. If the contractor cannot do this, then a vehicle tracking pad will be required according to El Paso County specifications. Brooms and shovels may be required for tracking control.

The contractor is certainly not limited to these measures which may require adjusting the BMP's as the project progresses and implement further controls as prudence and good judgment deem necessary.

E. INSPECTION AND MAINTENANCE

A thorough inspection of the storm water management system shall be performed every 14 days as well as after any rain or snowmelt event that causes surface erosion.

- Erosion of side slopes shall be repaired.
- Silt fences shall be cleaned whenever sediment has reached a depth of six (6) inches at the fence, and broken wooden parts or torn fabric shall be repaired or replaced.
- Any accumulated trash or debris shall be removed from these protected areas.
- In the case where additional BMP's are required in areas later determined as a risk but not included in the drawings, contractor will be required to install BMP's at these locations. These areas may include: excavated dirt piles, protection of existing drainage systems, and roadway drainage.

An Inspection and Maintenance Log is attached to this Storm Water Management Plan.

A copy of this SWMP is to be located at all times with the Foreman/Superintendent responsible for maintaining conditions set forth in this document.

This SWMP shall be revised by informing Engineer of deviations to original plan. Engineer will then update this report and all applicable drawings, forms, tables, etc... as deemed necessary.

4.0 INSPECTION AND MAINTENANCE LOG

**WIDEFIELD WATER AND SANITATION DISTRICT
VA PPNC WATER DELIVERY SYSTEM
STORM WATER MANAGEMENT PLAN
INSPECTION AND MAINTENANCE LOG**

(Record inspections, items found, maintenance, and corrective actions taken. Also record any training received by Contractor personnel with regard to erosion control, materials handling, and any inspections by outside agencies.)

| DATE | ITEM | SIGNATURE OF PERSON MAKING ENTRY |
|------|------|-------------------------------------|
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Appendix A

ESQCP Application and Permit

**EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP)
EL PASO COUNTY
APPLICATION AND PERMIT**

PERMIT NUMBER _____

APPLICANT INFORMATION

| Applicant Contact Information | |
|--|---|
| Owner | Widefield Water and Sanitation District |
| Name (person of responsibility) | Brandon Bernard |
| Company/Agency | Widefield Water and Sanitation District |
| Position of Applicant | Water Department Manager |
| Address (physical address, not PO Box) | 8495 Fontaine Blvd. |
| City | Colorado Springs |
| State | Colorado |
| Zip Code | 80925 |
| Mailing address, if different from above | |
| Telephone | 719-390-7111 |
| FAX number | 719-390-1409 |
| Email Address | brandon@wwsdonline.com |
| Cellular Phone number | 719-464-2051 |

CONTRACTOR INFORMATION

| Contractor | |
|--|--|
| Name (person of responsibility) | |
| Company | |
| Address (physical address, not PO Box) | |
| City | |
| State | |
| Zip Code | |
| Mailing address, if different from above | |
| Telephone | |
| FAX number | |
| Email Address | |
| Cellular Phone number | |
| Erosion Control Supervisor (ECS)* | |
| ECS Phone number* | |
| ECS Cellular Phone number* | |

*Required for all applicants. May be provided at later date pending securing a contract when applicable.

PROJECT INFORMATION

| Project Specifications | |
|--|---|
| Project Name | VA PPNC Water Delivery System |
| Legal Description | See attached legal descriptions. |
| Address (or nearest major cross streets) | Project begins approximately 4500' east of the intersection of Fontaine Blvd and Stingray Ln and extends north to the proposed VA PPNC at 10545 Drennan Rd. |
| Acreage (total and disturbed) | Total: 32.5 acres Disturbed: acres |
| Schedule | Start of Construction: January 2018 Completion of Construction: June 2018 Final Stabilization: June 2019 |
| Project Purpose | Provide drinking and irrigation water to the proposed VA Pikes Peak National Cemetery |
| Description of Project | Project includes approximately 20,000 LF of pipe, a buried booster pump station, and a buried water tank. |
| Tax Schedule Numbers | 5513301001, 5500000403, 5500000324, 5500000383, 384 and 385 |

FOR OFFICE USE ONLY

The following signature from the ECM Administrator signifies the approval of this ESQCP. All work shall be performed in accordance with the permit, the El Paso County Engineering Criteria Manual (ECM) Standards, City of Colorado Springs Drainage Criteria Manual, Volume 2 (DCM2) as adopted by El Paso County Addendum, approved plans, and any attached conditions. The approved plans are an enforceable part of the ESQCP. Construction activity, except for the installation of initial construction BMPs is not permitted until issuance of a Construction permit and Notice to Proceed.

Signature of ECM Administrator: _____ Date _____

1.1 REQUIRED SUBMISSIONS

In addition to this completed and signed application, the following items must be submitted to obtain an ESQCP:

- Permit fees
- Stormwater Management Plan (SWMP) meeting the requirements of DCM2 and ECM either as part of the plan set or as a separate document;
- Cost estimates of construction and maintenance of construction and permanent stormwater control measures (Cost estimates shall be provided on a unit cost basis for all stormwater BMPs);
- Financial surety in an amount agreeable to the ECM Administrator based on the cost estimates of the stormwater quality protection measures provided. The financial surety shall be provided in the form of a Letter of Credit, Surety with a Bonding Company, or other forms acceptable to El Paso County;
- Operation and Maintenance Plan for any proposed permanent BMPs; and
- Signed Private Detention Basin/Stormwater Quality Best Management Practice Maintenance Agreement and Easement, if any permanent Best Management Practices are to be located on site.

1.2 RESPONSIBILITY FOR DAMAGE

The County and its officers and employees, including but not limited to the ECM Administrator, shall not be answerable or accountable in any manner, for injury to or death of any person, including but not limited to a permit holder, persons employed by the permit holder, persons acting in behalf of the permit holder, or for damage to property resulting from any activities undertaken by a permit holder or under the direction of a permit holder. The permit holder shall be responsible for any liability imposed by law and for injuries to or death of any person, including but not limited to the permit holder, persons employed by the permit holder, persons acting in behalf of the permit holder, or damage to property arising out of work or other activity permitted and done by the permit holder under a permit, or arising out of the failure on the permit holder's part to perform the obligations under any permit in respect to maintenance or any other obligations, or resulting from defects or obstructions, or from any cause whatsoever during the progress of the work, or other activity, or at any subsequent time work or other activity is being performed under the obligations provided by and contemplated by the permit.

To the extent allowed by law, the permit holder shall indemnify, save, and hold harmless the County and its officers and employees, including but not limited to the BOCC and ECM Administrator, from all claims, suits or actions of every name, kind and description brought for or on account of injuries to or death of any person, including but not limited to the permit holder, persons employed by the permit holder, persons acting in behalf of the permit holder and the public, or damage to property resulting from the performance of work or other activity under the permit, or arising out of the failure on the permit holder's part to perform his obligations under any permit in respect to maintenance or any other obligations, or resulting from defects or obstructions, or from any cause whatsoever during the progress of the work, or other activity or at any subsequent time work or other activity is being performed under the obligations provided by and contemplated by the permit, except as otherwise provided by state law. The permit holder waives any and all rights to any type of expressed or implied indemnity against the County, its officers or employees.

1.3 APPLICATION CERTIFICATION

I, as the Applicant or the representative of the Applicant, hereby certify that this application is correct and complete as per the requirements presented in this application and the El Paso County Engineering Criteria Manual and Drainage Criteria Manual, Volume 2 and El Paso County Addendum.

I, as the Applicant or the representative of the Applicant, have read and will comply with all of the requirements of the specified Stormwater Management Plan and any other documents specifying stormwater best management practices to be used on the site including permit conditions that may be required by the ECM Administrator. I understand that the Best Management Practices are to be maintained on the site and revised as necessary to protect stormwater quality as the project progresses. I further understand that a Construction Permit must be obtained and all necessary stormwater quality control BMPs are to be installed in accordance with the SWMP and the El Paso County Engineering Criteria Manual and Drainage Criteria Manual, Volume 2 and El Paso County Addendum before land disturbance begins and that failure to comply will result in a Stop Work Order and may result in other penalties as allowed by law. I further understand and agree to indemnify, save, and hold harmless the County and its officers and employees, including but not limited to the BOCC and ECM Administrator, from all claims, suits or actions of every name, kind and description as outlined in Section 1.2 Responsibility for Damage.

Signature of Applicant or Representative

Date: _____

Print Name of Applicant or Representative

Permit Fee \$ _____

Surcharge \$ _____

Financial Surety \$ _____

Type of Surety _____

Total \$ _____

EXHIBIT A

October 20, 2017
REVISED: November 30, 2017

A portion of that parcel of land recorded at Reception No. 215091608 in the records of El Paso County, State of Colorado, located within the Section 12 and the Northeast Quarter of Section 13, Township 15 South, Range 65 West of the 6th Principal Meridian, being more particularly described as follows:

Parcel 1: Permanent Easement

BEGINNING at the East Center corner of said Section 12; thence along the West line of said parcel N00°06'53"W (Bearings are based on Colorado State Plane Coordinate System, Central Zone, North American Datum 1983. The bearing of the South line of the Southeast Quarter of the Northwest Quarter, marked at the West end by a 3" Axle and at the East end by a 3/4" Aluminum Cap "LS 16109 2004", bears N88°24'38"E, having a measured distance of 1,325.73 feet), a distance of 30.00 feet to a point hereinafter known as **POINT "A"**; thence leaving said West line along the following four (4) courses:

1. N89°17'27"E, a distance of 44.97 feet
2. S00°10'45"E, a distance of 2,693.25 feet
3. N89°28'30"E, a distance of 1,307.51 feet
4. S00°21'23"E, a distance of 2,661.94 feet, more or less,

to a point on the South line of said parcel, said point also being a point on the East-West centerline of said Section 13; thence along said South line, S89°25'36"W, a distance of 30.00 feet to the most Southwest corner of said parcel, also being the Center Quarter corner of said Section 13; thence leaving said South line and along the West line of said parcel, also being the North-South centerline of said Section 13, N00°21'23"W, a distance of 2,636.96 feet, more or less, to the North Quarter corner of said Section 13; thence leaving said West line and along the North line of the Northwest Quarter of said Section 13, S89°28'30"W, a distance of 1,322.60 feet, more or less, to the East 1/16 corner of said Section 12 and said Section 13; thence leaving said North line and along the East line of the West half of said Section 12, N00°10'45"W, a distance of 2,643.13 feet, more or less, to the **POINT OF BEGINNING**.

Said parcel contains 232,060 S.F. or 5.327 acres, more or less.

Parcel 2: Temporary Easement

BEGINNING at the aforementioned **POINT "A"**; thence along the West line of said parcel, N00°06'53"W, a distance of 35.00 feet; thence leaving said West line along the following four (4) courses:

1. N89°17'27"E, a distance of 69.93 feet
2. S00°10'45"E, a distance of 2,713.29 feet
3. N89°28'30"E, a distance of 1,317.38 feet
4. S00°21'23"E, a distance of 2,701.91 feet, more or less,

to a point on the South line of said parcel, said point also being a point on the East-West centerline of said Section 13; thence along said South line, S89°25'36"W, a distance of 35.00 feet; thence leaving said South line along the following four (4) courses:

1. N00°21'23"W, a distance of 2,666.94 feet
2. S89°28'30"W, a distance of 1,307.50 feet
3. N00°10'45"W, a distance of 2,643.28 feet
4. S89°17'27"W, a distance of 44.97 feet

to the **POINT OF BEGINNING**.

Said parcel contains 214,537 S.F. or 4.925 acres, more or less.

Stewart L. Mapes, Jr.
Colorado Professional Land Surveyor No. 38245
For and on behalf of Clark Land Surveying, Inc.





20 Boulder Crescent, STE 110
Colorado Springs, CO 80903
Mail to: PO Box 1360
Colorado Springs, CO 80901
719.955.5485

**PERMANENT EASEMENT AGREEMENT
FUTURE LORSON BOULEVARD
WATERMAIN EASEMENT**

A PARCEL OF LAND IN THE SOUTH HALF (S 1/2) OF SECTION 13, TOWNSHIP 15 SOUTH, RANGE 65 WEST, OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS: THE EAST LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 15 SOUTH, RANGE 65 WEST OF THE 6TH P.M. EL PASO COUNTY, COLORADO. THE SOUTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BEING MONUMENTED WITH A 3-1/4" ALUMINUM CAP STAMPED "LS 16109", FROM WHICH THE NORTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BEING MONUMENTED WITH A 3-1/4" ALUMINUM CAP STAMPED "LS 23044", BEARS N00°22'02" W, A DISTANCE OF 2,627.10 FEET.

BEGINNING AT THE NORTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4), SECTION 13;
THENCE N89°26'06"E, A DISTANCE OF 32.00 FEET;
THENCE S00°57'56"E, A DISTANCE OF 267.05 FEET TO A POINT OF CURVE;
THENCE SOUTHEASTERLY ALONG THE ARC OF A CURVE TO THE LEFT, SAID CURVE HAVING A RADIUS OF 533.00 FEET, A CENTRAL ANGLE OF 51°09'19", (THE CHORD OF WHICH BEARS S26°32'35"E, 460.23 FEET) AN ARC DISTANCE OF 475.88 FEET TO A POINT OF TANGENT;
THENCE S52°07'15"E, ALONG SAID TANGENT, 254.48 FEET TO THE NORTHWESTERLY LINE OF THAT CERTAIN 100 FOOT WIDE EASEMENT DESCRIBED IN BOOK 2665 AT PAGE 715 IN THE RECORDS OF EL PASO COUNTY, COLORADO;
THENCE S38°16'47"W, ALONG THE NORTHWESTERLY LINE THEREOF, 64.00 FEET;
THENCE N52°07'15"W, A DISTANCE OF 254.04 FEET TO A POINT OF CURVE;
THENCE NORTHWESTERLY ALONG THE ARC OF A CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 597.00 FEET, A CENTRAL ANGLE OF 51°09'19", (THE CHORD OF WHICH BEARS N26°32'35"W, 515.49 FEET) AN ARC DISTANCE OF 533.02 FEET TO A POINT OF TANGENT;
THENCE N00°57'56"W, ALONG SAID TANGENT, 267.50 FEET;
THENCE N89°26'06"E, A DISTANCE OF 32.00 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS A CALCULATED AREA OF 65,662 S.F. (1.507 ACRES MORE OR LESS).

PREPARED BY:

Vernon P Taylor

10/27/17

VERNON P. TAYLOR, COLORADO P.L.S. NO. 25966
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903

DATE





20 Boulder Crescent, STE 110
Colorado Springs, CO 80903
Mail to: PO Box 1360
Colorado Springs, CO 80901
719.955.5485

**FUTURE LORSON BOULEVARD
TEMPORARY CONSTRUCTION EASEMENT**

A PARCEL OF LAND IN THE SOUTH HALF (S 1/2) OF SECTION 13, TOWNSHIP 15 SOUTH, RANGE 65 WEST, OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS: THE EAST LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 15 SOUTH, RANGE 65 WEST OF THE 6TH P.M. EL PASO COUNTY, COLORADO. THE SOUTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BEING MONUMENTED WITH A 3-1/4" ALUMINUM CAP STAMPED "LS 16109", FROM WHICH THE NORTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BEING MONUMENTED WITH A 3-1/4" ALUMINUM CAP STAMPED "LS 23044", BEARS N00°22'02" W, A DISTANCE OF 2,627.10 FEET.

COMMENCING AT THE NORTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4), SECTION 13; THENCE N89°26'06"E, A DISTANCE OF 32.00 FEET TO THE TRUE POINT OF BEGINNING OF THIS LEGAL DESCRIPTION;
THENCE CONTINUE N89°26'06"E, A DISTANCE OF 20.00 FEET;
THENCE S00°57'56"E, A DISTANCE OF 266.91 FEET TO A POINT OF CURVE;
THENCE SOUTHEASTERLY ALONG THE ARC OF A CURVE TO THE LEFT, SAID CURVE HAVING A RADIUS OF 513.00 FEET, A CENTRAL ANGLE OF 49°26'13", (THE CHORD OF WHICH BEARS S25°41'02"E, 429.03 FEET) AN ARC DISTANCE OF 442.64 FEET;
THENCE N38°16'47"E, NON-TANGENT TO THE PREVIOUS COURSE, 169.77 FEET;
THENCE S52°07'15"E, A DISTANCE OF 270.01 FEET TO THE NORTHWESTERLY LINE OF THAT CERTAIN 100 FOOT WIDE EASEMENT DESCRIBED IN BOOK 2665 AT PAGE 715 IN THE RECORDS OF EL PASO COUNTY, COLORADO;
THENCE S38°16'47"W, ALONG THE NORTHWESTERLY LINE THEREOF, 50.00 FEET;
THENCE N52°07'15"W, A DISTANCE OF 220.01 FEET;
THENCE S38°16'47"W, A DISTANCE OF 140.00 FEET;
THENCE N52°07'15"W, A DISTANCE OF 34.48 FEET TO A POINT OF CURVE;
THENCE NORTHWESTERLY ALONG THE ARC OF A CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 533.00 FEET, A CENTRAL ANGLE OF 51°09'19", (THE CHORD OF WHICH BEARS N26°32'35"W, 460.23 FEET) AN ARC DISTANCE OF 475.88 FEET TO A POINT OF TANGENT;
THENCE N00°57'56"W, ALONG SAID TANGENT, 267.05 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS A CALCULATED AREA OF 34,869 S.F. (0.800 ACRES MORE OR LESS).

PREPARED BY:

Vernon P Taylor

10/27/17

VERNON P. TAYLOR, COLORADO P.L.S. NO. 25966
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903

DATE





20 Boulder Crescent, STE 110
Colorado Springs, CO 80903
Mail to: PO Box 1360
Colorado Springs, CO 80901
719.955.5485

**LORSON PROPERTY
TEMPORARY CONSTRUCTION EASEMENT**

A PARCEL OF LAND IN THE SOUTH HALF (S 1/2) OF SECTION 13, TOWNSHIP 15 SOUTH, RANGE 65 WEST, OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS: THE EAST LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 15 SOUTH, RANGE 65 WEST OF THE 6TH P.M. EL PASO COUNTY, COLORADO. THE SOUTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BEING MONUMENTED WITH A 3-1/4" ALUMINUM CAP STAMPED "LS 16109", FROM WHICH THE NORTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BEING MONUMENTED WITH A 3-1/4" ALUMINUM CAP STAMPED "LS 23044", BEARS N00°22'02" W, A DISTANCE OF 2,627.10 FEET.

COMMENCING AT THE SOUTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4), THENCE N12°34'05"W, A DISTANCE OF 1000.63 FEET TO THE NORTHEAST CORNER OF TRACT J, "PIONEER LANDING AT LORSON RANCH FILING NO. 2" AS RECORDED UNDER RECEPTION NO. 217713888 IN THE RECORDS OF EL PASO COUNTY, COLORADO;
THENCE N58°30'04"W, ALONG THE NORTHERLY LINE OF TRACT J, 40.28 FEET TO THE POINT OF BEGINNING.

THENCE CONTINUE N58°30'04"W, ALONG THE NORTHERLY LINE OF TRACT J, 50.35 FEET;
THENCE N38°16'47"E, A DISTANCE OF 985.57 FEET;
THENCE S52°07'15"E, A DISTANCE OF 50.00 FEET;
THENCE S38°16'47"W, A DISTANCE OF 979.97 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS A CALCULATED AREA OF 49,139 S.F. (1.128 ACRES MORE OR LESS).

PREPARED BY:

10/27/17

VERNON P. TAYLOR, COLORADO P.L.S. NO. 25966
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903

DATE





CIVIL CONSULTANTS, INC.

20 Boulder Crescent, STE 110
Colorado Springs, CO 80903
Mail to: PO Box 1360
Colorado Springs, CO 80901
719.955.5485

**PERMANENT EASEMENT AGREEMENT
LORSON PROPERTY
WATERMAIN EASEMENT**

A PARCEL OF LAND IN THE SOUTH HALF (S 1/2) OF SECTION 13, TOWNSHIP 15 SOUTH, RANGE 65 WEST, OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS: THE EAST LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 15 SOUTH, RANGE 65 WEST OF THE 6TH P.M. EL PASO COUNTY, COLORADO. THE SOUTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BEING MONUMENTED WITH A 3-1/4" ALUMINUM CAP STAMPED "LS 16109", FROM WHICH THE NORTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BEING MONUMENTED WITH A 3-1/4" ALUMINUM CAP STAMPED "LS 23044", BEARS N00°22'02" W, A DISTANCE OF 2,627.10 FEET.

COMMENCING AT THE SOUTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4), THENCE N12°34'05"W, A DISTANCE OF 1000.63 FEET TO THE NORTHEAST CORNER OF TRACT J, "PIONEER LANDING AT LORSON RANCH FILING NO. 2" AS RECORDED UNDER RECEPTION NO. 217713888 IN THE RECORDS OF EL PASO COUNTY, COLORADO;
THENCE N58°30'04"W, ALONG THE NORTHERLY LINE OF TRACT J, 10.07 FEET TO THE POINT OF BEGINNING.

THENCE CONTINUE N58°30'04"W, ALONG THE NORTHERLY LINE OF TRACT J, 30.21 FEET;
THENCE N38°16'47"E, A DISTANCE OF 979.97 FEET;
THENCE S52°07'15"E, A DISTANCE OF 30.00 FEET;
THENCE S38°16'47"W, A DISTANCE OF 976.62 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS A CALCULATED AREA OF 29,349 S.F. (0.674 ACRES MORE OR LESS).

PREPARED BY:

Vernon P Taylor

10/27/17

VERNON P. TAYLOR, COLORADO P.L.S. NO. 25966 DATE
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903





20 Boulder Crescent, STE 110
Colorado Springs, CO 80903
Mail to: PO Box 1360
Colorado Springs, CO 80901
719.955.5485

**PERMANENT EASEMENT AGREEMENT
PROPOSED PUMP HOUSE**

A PARCEL OF LAND IN THE SOUTH HALF (S 1/2) OF SECTION 13, TOWNSHIP 15 SOUTH, RANGE 65 WEST, OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS: THE EAST LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 15 SOUTH, RANGE 65 WEST OF THE 6TH P.M. EL PASO COUNTY, COLORADO. THE SOUTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BEING MONUMENTED WITH A 3-1/4" ALUMINUM CAP STAMPED "LS 16109", FROM WHICH THE NORTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BEING MONUMENTED WITH A 3-1/4" ALUMINUM CAP STAMPED "LS 23044", BEARS N00°22'02" W, A DISTANCE OF 2,627.10 FEET.

COMMENCING AT THE NORTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4), SECTION 13; THENCE S21°04'11"E, A DISTANCE OF 749.41 FEET TO THE TRUE POINT OF BEGINNING OF THIS LEGAL DESCRIPTION;

THENCE N38°16'47"E, A DISTANCE OF 140.00 FEET;

THENCE S52°07'15"E, A DISTANCE OF 220.01 FEET TO THE NORTHWESTERLY LINE OF THAT CERTAIN 100 FOOT WIDE EASEMENT DESCRIBED IN BOOK 2665 AT PAGE 715 IN THE RECORDS OF EL PASO COUNTY, COLORADO;

THENCE S38°16'47"W, ALONG THE NORTHWESTERLY LINE THEREOF, 140.00 FEET;

THENCE N52°07'15"W, A DISTANCE OF 220.01 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS A CALCULATED AREA OF 30,800 S.F. (0.707 ACRES MORE OR LESS).

PREPARED BY:

Vernon P. Taylor

10/27/17

VERNON P. TAYLOR, COLORADO P.L.S. NO. 25966

DATE

FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC

20 BOULDER CRESCENT, SUITE 110

COLORADO SPRINGS, CO 80903





20 Boulder Crescent, STE 110
Colorado Springs, CO 80903
Mail to: PO Box 1360
Colorado Springs, CO 80901
719.955.5485

**TEMPORARY CONSTRUCTION EASEMENT
TRACT J "PIONEER LANDING AT LORSON RANCH FILING NO. 2"**

A PARCEL OF LAND IN THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 15 SOUTH, RANGE 65 WEST, OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO, BEING A PORTION OF TRACT J "PIONEER LANDING AT LORSON RANCH FILING NO. 2" AS RECORDED UNDER RECEPTION NO. 217713888 IN THE RECORDS OF EL PASO COUNTY, COLORADO AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS: THE EAST LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 15 SOUTH, RANGE 65 WEST OF THE 6TH P.M. EL PASO COUNTY, COLORADO. THE SOUTHEAST CORNER OF SAID SOUTHEAST QUARTER (SW1/4) BEING MONUMENTED WITH A 3-1/4" ALUMINUM CAP STAMPED "LS 16109", FROM WHICH THE NORTHEAST CORNER OF SAID SOUTHEAST QUARTER (SE1/4) BEING MONUMENTED WITH A 3-1/4" ALUMINUM CAP STAMPED "LS 23044", BEARS N00°22'02" W, A DISTANCE OF 2,627.10 FEET.

COMMENCING AT THE SOUTHEAST CORNER OF SAID SOUTHEAST QUARTER (SE1/4), THENCE N31°26'49"W, A DISTANCE OF 827.20 FEET TO THE SOUTHEAST CORNER OF SAID TRACT J;
THENCE N70°12'23"W, ALONG THE SOUTHERLY LINE THEROF, 42.18 FEET TO THE POINT OF BEGINNING.

THENCE CONTINUING N70°12'23"W, ALONG THE SOUTHERLY LINE OF TRACT J, 52.72 FEET;

THENCE N38°16'47"E, A DISTANCE OF 364.54 FEET TO THE NORTH LINE OF TRACT J;
THENCE S58°30'04"E, ALONG THE NORTHERLY LINE OF TRACT J, 50.35 FEET;
THENCE S38°16'47"W, A DISTANCE OF 353.77 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS A CALCULATED AREA OF 17,958 S.F. (0.412 ACRES MORE OR LESS).

PREPARED BY:

Vernon P Taylor 10/27/17
VERNON P. TAYLOR, COLORADO P.L.S. NO. 25966 DATE
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903





20 Boulder Crescent, STE 110
Colorado Springs, CO 80903
Mail to: PO Box 1360
Colorado Springs, CO 80901
719.955.5485

**PERMANENT EASEMENT AGREEMENT
TRACT J "PIONEER LANDING AT LORSON RANCH FILING NO. 2"
WATER EASEMENT**

A PARCEL OF LAND IN THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 15 SOUTH, RANGE 65 WEST, OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO, BEING A PORTION OF TRACT J "PIONEER LANDING AT LORSON RANCH FILING NO. 2" AS RECORDED UNDER RECEPTION NO. 217713888 IN THE RECORDS OF EL PASO COUNTY, COLORADO AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS: THE EAST LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 15 SOUTH, RANGE 65 WEST OF THE 6TH P.M. EL PASO COUNTY, COLORADO. THE SOUTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW1/4) BEING MONUMENTED WITH A 3-1/4" ALUMINUM CAP STAMPED "LS 16109", FROM WHICH THE NORTHEAST CORNER OF SAID SOUTHWEST QUARTER (SE1/4) BEING MONUMENTED WITH A 3-1/4" ALUMINUM CAP STAMPED "LS 23044", BEARS N00°22'02" W, A DISTANCE OF 2,627.10 FEET.

COMMENCING AT THE SOUTHEAST CORNER OF SAID SOUTHWEST QUARTER (SE1/4), THENCE N31°26'49"W, A DISTANCE OF 827.20 FEET TO THE SOUTHEAST CORNER OF SAID TRACT J; THENCE N70°12'23"W, ALONG THE SOUTHERLY LINE THEROF, 10.54 FEET TO THE POINT OF BEGINNING.

THENCE CONTINUING N70°12'23"W, ALONG THE SOUTHERLY LINE OF TRACT J, 31.63 FEET; THENCE N38°16'47"E, A DISTANCE OF 353.77 FEET TO THE NORTH LINE OF TRACT J; THENCE S58°30'04"E, ALONG THE NORTHERLY LINE OF TRACT J, 30.21 FEET; THENCE S38°16'47"W, A DISTANCE OF 347.31 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS A CALCULATED AREA OF 10,516 S.F. (0.241 ACRES MORE OR LESS).

PREPARED BY:

Vernon P Taylor 10/27/17
VERNON P. TAYLOR, COLORADO P.L.S. NO. 25966 DATE
FOR AND ON BEHALF OF M&S CIVIL CONSULTANTS, INC
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903



EXHIBIT A

October 20, 2017
REVISED: November 30, 2017

A portion of that parcel of land recorded at Reception No. 215091608 in the records of El Paso County, State of Colorado, located within the Section 12 and the Northeast Quarter of Section 13, Township 15 South, Range 65 West of the 6th Principal Meridian, being more particularly described as follows:

Parcel 1: Permanent Easement

BEGINNING at the East Center corner of said Section 12; thence along the West line of said parcel N00°06'53"W (Bearings are based on Colorado State Plane Coordinate System, Central Zone, North American Datum 1983. The bearing of the South line of the Southeast Quarter of the Northwest Quarter, marked at the West end by a 3" Axle and at the East end by a 3/4" Aluminum Cap "LS 16109 2004", bears N88°24'38"E, having a measured distance of 1,325.73 feet), a distance of 30.00 feet to a point hereinafter known as **POINT "A"**; thence leaving said West line along the following four (4) courses:

1. N89°17'27"E, a distance of 44.97 feet
2. S00°10'45"E, a distance of 2,693.25 feet
3. N89°28'30"E, a distance of 1,307.51 feet
4. S00°21'23"E, a distance of 2,661.94 feet, more or less,

to a point on the South line of said parcel, said point also being a point on the East-West centerline of said Section 13; thence along said South line, S89°25'36"W, a distance of 30.00 feet to the most Southwest corner of said parcel, also being the Center Quarter corner of said Section 13; thence leaving said South line and along the West line of said parcel, also being the North-South centerline of said Section 13, N00°21'23"W, a distance of 2,636.96 feet, more or less, to the North Quarter corner of said Section 13; thence leaving said West line and along the North line of the Northwest Quarter of said Section 13, S89°28'30"W, a distance of 1,322.60 feet, more or less, to the East 1/16 corner of said Section 12 and said Section 13; thence leaving said North line and along the East line of the West half of said Section 12, N00°10'45"W, a distance of 2,643.13 feet, more or less, to the **POINT OF BEGINNING**.

Said parcel contains 232,060 S.F. or 5.327 acres, more or less.

Parcel 2: Temporary Easement

BEGINNING at the aforementioned **POINT "A"**; thence along the West line of said parcel, N00°06'53"W, a distance of 35.00 feet; thence leaving said West line along the following four (4) courses:

1. N89°17'27"E, a distance of 69.93 feet
2. S00°10'45"E, a distance of 2,713.29 feet
3. N89°28'30"E, a distance of 1,317.38 feet
4. S00°21'23"E, a distance of 2,701.91 feet, more or less,

to a point on the South line of said parcel, said point also being a point on the East-West centerline of said Section 13; thence along said South line, S89°25'36"W, a distance of 35.00 feet; thence leaving said South line along the following four (4) courses:

1. N00°21'23"W, a distance of 2,666.94 feet
2. S89°28'30"W, a distance of 1,307.50 feet
3. N00°10'45"W, a distance of 2,643.28 feet
4. S89°17'27"W, a distance of 44.97 feet

to the **POINT OF BEGINNING**.

Said parcel contains 214,537 S.F. or 4.925 acres, more or less.

Stewart L. Mapes, Jr.
Colorado Professional Land Surveyor No. 38245
For and on behalf of Clark Land Surveying, Inc.



EXHIBIT A

October 20, 2017

A portion of that parcel of land being owned or formerly owned by CS 2005 Investments LLC, El Paso County, Colorado, 2017 Assessors Schedule No. 5500000324, located in the Northwest Quarter of Section 12, Township 15 South, Range 65 West of the 6th Principal Meridian, being more particularly described as follows:

Parcel 1: 30' Permanent Easement

BEGINNING at the East Center corner of the Northwest Quarter of said Section 12; thence along the East-West Centerline of said Section 12 and along the South boundary of said parcel S89°17'26"W (Bearings are based on Colorado State Place Coordinate System, Central Zone, North American Datum 1983. The bearing of the South line of the Southeast Quarter of the Northwest Quarter, marked at the West end by a 3" Axle and at the East end by a 3/4" Aluminum Cap "LS 16109 2004", bears N88°24'38"E, having a measured distance of 1,325.73 feet) a distance of 1,012.83 feet more or less to the Southwest corner of said parcel, said point also being the Southeast corner of a parcel of land described at Reception No. 214000553, recorded in said County; thence leaving said south line, along the East boundary line of said parcel, N00°07'01"W, a distance of 1,739.49 feet, more or less, to the Southerly right-of-way line of Bradley Road; thence leaving said East line, along said Southerly right-of-way line, N76°10'58"E, a distance of 30.88 feet; thence leaving said Southerly right-of-way line, along the following two (2) courses:

1. S00°07'01"E, a distance of 1,716.49 feet
2. N89°17'26"E, a distance of 982.83 feet

to a point on the Westerly boundary line of a parcel of land described at Reception No. 215091608, recorded in said County, said point also being herein after known as **Point "A"**; thence along said boundary line, S00°06'53"E, a distance of 30.00 feet to the **POINT OF BEGINNING**.

Said parcel contains 81,775 S.F. or 1.877 acres, more or less.

Parcel 2: 35' Temporary Easement

BEGINNING at the aforementioned **Point "A"**; thence S89°17'26"W, a distance of 982.83 feet; thence N00°07'01"W, a distance of 1,716.49 feet, more or less, to the Southerly right-of-way line of Bradley Road; thence along said Southerly right-of-way line, N76°10'58"E, a distance of 36.02 feet; thence leaving said Southerly right-of-way line, along the following two (2) courses:

1. S00°07'01"E, a distance of 1,689.66 feet
2. S89°17'27"W, a distance of 947.83 feet

to a point on the Westerly boundary line of said parcel of land described at Reception No. 215091608, recorded in said County; thence along said Westerly boundary line S00°06'53"E, a distance of 35.00 feet to the **POINT OF BEGINNING**.

Said parcel contains 93,934 S.F. or 2.144 acres, more or less.

Stewart L. Mapes, Jr.
Colorado Professional Land Surveyor No. 38245
For and on behalf of Clark Land Surveying, Inc.



EXHIBIT A

October 20, 2017
 REVISED: November 01, 2017

A portion of that parcel of land owned by or formerly owned by CS 2005 Investments LLC, El Paso County, Colorado, 2017 Assessor's Schedule No. 5500000385, located in the Southwest Quarter of Section 1 and the Southeast Quarter of Section 2, Section 11 & Section 12, Township 15 South, Range 65 West of the 6th Principal Meridian, being more particularly described as follows:

Parcel 1: 30' Permanent Easement

COMMENCING at the Southeast corner of said Section 2; thence along the East line of said Section 2, N00°23'37"W (Bearings are based on Colorado State Plane Coordinate System, Central Zone, North American Datum 1983. The bearing of the South line of the Southeast Quarter of the Northwest Quarter, marked at the West end by a 3" Axle and at the East end by a 3¼" Aluminum Cap "LS 16109 2004", bears N88°24'38"E, having a measured distance of 1,325.73 feet), a distance of 1,316.03 feet, more or less, to a point on the South line of a parcel of land described at Reception No. 214004738, recorded in the records of said County, also being the **POINT OF BEGINNING**; thence leaving said East line and along said South line, N89°38'41"E, a distance of 89.91 feet; thence leaving said South line, along the following eight (8) courses:

1. S00°23'54"E, a distance of 30.00 feet;
2. S00°23'54"E, a distance of 589.86 feet
3. S15°08'04"W, a distance of 332.73 feet
4. S12°23'28"W, a distance of 302.48 feet
5. S06°46'55"E, a distance of 282.03 feet
6. S14°10'19"E, a distance of 519.16 feet
7. N76°11'00"E, a distance of 268.93 feet
8. S13°49'00"E, a distance of 30.00 feet

to a point on the Northerly right-of-way line of Bradley Road; thence along said Northerly right-of-way line, S76°11'00"W, a distance of 303.53, feet to a point on the East line of an easement described at Reception No. 21400554; thence leaving said Northerly right-of-way line, along said East line, the following eight (8) courses:

1. N02°58'44"W, a distance of 24.65 feet
2. N14°10'19"W, a distance of 526.70 feet
3. N06°46'55"W, a distance of 289.03 feet
4. N12°23'28"E, a distance of 308.27 feet
5. N15°08'04"E, a distance of 329.36 feet
6. N00°23'54"W, a distance of 585.79 feet, to a point hereinafter known as **POINT "A"**;
7. S89°38'41"W, a distance of 309.93 feet
8. N00°21'49"W, a distance of 30.00 feet

more or less, to a point on said South line; thence along said South line, N89°38'41"E, a distance of 250.00 feet, to the **POINT OF BEGINNING**.

Said parcel contains 80,024 S.F. or 1.837 acres, more or less.

Parcel 2: Temporary Easement

BEGINNING at the aforementioned **POINT "A"**; thence N89°38'41"E, a distance of 30.00 feet; thence N00°23'54"W, a distance of 30.00 feet, to a point on said South line; thence along said South line, N89°38'41"E, a distance of 35.00 feet; thence leaving said South line, along the following seven (7) courses:

1. S00°23'54"E, a distance of 624.65 feet
2. S15°08'04"W, a distance of 336.67 feet
3. S12°23'28"W, a distance of 295.74 feet
4. S06°46'55"E, a distance of 273.85 feet
5. S14°10'19"E, a distance of 482.11 feet
6. N76°11'00"E, a distance of 269.15 feet
7. S13°49'00"E, a distance of 65.00 feet

to a point on the Northerly right-of-way line of Bradley Road; thence along said Northerly right-of-way line, S76°11'00"W, a distance of 35.00 feet; thence leaving said Northerly right-of-way line, along the following nine (9) courses:

1. N13°49'00"W, a distance of 30.00 feet
2. S76°11'00"W, a distance of 268.93 feet
3. N14°10'19"W, a distance of 519.16 feet
4. N06°46'55"W, a distance of 282.03 feet
5. N12°23'28"E, a distance of 302.48 feet
6. N15°08'04"E, a distance of 332.73 feet
7. N00°23'54"W, a distance of 554.86 feet
8. S89°38'41"W, a distance of 374.95 feet
9. N00°21'49"W, a distance of 65.00 feet

to a point on said South line; thence along said South line, N89°38'41"E, a distance of 35.00 feet; thence leaving said South line, along the following two (2) courses:

1. S00°21'49"E, a distance of 30.00 feet
2. N89°38'41"E, a distance of 309.93 feet

to the **POINT OF BEGINNING**.

Said parcel contains 96,464 S.F. or 2.215 acres, more or less.

Stewart L. Mapes, Jr.
Colorado Professional Land Surveyor No. 38245
For and on behalf of Clark Land Surveying, Inc.



Appendix B

Financial Assurance Estimate

2015 Financial Assurance Estimate Form (with pre-plat construction)

8/6/2015

| | |
|--------------------------------------|-------------------|
| Project Information | |
| VA PPNC Water Delivery System | 12/19/2017 |
| Project Name _____ | Date _____ |

| Section 1 - Grading and Erosion Control BMPs | Quantity | Units | Price | % | Remaining |
|--|----------|-------|------------|----------------|----------------|
| | | | | Complete | |
| Earthwork* | 300.00 | CY | @ \$ 5 | = \$ 1,500.00 | \$ 1,500.00 * |
| Permanent Seeding* (inc. noxious weed mgmt.) | 32.50 | AC | @ \$ 582 | = \$ 18,915.00 | \$ 18,915.00 * |
| Mulching* | 32.50 | AC | @ \$ 507 | = \$ 16,477.50 | \$ 16,477.50 * |
| Permanent Erosion Control Blanket* | | SY | @ \$ 6 | = \$ | \$ - * |
| Temporary Erosion Control Blanket | | SY | @ \$ 3 | = \$ | \$ - |
| Vehicle Tracking Control | | EA | @ \$ 1,625 | = \$ | \$ - |
| Safety Fence | | LF | @ \$ 3 | = \$ | \$ - |
| Silt Fence | 870.00 | LF | @ \$ 4 | = \$ 3,480.00 | \$ 3,480.00 |
| Temporary Seeding | | AC | @ \$ 485 | = \$ | \$ - |
| Temporary Mulch | | AC | @ \$ 507 | = \$ | \$ - |
| Erosion Bales | 40.00 | EA | @ \$ 21 | = \$ 840.00 | \$ 840.00 |
| Erosion Logs | 930.00 | LF | @ \$ 6 | = \$ 5,580.00 | \$ 5,580.00 |
| Rock Ditch Checks | | EA | @ \$ | = \$ | \$ - |
| Inlet Protection | | EA | @ \$ 153 | = \$ | \$ - |
| Sediment Basin | | EA | @ \$ 1,625 | = \$ | \$ - |
| Concrete Washout Basin | 1.00 | EA | @ \$ 776 | = \$ 776.00 | \$ 776.00 |
| | | @ \$ | | = \$ | \$ - |
| * Subject to defect warranty financial assurance. DO NOT ENTER MORE THAN 80% COMPLETE. A minimum of 20% to be retained up to preliminary acceptance process. | | | | = \$ 47,568.50 | \$ 47,568.50 |
| Section 1 Subtotal | | | | \$ | |

| Section 2 - Public Improvements** | Quantity | Units | Price | % | Remaining |
|---------------------------------------|----------|-------|--------------|----------|-----------|
| | | | | Complete | |
| - Roadway Improvements | | | | | |
| Construction Traffic Control | | LS | @ \$ | = \$ | \$ - * |
| Aggregate Base Course | | Tons | @ \$ 18 | = \$ | \$ - * |
| Asphalt Pavement | | Tons | @ \$ 65 | = \$ | \$ - * |
| Raised Median, Paved | | SF | @ \$ 7 | = \$ | \$ - * |
| Electrical Conduit, Size = | | LF | @ \$ 14 | = \$ | \$ - * |
| Traffic Signal, complete intersection | | EA | @ \$ 250,000 | = \$ | \$ - * |
| Regulatory Sign | | EA | @ \$ 100 | = \$ | \$ - * |
| Advisory Sign | | EA | @ \$ 100 | = \$ | \$ - * |
| Guide/Street Name Sign | | EA | @ \$ | = \$ | \$ - * |
| Epoxy Pavement Marking | | SF | @ \$ 12 | = \$ | \$ - * |
| Thermoplastic Pavement Marking | | SF | @ \$ 22 | = \$ | \$ - * |
| Barricade - Type 3 | | EA | @ \$ 115 | = \$ | \$ - * |
| Delineator (Type I) | | EA | @ \$ 21 | = \$ | \$ - * |
| Curb and Gutter, Type C (Ramp) | | LF | @ \$ 21 | = \$ | \$ - * |
| Curb and Gutter, Type A (6" Vertical) | | LF | @ \$ 16 | = \$ | \$ - * |
| Curb and Gutter, Type B (Median) | | LF | @ \$ 13 | = \$ | \$ - * |
| Pedestrian Ramp | | SY | @ \$ 108 | = \$ | \$ - * |

| | | | | | | | | |
|---|--|----|---|----------|---|----|------|---|
| Cross Pan | | SY | @ | \$ 53 | = | \$ | \$ - | * |
| Curb Chase | | EA | @ | \$ 1,300 | = | \$ | \$ - | * |
| Guardrail Type 3 (W-Beam) | | LF | @ | \$ 18 | = | \$ | \$ - | * |
| Guardrail Type 7 (Concrete) | | LF | @ | \$ 67 | = | \$ | \$ - | * |
| Guardrail End Anchorage | | EA | @ | \$ 1,978 | = | \$ | \$ - | * |
| Guardrail Impact Attenuator | | EA | @ | \$ 3,564 | = | \$ | \$ - | * |
| Sound Barrier Fence | | LF | @ | \$ 100 | = | \$ | \$ - | * |
| - Storm Drain Improvements | | | | | | | | |
| Concrete Box Culvert (M Standard), Size (W x H) | | LF | @ | \$ | = | \$ | \$ - | * |
| Reinforced Concrete Pipe (RCP) Size | | LF | @ | \$ | = | \$ | \$ - | * |
| 18" Reinforced Concrete Pipe | | LF | @ | \$ 69 | = | \$ | \$ - | * |
| 24" Reinforced Concrete Pipe | | LF | @ | \$ 84 | = | \$ | \$ - | * |
| 30" Reinforced Concrete Pipe | | LF | @ | \$ 94 | = | \$ | \$ - | * |
| 36" Reinforced Concrete Pipe | | LF | @ | \$ 124 | = | \$ | \$ - | * |
| 42" Reinforced Concrete Pipe | | LF | @ | \$ 134 | = | \$ | \$ - | * |
| 48" Reinforced Concrete Pipe | | LF | @ | \$ 178 | = | \$ | \$ - | * |
| 54" Reinforced Concrete Pipe | | LF | @ | \$ 182 | = | \$ | \$ - | * |
| 60" Reinforced Concrete Pipe | | LF | @ | \$ 216 | = | \$ | \$ - | * |
| 66" Reinforced Concrete Pipe | | LF | @ | \$ 263 | = | \$ | \$ - | * |
| 72" Reinforced Concrete Pipe | | LF | @ | \$ 283 | = | \$ | \$ - | * |
| Corrugated Steel Pipe (CSP) Size | | LF | @ | \$ | = | \$ | \$ - | * |
| 18" Corrugated Steel Pipe | | LF | @ | \$ 66 | = | \$ | \$ - | * |
| 24" Corrugated Steel Pipe | | LF | @ | \$ 96 | = | \$ | \$ - | * |
| 30" Corrugated Steel Pipe | | LF | @ | \$ 101 | = | \$ | \$ - | * |
| 36" Corrugated Steel Pipe | | LF | @ | \$ 136 | = | \$ | \$ - | * |
| 42" Corrugated Steel Pipe | | LF | @ | \$ 147 | = | \$ | \$ - | * |
| 48" Corrugated Steel Pipe | | LF | @ | \$ 169 | = | \$ | \$ - | * |
| 54" Corrugated Steel Pipe | | LF | @ | \$ 193 | = | \$ | \$ - | * |
| 60" Corrugated Steel Pipe | | LF | @ | \$ 227 | = | \$ | \$ - | * |
| 66" Corrugated Steel Pipe | | LF | @ | \$ 278 | = | \$ | \$ - | * |
| 72" Corrugated Steel Pipe | | LF | @ | \$ 330 | = | \$ | \$ - | * |
| 78" Corrugated Steel Pipe | | LF | @ | \$ 381 | = | \$ | \$ - | * |
| 84" Corrugated Steel Pipe | | LF | @ | \$ 432 | = | \$ | \$ - | * |
| Flared End Section (FES) RCP † | | EA | @ | \$ | = | \$ | \$ - | * |
| Flared End Section (FES) CSP † | | EA | @ | \$ | = | \$ | \$ - | * |
| End Treatment- Headwall | | EA | @ | \$ | = | \$ | \$ - | * |
| End Treatment- Wingwall | | EA | @ | \$ | = | \$ | \$ - | * |
| End Treatment - Cutoff Wall | | EA | @ | \$ | = | \$ | \$ - | * |
| Curb Inlet (Type R) L=5', Depth < 5 feet | | EA | @ | \$ 3,791 | = | \$ | \$ - | * |
| Curb Inlet (Type R) L=5', 5'-10' Depth | | EA | @ | \$ 5,044 | = | \$ | \$ - | * |
| Curb Inlet (Type R) L =5' , 10'-15' Depth | | EA | @ | \$ 6,027 | = | \$ | \$ - | * |
| Curb Inlet (Type R) L =10' , Depth < 5 feet | | EA | @ | \$ 5,528 | = | \$ | \$ - | * |
| Curb Inlet (Type R) L =10' , 5'-10' Depth | | EA | @ | \$ 6,694 | = | \$ | \$ - | * |
| Curb Inlet (Type R) L =10' , 10'-15' Depth | | EA | @ | \$ 7,500 | = | \$ | \$ - | * |
| Curb Inlet (Type R) L =15' , Depth < 5 feet | | EA | @ | \$ 7,923 | = | \$ | \$ - | * |
| Curb Inlet (Type R) L =15' , 5'-10' Depth | | EA | @ | \$ 8,000 | = | \$ | \$ - | * |
| Curb Inlet (Type R) L =15' , 10'-15' Depth | | EA | @ | \$ 8,800 | = | \$ | \$ - | * |
| Curb Inlet (Type R) L =20' , Depth < 5 feet | | EA | @ | \$ 8,000 | = | \$ | \$ - | * |
| Curb Inlet (Type R) L =20' , 5'-10' Depth | | EA | @ | \$ 8,830 | = | \$ | \$ - | * |
| Curb Inlet (Type R) L = ___' , ___' - ___' Depth | | EA | @ | \$ | = | \$ | \$ - | * |
| Curb Inlet (Type R) L = ___' , ___' - ___' Depth | | EA | @ | \$ | = | \$ | \$ - | * |
| Grated Inlet (Type C), < 5' deep | | EA | @ | \$ 3,270 | = | \$ | \$ - | * |
| Grated Inlet (Type D), < 5' deep | | EA | @ | \$ 3,908 | = | \$ | \$ - | * |
| Storm Sewer Manhole, Box Base, Depth < 15 feet | | EA | @ | \$ 8,592 | = | \$ | \$ - | * |
| Storm Sewer Manhole, Slab Base, Depth < 15 feet | | EA | @ | \$ 4,575 | = | \$ | \$ - | * |
| Geotextile (Erosion Control) | | SY | @ | \$ 5 | = | \$ | \$ - | * |

| | | | | | | | | | | | |
|---|--|----|---|----|---------------------------|---|----|--|----|---|----|
| Rip Rap, d50 Size from 6" to 24" | | CY | @ | \$ | \$98 | = | \$ | | \$ | - | * |
| Rip Rap, Grouted | | CY | @ | \$ | \$215 | = | \$ | | \$ | - | * |
| Drainage Channel Construction, Size (W x H) | | LF | @ | \$ | | = | \$ | | \$ | - | * |
| Channel Lining, Concrete | | CY | @ | \$ | \$450 | = | \$ | | \$ | - | * |
| Channel Lining, Rip Rap | | CY | @ | \$ | \$98 | = | \$ | | \$ | - | * |
| Channel Lining, Grass | | AC | @ | \$ | \$1,287 | = | \$ | | \$ | - | * |
| Channel Lining, Other Stabilization | | SY | @ | \$ | \$3 | = | \$ | | \$ | - | * |
| Detention Outlet Structure (Orifice Plate) | | EA | @ | \$ | | = | \$ | | \$ | - | * |
| Detention Emergency Spillway | | EA | @ | \$ | | = | \$ | | \$ | - | * |
| Permanent Water Quality Facility (Describe) | | EA | @ | \$ | | = | \$ | | \$ | - | * |
| <p>* Subject to defect warranty financial assurance. DO NOT ENTER MORE THAN 80% COMPLETE. A minimum of 20% to be retained up to preliminary acceptance process. † For flared end sections, multiply pipe LF cost by 6</p> | | | | | | | | | | | ** |
| | | | | | Section 2 Subtotal | = | \$ | | | | |

| Section 3 - Common Development Improvements (Private or District)*** | Quantity | Units | Price | | | % Complete | Remaining |
|---|----------|-------|----------|---------------------------|----|---------------|-----------|
| - Roadway Improvements | | | | | | | |
| (Include any applicable items from above Public Improvements list, that are to be private and NOT maintained by El Paso County) | | @ | \$ | = | \$ | | \$ - |
| | | @ | \$ | = | \$ | | \$ - |
| | | @ | \$ | = | \$ | | \$ - |
| Concrete Sidewalk | | SY @ | \$ 38 | = | \$ | | \$ - |
| | | @ | \$ | = | \$ | | \$ - |
| | | @ | \$ | = | \$ | | \$ - |
| - Storm Drain Improvements | | | | | | | |
| (Include any applicable items from above Public Improvements list, that are to be private and NOT maintained by El Paso County) | | @ | \$ | = | \$ | | \$ - |
| | | @ | \$ | = | \$ | | \$ - |
| | | @ | \$ | = | \$ | | \$ - |
| Detention Outlet Structure Modifications | | @ | \$ 5,000 | = | \$ | | \$ - |
| | | @ | \$ | = | \$ | | \$ - |
| | | @ | \$ | = | \$ | | \$ - |
| - Water System Improvements | | | | | | | |
| Water Main Pipe (PVC), Size 8" | | LF @ | \$ 94 | = | \$ | | \$ - |
| Water Main Pipe (Ductile Iron), Size 8" | | LF @ | \$ 137 | = | \$ | | \$ - |
| Gate Valves, 8" | | EA @ | \$ 1,852 | = | \$ | | \$ - |
| Fire Hydrant Assembly w/ all valves | | EA @ | \$ 6,430 | = | \$ | | \$ - |
| Water Service Line Installation, including tap and valves | | EA @ | \$ 1,253 | = | \$ | | \$ - |
| Fire Cistern Installation, complete | | EA @ | \$ | = | \$ | | \$ - |
| - Sanitary Sewer Improvements | | | | | | | |
| Sewer Main Pipe (PVC), Size 8" | | LF @ | \$ 94 | = | \$ | | \$ - |
| Sanitary Sewer Manhole, Depth < 15 feet | | EA @ | \$ 4,575 | = | \$ | | \$ - |
| Sanitary Service Line Installation, complete | | EA @ | \$ 1,516 | = | \$ | | \$ - |
| Sanitary Sewer Lift Station, complete | | EA @ | \$ | = | \$ | | \$ - |
| - Landscaping (If Applicable) | | | | | | | |
| (List landscaping line items and cost - usually only in case of subdivision specific condition of approval, or PUD) | | EA @ | \$ | = | \$ | | \$ - |
| | | EA @ | \$ | = | \$ | | \$ - |
| | | EA @ | \$ | = | \$ | | \$ - |
| | | EA @ | \$ | = | \$ | | \$ - |
| | | EA @ | \$ | = | \$ | | \$ - |
| ***items in this section are not subject to defect warranty financial assurance | | | | | | | |
| | | | | Section 3 Subtotal | = | \$ | |

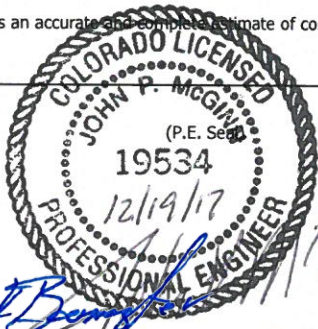
Financial Assurance Totals

| | | |
|---|---|--------------------|
| As-built drawings - (FILL IN IF THERE ARE ANY PUBLICLY-MAINTAINED IMPROVEMENTS) | | \$ |
| (Inc. survey to verify detention pond volumes.) | Total Construction Financial Assurance | \$47,568.50 |
| | (Sum of all section subtotals) | |
| | Total Remaining Construction Financial Assurance | 47,568.50 |
| | (Sum of all section totals less credit for items complete) | |
| | Total Defect Warranty Financial Assurance | \$7,378.50 |
| | (20% of all items identified as public improvements(*). To be collateralized at time of preliminary acceptance) | |

Approvals

I hereby certify that this is an accurate and complete estimate of costs for the work as shown on the approved Construction Drawings associated with the Project.

Engineer



John P. McGinn

Date

December, 19, 2017

Approved by Owner / Applicant

Date

12/20/2017

Approved by El Paso County Engineer / ECM Administrator

Date

Appendix C
Geotechnical Soils Report

**GEOTECHNICAL INVESTIGATION
VAPPNC PUMP STATION,
WATER STORAGE TANK, AND
RAW WATER PIPELINE
BETWEEN DRENNAN ROAD AND
BRADLEY ROAD
EL PASO COUNTY, COLORADO**

Prepared For:

JDS-HYDRO CONSULTING, INC.
545 East Pikes Peak Avenue, Suite 300
Colorado Springs, Colorado 80903

Attention: Ms. Gwen Dall

CTL|T Project No. CS18779-125

August 1, 2017

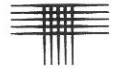


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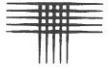
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| PROPOSED CONSTRUCTION..... | 3 |
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FIG. 1 – LOCATION OF EXPLORATORY BORINGS

FIGS. 2 THROUGH 5 – SUMMARY LOGS OF EXPLORATORY BORINGS

APPENDIX A – LABORATORY TEST RESULTS

TABLE A-1 SUMMARY OF LABORATORY TESTING



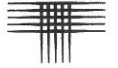
SCOPE

This report presents the results of our Geotechnical Investigation for a proposed pump station, water equalization tank, and water pipeline to be constructed, to provide irrigation to the future Pike Peak National Cemetery to be located southeast of the intersection of Drennan Road and Marksheffel Road, east of Colorado Springs, Colorado (Fig. 1). The purpose of our investigation was to evaluate subsurface conditions at the site of the proposed pump station, water equalization tank, and along the proposed water pipeline alignment in order to provide geotechnical recommendations and criteria for design, construction, and planned excavations for the proposed foundations and water line. The scope of our services was described in our proposal (CS-17-0079) that was revised on May 26, 2107. Evaluation of the property for the possible presence of potentially hazardous materials (Environmental Site Assessment) was beyond the scope of this investigation.

This report was prepared from data developed during our field exploration, laboratory testing, engineering analysis, and our experience. The design criteria presented in the report were based on our understanding of the planned construction. If changes occur, we should review the revised plans to determine their effect on our recommendations. The following section summarizes the report. More detailed descriptions of subsurface conditions, as well as our design and construction recommendations, are presented in the report.

SUMMARY

1. Subsurface conditions encountered in our exploratory borings typically consisted of slightly sandy to very sandy clay and/or slightly silty to silty sand, 3 to over 25 feet thick, underlain by claystone bedrock in most of our borings.
2. At the time of drilling, groundwater was not encountered in our fifteen exploratory borings. We did not encounter groundwater in our exploratory borings when measured one day following the comple-



tion of our drilling operations. Groundwater levels will fluctuate with seasonal precipitation.

3. Shallow, medium hard to very hard bedrock (depths of five feet or less below the ground surface) was encountered at five of our boring locations along water line alignment, at the pump station, and equalization tank locations (TH-1, TH-2, TH-5, TH-6, and TH-14). The presence of the shallow bedrock may affect the excavation rate of the water line.
4. We believe the proposed pump station can be constructed using a spread footing and slab on grade foundation and the proposed equalization water tank can be constructed on two feet of pea gravel bedding materials. The foundation of the pump station site will require a subexcavation layer consisting of the on-site soils. Foundation alternatives are discussed in this report.
5. Surface drainage should be designed, constructed, and maintained to provide rapid removal of runoff away from the proposed structure.

SITE CONDITIONS

The proposed pump station, water equalization tank, and water line are to be constructed at the site will be located east of Marksheffel Road, between Drennan Road and Fontain Boulevard, east of Colorado Springs, Colorado. The general vicinity of the facilities is shown in Fig. 1. The ground surface at the pump station, along the water line alignment, and at the location of the water equalization tank varies by location. The ground surface at the pump station is sloped to the southwest at grades of 5 percent or less with boring elevations at about 5,776 feet above sea level. The ground surface of our exploratory borings at the proposed water equalization tank location is at about 5,946 feet above sea level and the ground surface sloped toward the northeast to grades of 2 percent or less. Along the water line alignment, the ground surface experiences a change in elevation of approximately nearly 170 feet from the north end (equalization tank) to the south end (pump station), with rolling hills throughout. Vegetation consists of grasses and weeds.

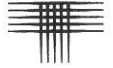


PROPOSED CONSTRUCTION

We understand a pump station is to be constructed approximately 4,500 feet east of the intersection of Fontain Boulevard and Old Glory Drive. The pump station construction is planned as a one story, prefabricated metal building, with approximate dimensions of 38 feet by 50 feet. We understand preliminary building footprint elevation is estimated to be at 5,780 to 5,785; approximately 5 to 10 feet higher in elevation than our exploratory borings (TH-14 and TH-15). The structure is to house the pumping equipment for the water line. Foundation loads are expected to be light.

The planned equalization tank is to be constructed on the north end of the project site and be located near the southeast corner of the proposed veteran's cemetery. The equalization tank is planned to be constructed as a fiberglass tank with the bottom of the tank estimated to be about 12 feet below existing grades and be constructed with about 2 feet of cover materials. The size of the tank is not known.

The proposed water line is to be installed about 2 miles east of Marksheffel Boulevard, between Drennan Road and Fontian Boulevard. The proposed alignment generally located within vacant, undeveloped grassland. The pipeline will cross existing infrastructure and associated right-of-way's. The total length of the water line alignment is approximately 2.5 miles, between the proposed pump station to the south and the equalization tank to the north. We understand the water line will be buried at a depth of 5.5 feet and at greater depths in areas along the alignment. Approximate locations of the facilities and water line are presented on Fig. No. 1. Specific plans or details for the construction of the pump station or water equalization tank were not available.



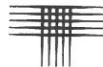
SITE GEOLOGY

Geologic mapping from three separate maps (“Geologic Map of the Pueblo 1 X 2 Quadrangle, South Central Colorado”) by Glen R. Scott, Richard B. Taylor, Rudy C. Epis, and Reinhard A. Wobus of the United States Geological Survey (1976); (“Geologic Map of the Corral Bluffs Quadrangle, El Paso County, Colorado”) by Paul E. Soister of the United States Geological Survey (1968); and (“Geologic Map of the Elsmere Quadrangle, El Paso County Colorado”) by Richard B. Madole and Jon P. Thorson of the United States Geological Survey (2002) indicates the site is underlain by Piney Creek Alluvium (Qpc), Slocum Alluvium (Qs), Valley Side Alluvium (Qav), and Pierre Shale (Kp). Conditions encountered in our borings generally confirm the mapping.

INVESTIGATION

Our field investigation included drilling fifteen (15) exploratory borings at the locations requested by JDS-Hydro Consultants as shown on Fig. 1. The borings were advanced to the depths of 15 to 30 feet, as requested by the client, using 4-inch diameter, continuous-flight, solid-stem auger and a truck-mounted drill rig. Drilling was observed by our field representative who logged the conditions found in the borings and obtained samples. Summary logs of the borings, results of field penetration resistance tests, and laboratory test data are presented in Figs. 2 through 5.

Soil and bedrock samples obtained during drilling were returned to our laboratory and visually classified. Laboratory testing was then assigned to representative samples and included moisture content and dry density, swell-consolidation, sieve analysis (passing the No. 200 sieve), unconfined compressive strengths, and water-soluble sulfate concentration tests. The swell test samples were wetted under an applied load that approximated the overburden pressure (the weight of overlying soil). Results of the swell-consolidation testing are presented in Appendix A. Laboratory test data are summarized in Table A-1.



SUBSURFACE CONDITIONS

Subsurface conditions encountered in our exploratory borings consisted of slightly sandy to very sandy clay and/or slightly silty to silty sand, 3 to over 25 feet thick, underlain by claystone bedrock in most borings. Some of the pertinent engineering characteristics of the soils and bedrock encountered, as well as groundwater conditions, are described in the following paragraphs.

Natural Sand and Clay

Natural, slightly sandy to very sandy clay was encountered thirteen of the fifteen exploratory borings at the ground surface. The clay layer was about 3 to over 25 feet thick. Based on field penetration resistance testing performed during drilling operations, the clay was stiff to very stiff. Three of the samples of clay submitted to our laboratory exhibited swell values ranging from 0.6 to 12 percent when wetted under approximate overburden pressures (weight of the overlying soils). One sample subjected to swell consolidation testing in our laboratory exhibited a consolidation of 2.4 percent upon wetting. A sample consolidated to a high degree with increasing load suggesting a collapse prone material. Collapse prone soils are known to exist in this portion of El Paso County. Often the materials swell under light loading.

Slightly silty to silty sand, over 20 feet thick, was encountered at the ground surface and extended to the maximum depths explored of 15 and 20 feet in two of the borings (TH-8 and TH-9). Two samples of the sand tested in our laboratory contained 6 to 25 percent silt and clay-sized particles (passing the No. 200 sieve). Based on experience, the silty sand typically exhibits no swell potential to low measured swells when wetted.



Bedrock

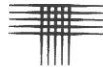
Slightly sandy to sandy claystone bedrock was encountered in ten of the fifteen exploratory borings, below the natural soils, at depths of 3 to 18 feet below the existing ground surface. Occasional layers of weathered claystone about 1.5 to 5 feet thick were encountered overlying the non-weathered claystone in the borings. The bedrock was medium hard (weathered) to very hard. Eleven samples of the claystone, about 1.5 to 5 feet in thickness, tested in our laboratory contained 77 to 99 percent silt and clay-sized particles (passing the No. 200 sieve). Thirteen samples of the claystone exhibited swell consolidation values ranging from 0.0 to 8.4 percent when wetted under approximate over burden pressures (weight of overlying soils).

Groundwater

At the time of drilling, groundwater was not encountered in the fifteen borings drilled at the site. Delayed groundwater measurements did not result in a measured groundwater levels at all locations. Groundwater levels will fluctuate with seasonal precipitation.

Seismicity

This area, like most of south-central Colorado, is subject to a degree of seismic activity. The on-site soils and bedrock are not expected to respond unusually to seismic loading. According to the 2015 International Building Code (2015 IBC) and based on the results of our investigation, we judge the overburden soils at the site classifies as Seismic Site Class D (stiff soil profile). Where bedrock occurs at depths of 15 feet or less, the bedrock at the site classifies as Seismic Site Class C (dense soil and soft rock profile). The subsurface conditions indicate little susceptibility to liquefaction. Wind loads typically govern dynamic structural design in this area for the above ground structure.

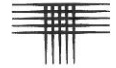


Excavation

Excavations on the order of about 5.5 feet or deeper are planned for the proposed waterline. New foundations of the proposed pump station will include excavations of about 10 feet for subexcavation of the highly expansive soils and bedrock at that location. The equalization tank is planned to be installed with the base of the tank at about 12 feet below existing grades and will include excavations greater than 12 feet to include bedding materials.

Our exploratory borings (TH-14 and TH-15) drilled at the proposed location of the pump station indicated the near-surface materials consist of 5 to 7 feet of slightly sandy, very stiff clay underlain by slightly sandy, hard claystone bedrock. Our boring (TH-1) drilled at the site of the proposed equalization tank indicate near-surface materials consist of 3 feet of sandy, stiff clay underlain by sandy, hard claystone bedrock. We anticipate the near-surface soils and bedrock can be excavated using conventional, heavy-duty equipment. We expect the clay and sand soils, will classify as Type C soils and the bedrock will classify as Type B materials, using Occupational Safety and Health Administration (OSHA) criteria. OSHA require temporary construction slopes be no steeper than 1.5:1 (horizontal to vertical) for Type C soils and 1:1 for Type B materials. Slightly silty to silty sands were encountered at TH- 8 and TH-9 will likely require temporary excavation slopes to be 1.5:1 or flatter. We believe these slope configurations are applicable in the absence of active seepage.

Where the proposed water line crosses existing utilities and infrastructure, such as Bradley Road (TH-5 and TH-6) and the nearby Southern Delivery System Pipeline, plans are likely to include installation using directional boring methods. At these locations, shallow, hard to very hard bedrock is present. We anticipate the presence of the very hard bedrock will complicate the directional boring approach.



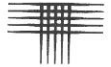
Fill Placement

The existing natural soils are suitable for use as site grading fill, and excavation backfill and sub-excavation backfill, provided they are free of debris, vegetation/organics, and other deleterious materials. If imported fill is necessary, it should ideally consist of granular material with 100 percent passing the 2-inch sieve and contain 30 to 50 percent passing the No. 200 sieve. The import soil should exhibit low plasticity with a Liquid Limit less than 30 and a Plasticity Index less than 15. Import soils similar to the on-site materials may be suitable. A sample of the import material should be submitted to our office for testing before hauling to the site.

Before fill placement, vegetation, topsoil, existing suspect quality fill, and other deleterious material should be removed. Areas to receive fill should be scarified to a depth of at least 8 inches, moisture conditioned within 2 percent over optimum moisture content and compacted to at least 95 percent of standard Proctor maximum dry density (ASTM D 698).

The properties of the fill will affect the performance of foundations and slabs-on-grade, where they occur. Clayey fill and backfill within the building footprint should be placed in thin, loose lifts of 8 inches or less, moisture conditioned to between 1 and 4 percent over optimum moisture content, and compacted to at least 95 percent of maximum standard Proctor dry density (ASTM D 698). In "landscape" areas, fill should be compacted to at least 90 percent and within 2 percent of optimum. Below roadways, the compaction should be compacted to 95 percent and within 2 percent of optimum.

Our experience indicates the use of a self-propelled compactor results in more reliable performance compared to trench backfill compacted by a sheepsfoot wheel attachment on a backhoe or trackhoe. Where differential consolidation of deep fill relative to the cut materials, the cuts should be reduced. The upper portion of the trenches should be widened to allow the use of a self-propelled com-



pactor. The placement and compaction of utility trench backfill should be observed and tested by a representative of our firm during construction.

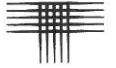
Building Subexcavation Fill

As discussed in the Foundations Section of this report, the near-surface existing soils found on the site exhibit a variety of behaviors when wetted, including low to high expansion potentials. These variable behaviors can result in damaging differential movements. Sub-excavation, in association with spread footing foundations, has been used in the Front Range area with satisfactory performance for the large majority of the sites where this ground modification method has been completed. This procedure is recommended for the pump station. We estimate potential movements of about 2 inches or less, following the sub-excavation process. Differential movements should also be substantially reduced.

To create a more uniform layer of support and thereby reduce the risk of excessive differential shallow foundation movements, we recommend sub-excavation of the structure footprint to a uniform depth of at least 10 feet below the exterior footing elevations for the proposed pump station foundation. The bottom of the sub-excavation zone should extend laterally at least 5 feet beyond the outer edges of the footings. The existing on-site clay soils may be re-used as new, moisture conditioned and compacted sub-excavation backfill. Sub-excavation backfill should be placed, moisture conditioned and densely compacted per the Fill Placement section of this report.

FOUNDATIONS

In our opinion, spread footing foundations should be designed and constructed to be underlain by a layer of subexcavation materials to reduce potential heave and associated damages. Our heave calculations for the pump station site indicate potential heave of 10 inches without subgrade modifications. A depth of wetting of 15 feet was used in our calculations. The recommended subexcavations for the proposed structure can reduce the potential heave to less than about



2 inches. We recommend the pump station be constructed, and underlain by subexcavation fill as described in the following sections, is suitable as the foundation system for the new structure. If less heave is required, a deeper subexcavation will be needed.

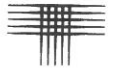
A deep foundation system such as drilled piers are considered a more reliable option to spread footings underlain by a subexcavation layer. We can provide design parameters for deep foundations at your request. Spread footing design parameters are discussed in further detail in the following paragraphs.

Pump Station

Our investigation indicates the soils at anticipated shallow foundation elevations for the pump station consist predominantly of expansive, natural clay soils and claystone bedrock (TH-14 and TH-15). We believe the foundation of the pump station can be constructed using a spread footing supported by a layer of subexcavation materials consisting of the on-site soils placed as described in the Fill Placement Section of this report. Our heave prediction calculations indicate the existing soils can heave up to nearly 10 inches in their current condition. A subexcavation layer can reduce the predicted heave.

The following paragraphs present our design and construction recommendations for the spread footing foundation.

1. Footing foundations should be underlain by at least 10 feet of a subexcavation layer as previously discussed. The excavation should extend laterally a distance of at least 10 feet beyond the outside of the structure.
2. The spread footings can be designed for a maximum allowable soil pressure of 3,000 psf when underlain by the subexcavation layer.
3. We recommend footings beneath continuous foundation walls be at least 16 inches wide. Footings beneath isolated column pads (if needed) should be at least 24 inches square. Larger footing sizes may be required to accommodate the anticipated foundation loads.



4. We recommend designs consider total settlement of 1-inch and differential settlement of 1/2-inch.
5. Permanent connections between any below grade utilities and the proposed pump station should be flexible and capable of accommodating differential movements.
6. Continuous foundation walls should be reinforced to span local anomalies in the subsoils. We recommend the reinforcement required to simply span an unsupported distance of at least 10 feet.
7. Exterior footings must be protected from frost action with a soil cover of at least 30 inches.

Equalization Tank

Our investigation indicates the soils at the anticipated bottom of tank elevation, about 12 feet below grade, for the proposed fiberglass equalization tank consist predominantly of expansive, natural claystone bedrock. Backfill of the tank can consist of pea gravel materials. Fill materials placed to cover the tank should consist of onsite soils placed as backfill and should be placed in accordance with the fill placement section of this report. A sump pump should be installed at the bottom of the excavation to remove water that accumulates at the bottom of the excavation. Our heave calculations resulted in up to 2 inches of heave for the bedrock near the bottom of the tank and up to 3.5 inches at shallower depths.

PIPE CONNECTIONS

Connections and penetrations for piping and controls should be provided with flexibility that allows free vertical movement. Typical connections to the tank should be detailed to withstand movement of at least 2 inches. Once designs are finalized and the size of the tank is known, we can perform settlement calculations based on our geotechnical investigation.



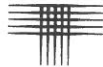
CONCRETE

Concrete in contact with soils can be subject to sulfate attack. We measured soluble sulfate concentrations for five samples from this site. Concentrations were measured between 0.1 and 2.2 percent. Water-soluble sulfate concentrations in soil greater than 2 percent indicate potential for Class 3 exposure to sulfates, according to ACI 201.2R-01 as published in the 2008 ACI Manual of Concrete Practice. One of the tests exceeded this value. The American Concrete Institute (ACI) recommends using a blend of Type V cement and fly ash that meets the performance requirements (ASTM C 1012) of ACI 201, with a maximum water-to-cementitious material ratio of 0.40 and air entrainment of 5 to 7 percent for concrete with Class 3 exposure to sulfates. ACI also indicates concrete with Class 3 exposure should have a minimum compressive strength of 4500 psi.

We understand Type V cement may not be readily available. We believe that concrete made with cement that meets ASTM C 150 Type II requirements, 20 percent fly ash, and a maximum water-to-cementitious material ratio of 0.40 can be used to provide similar resistance. The fly ash should meet ASTM C 618 Class F requirements. The fly ash content can be reduced to 15 percent for placement in cold weather months provided a water-to-cementitious material ratio of 0.40 or less is maintained. We believe this approach should be used as a minimum at this project. The more stringent measures outlined in the previous paragraph will better control risk of sulfate attack and are more in alignment with written industry standards.

SURFACE DRAINAGE

Performance of the pump station foundation system will be influenced, to a large degree, by the moisture conditions existing within the near-surface soils. Overall surface drainage patterns should be planned to provide for the rapid removal of storm runoff. Water should not be allowed to pond adjacent to the struc-



ture. We recommend the following precautions be observed during construction and maintained at all times after the facility is completed.

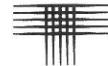
1. Excessive wetting or drying of the open foundation excavation should be avoided.
2. Foundation wall backfill should be graded to provide for the rapid removal of runoff. We recommend a slope equivalent to at least 6 inches in the first 10 feet.
3. Roof downspouts from the above-grade pump station should discharge well away from the structure. Downspout extensions and/or splash blocks should be provided to help reduce infiltration into the backfill adjacent to the structure.

CONSTRUCTION OBSERVATIONS

We recommend that CTL|Thompson, Inc. provide observation and testing services during construction to allow us the opportunity to verify whether soil conditions are consistent with those found during this investigation. If others perform these observations, they must accept responsibility to judge whether the recommendations in this report remain appropriate.

GEOTECHNICAL RISK

The concept of risk is an important aspect with any geotechnical evaluation primarily because the methods used to develop geotechnical recommendations do not comprise an exact science. We never have complete knowledge of subsurface conditions. Our analysis must be tempered with engineering judgment and experience. Therefore, the recommendations presented in any geotechnical evaluation should not be considered risk-free. Our recommendations represent our judgment of those measures that are necessary to increase the chances that the structure will perform satisfactorily. It is critical that all recommendations in this report are followed during construction.



LIMITATIONS

This report has been prepared for the exclusive use of the JDS-Hydro Consultants, Inc. for the purpose of providing geotechnical design and construction criteria for the planned VAPPNC water pipeline and associated pump station and equalization tank. The information, conclusions, and recommendations presented herein are based on consideration of many factors including, but not limited to, the type of structures proposed, the geologic setting, and the subsurface conditions encountered. The conclusions and recommendations contained in the report are not valid for use by others. Standards of practice evolve in the area of geotechnical engineering. The recommendations provided are appropriate for about three years. If the facilities are not constructed within about three years, we should be contacted to determine if we should update this report.

Our borings were drilled at the requested locations to obtain a reasonably accurate indication of subsurface conditions. The borings are representative of conditions encountered at the exact boring locations only. Variations in subsurface conditions between the borings are likely. We recommend a representative of our office observe the completed pump station and equalization tank foundation excavations to verify subsurface conditions are as anticipated from our borings. Representatives of our firm should be present during construction to provide construction observation and materials testing services.

We believe this investigation was conducted with that level of skill and care normally used by geotechnical engineers practicing under similar conditions. No warranty, express or implied, is made.



If we can be of further service in discussing the contents of this report or in the analysis of the influence of subsurface conditions on design of the pump station, equalization tank, and water pipeline from a geotechnical engineering point-of-view, please call.

CTL | THOMPSON, INC.

Patrick Foley, EIT
Staff Engineer

PF:WCH:lc

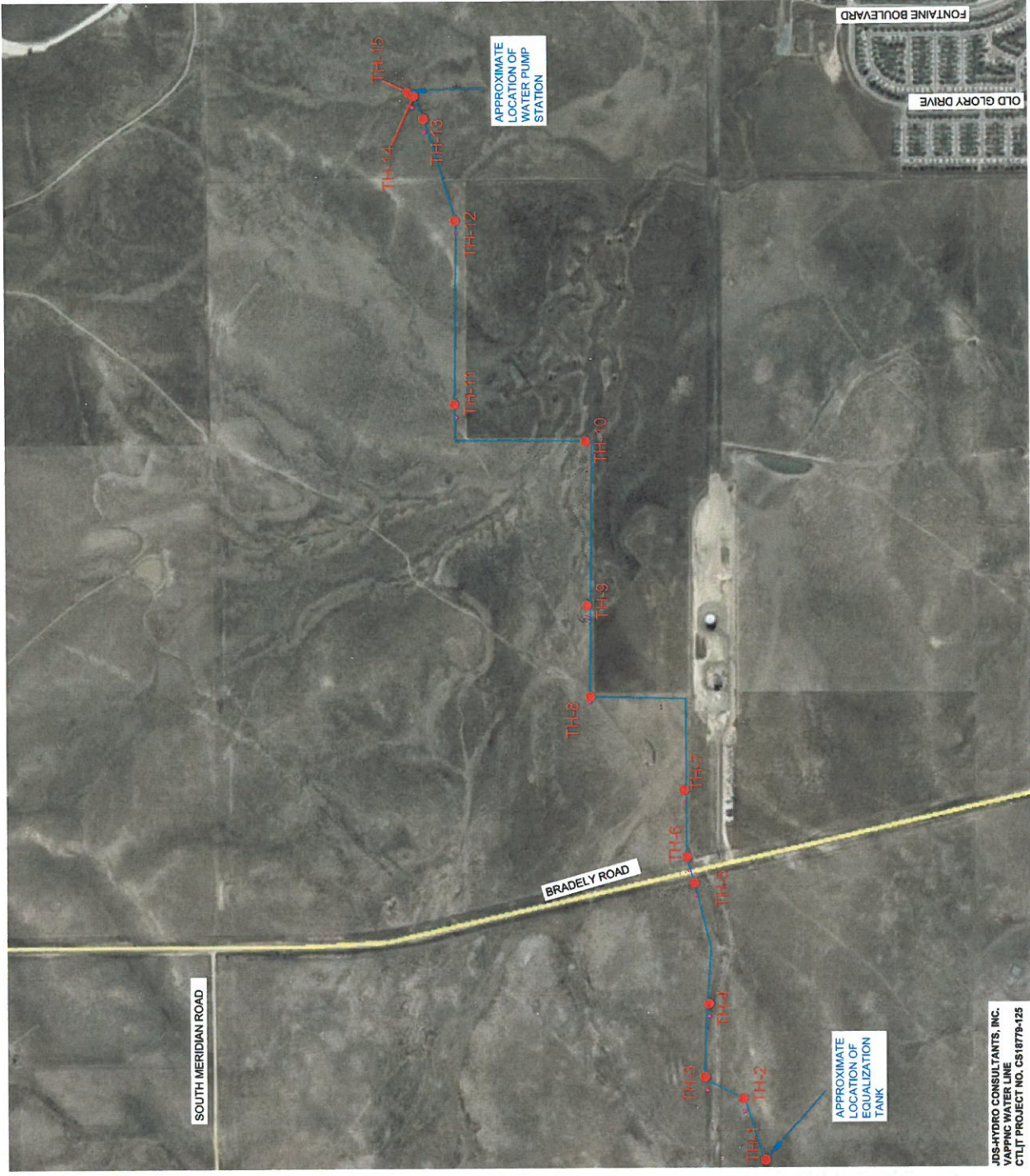
(2 copies sent)

Via email: gdall@jdshydro.com

Reviewed by:

William C. Hoffman, Jr. P.E.
Senior Principal Engineer



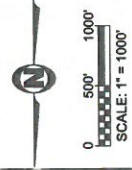


VICINITY MAP

(NOT TO SCALE)

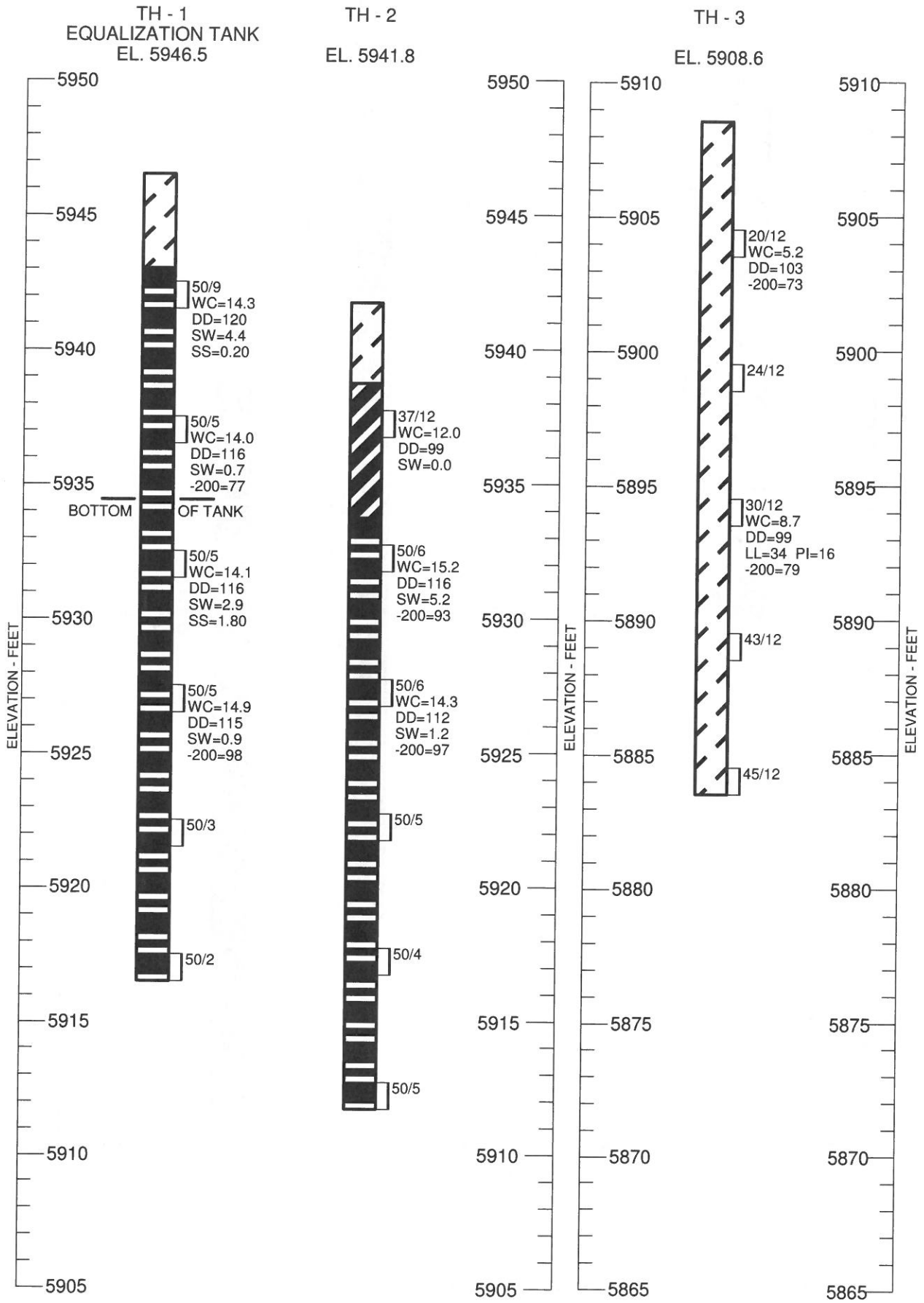
LEGEND:

- TH-1
- APPROXIMATE LOCATION OF EXPLORATORY BORING.
- APPROXIMATE ALIGNMENT OF PROPOSED WATER LINE.

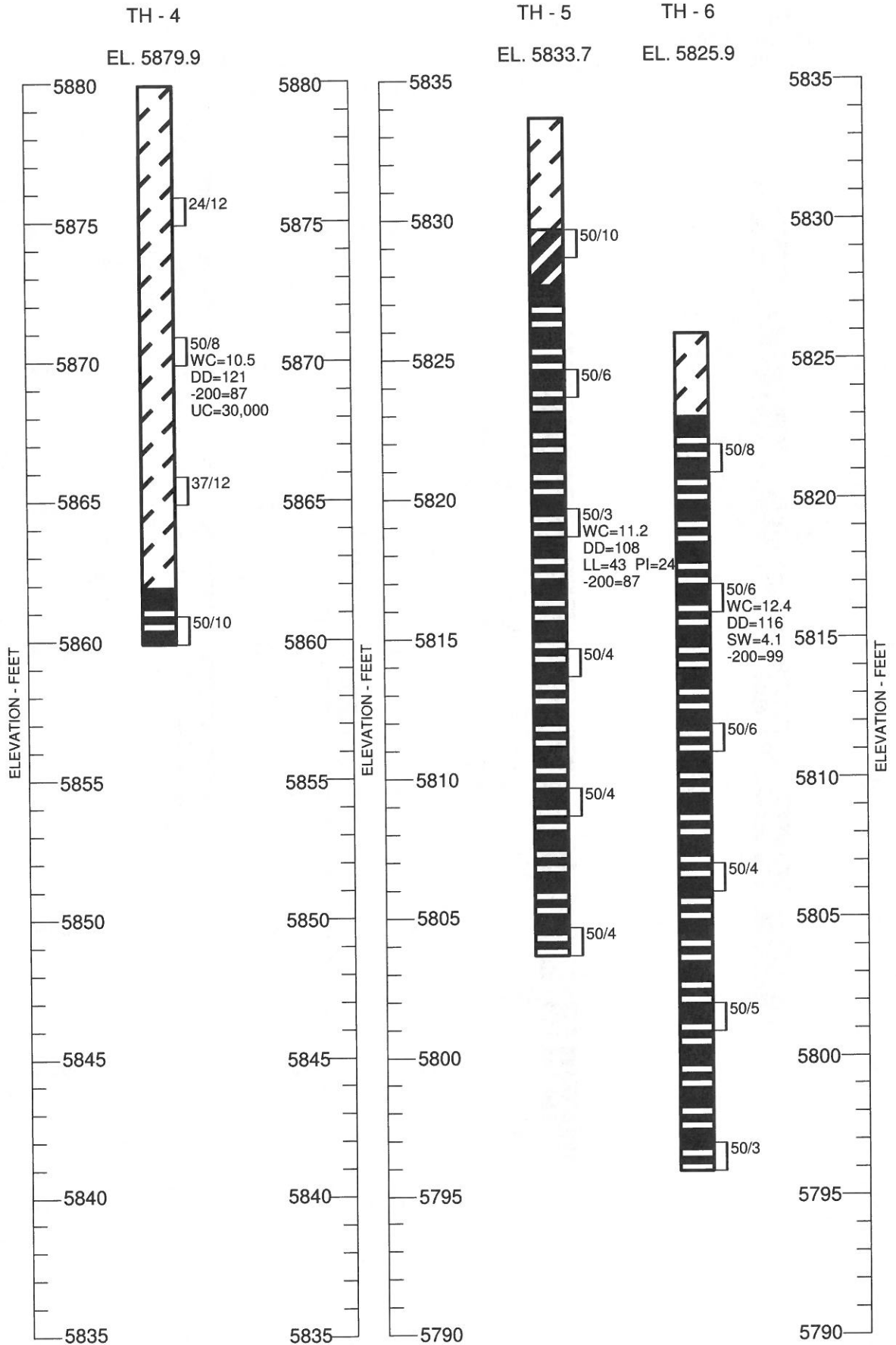


Location of Exploratory Borings

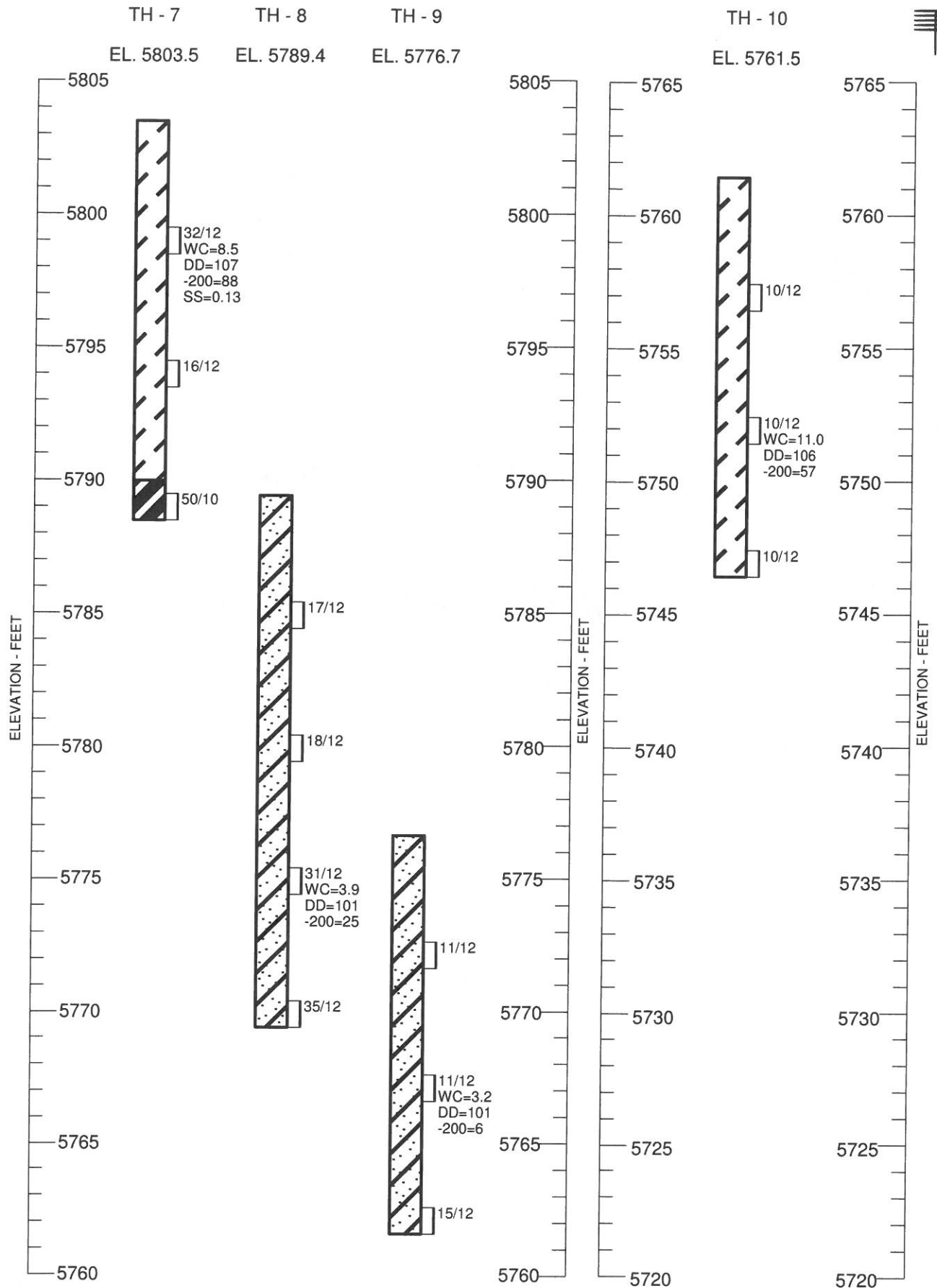
FIG. 1



**Summary Logs of
Exploratory
Borings**









**Summary Logs of
Exploratory
Borings**



**Summary Logs of
Exploratory
Borings**

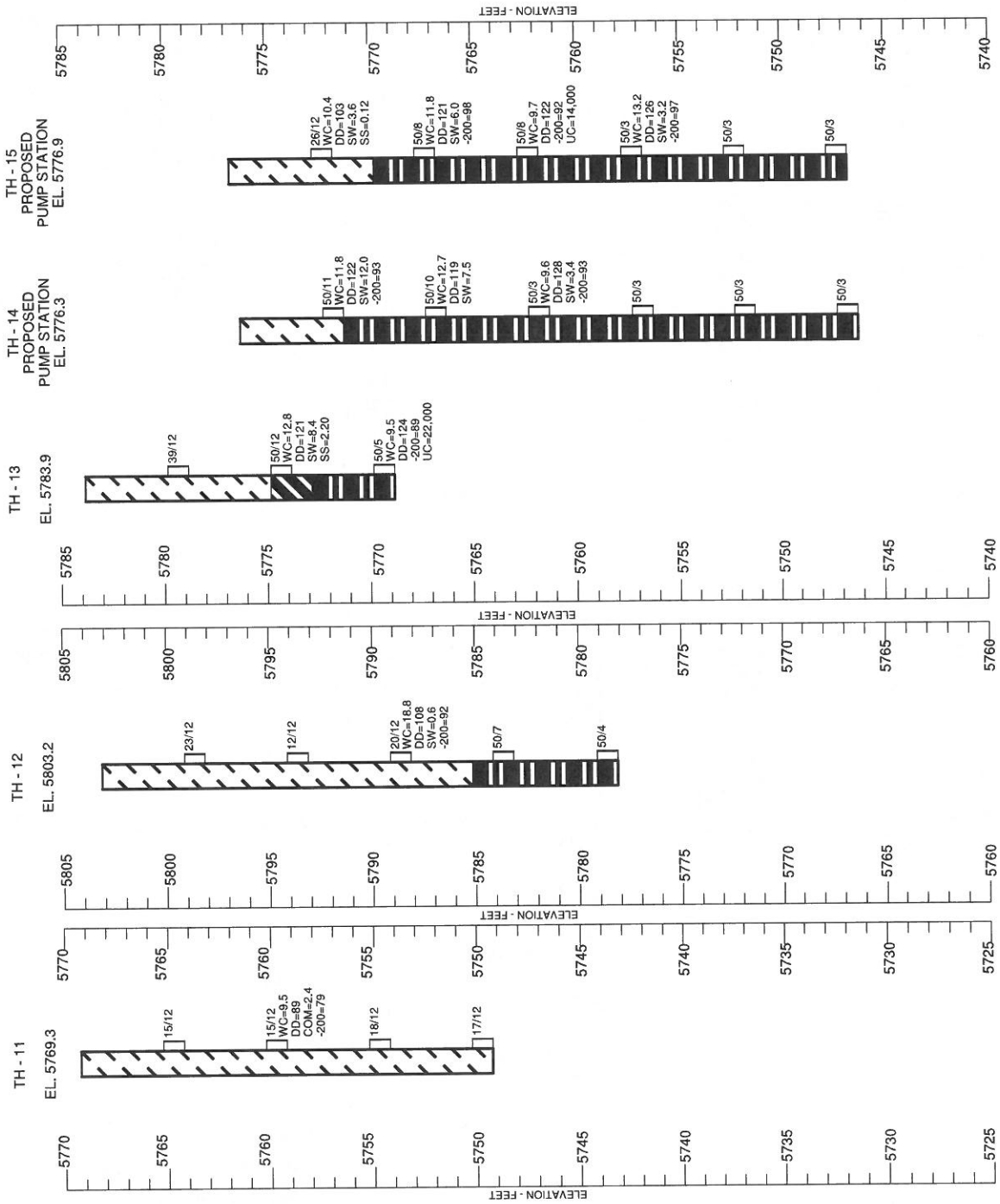


LEGEND:

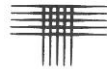
-  CLAY, SLIGHTLY SANDY TO VERY SANDY, STIFF TO VERY STIFF, MOIST, BROWN TO LIGHT BROWN, (CL)
-  SAND, SLIGHTLY SILTY TO SILTY, MEDIUM DENSE TO DENSE, MOIST, LIGHT BROWN TO BROWN, (SP-SM, SW)
-  WEATHERED CLAYSTONE, SANDY, MEDIUM HARD TO HARD, MOIST, LIGHT BROWN TO BROWN.
-  BEDROCK, CLAYSTONE, SLIGHTLY SANDY TO SANDY, HARD TO VERY HARD, MOIST, BROWN.
-  DRIVE SAMPLE, THE SYMBOL 50/9 INDICATES 50 BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE A 2.5-INCH O.D. SAMPLER 9 INCHES.
-  INDICATES DEPTH WHERE THE TEST HOLE CAVED DURING DRILLING.

NOTES:

1. THE BORINGS WERE DRILLED JUNE 7 AND 12, 2017 USING A 4-INCH DIAMETER, CONTINUOUS-FLIGHT AUGER AND A CME-45, TRUCK-MOUNTED DRILL RIG.
2. THESE LOGS ARE SUBJECT TO THE EXPLANATIONS, LIMITATIONS, AND CONCLUSIONS AS CONTAINED IN THIS REPORT.
3. THE BORING ELEVATIONS WERE DETERMINED DURING A FIELD SURVEY PERFORMED BY CLARK SURVEYING.
4. GROUNDWATER WAS NOT ENCOUNTERED IN THE EXPLORATORY BORINGS DURING THIS INVESTIGATION.
5. WC - INDICATES MOISTURE CONTENT, (%)
 DD - INDICATES DRY DENSITY, (PCF)
 SW - INDICATES SWELL WHEN WETTED UNDER ESTIMATED OVERBURDEN PRESSURE, (%)
 COM - INDICATES COMPRESSION WHEN WETTED UNDER ESTIMATED OVERBURDEN PRESSURE, (%)
 LL - INDICATES LIQUID LIMIT, (%)
 (NV : NO VALUE)
 PI - INDICATES PLASTICITY INDEX, (%)
 (NP : NON-PLASTIC)
 -200 - INDICATES PASSING NO. 200 SIEVE, (%)
 SS - INDICATES WATER-SOLUBLE SULFATE CONTENT, (%)
 UC - INDICATES UNCONFINED COMPRESSIVE STRENGTH, (PSF)

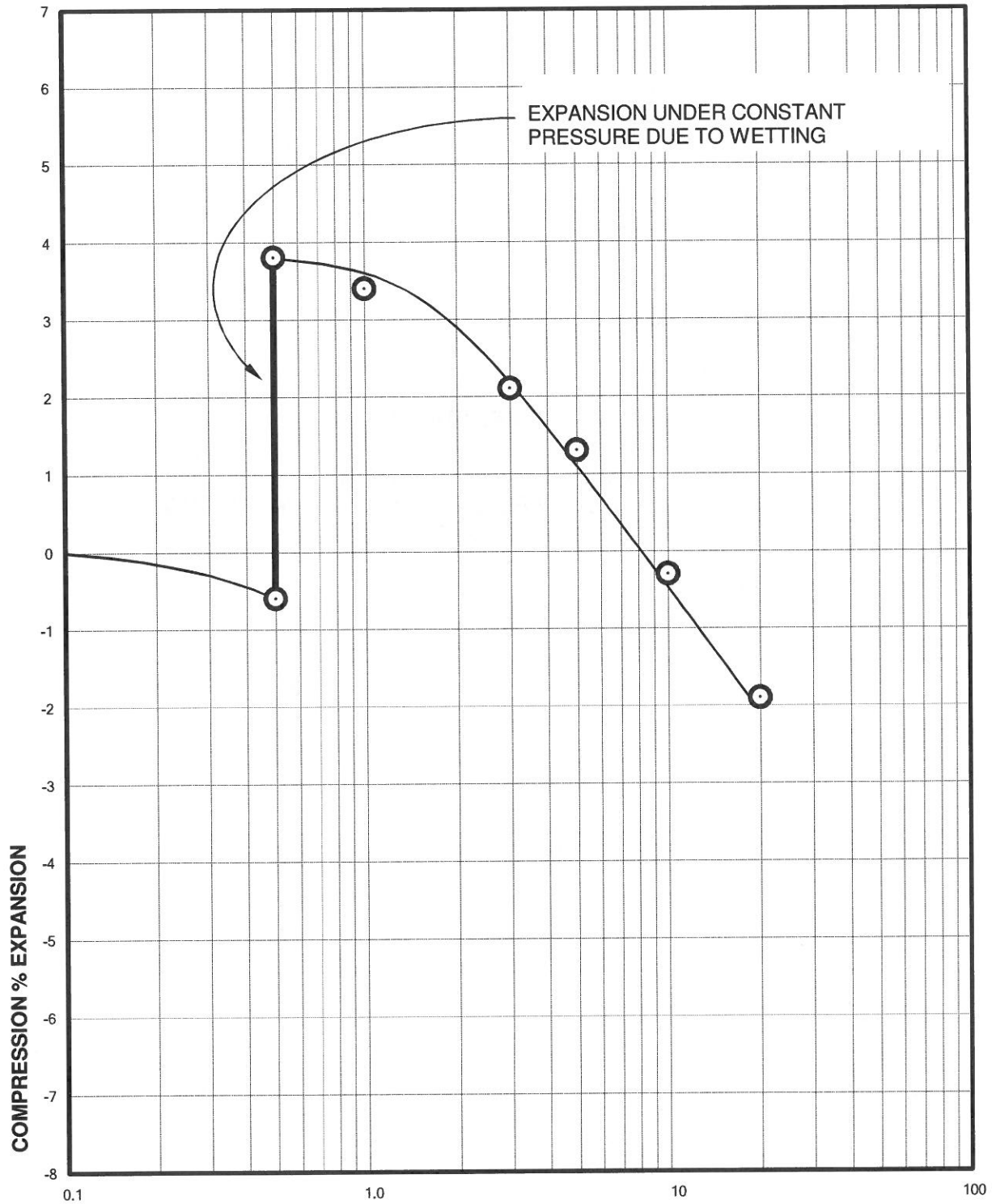


**Summary Logs of
Exploratory
Borings**



APPENDIX A

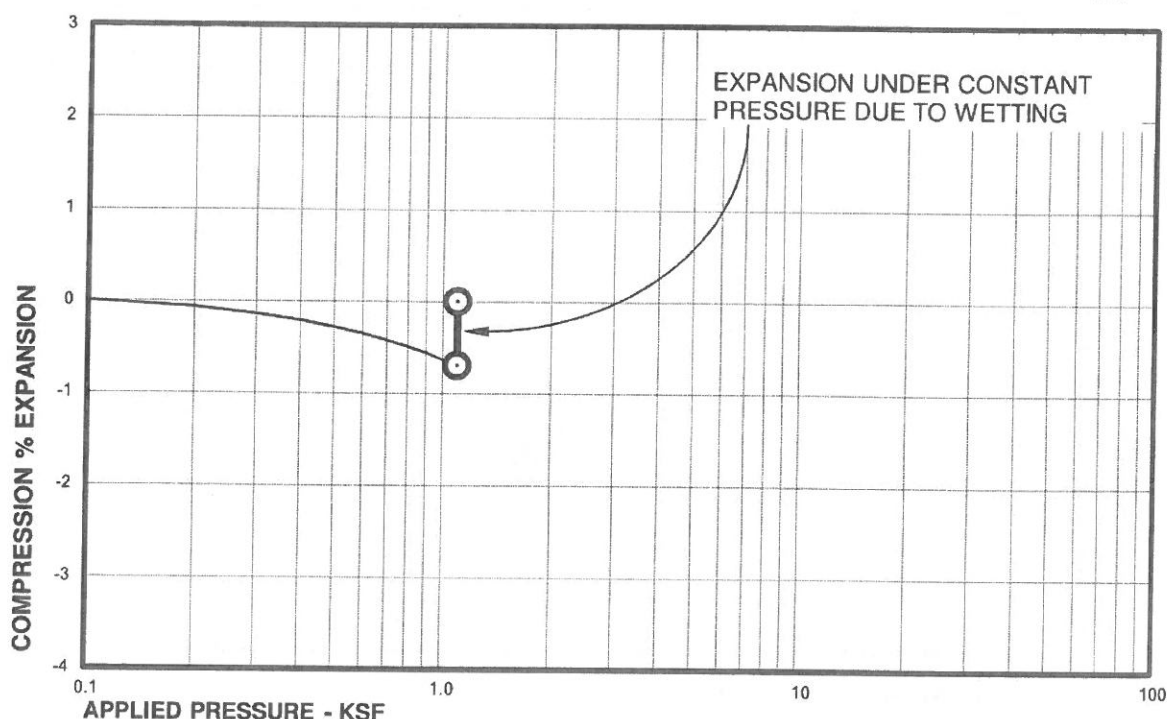
LABORATORY TEST RESULTS TABLE A-1 - SUMMARY OF LABORATORY TESTING



APPLIED PRESSURE - KSF
Sample of CLAYSTONE, SANDY
From TH-1 AT 4 FEET

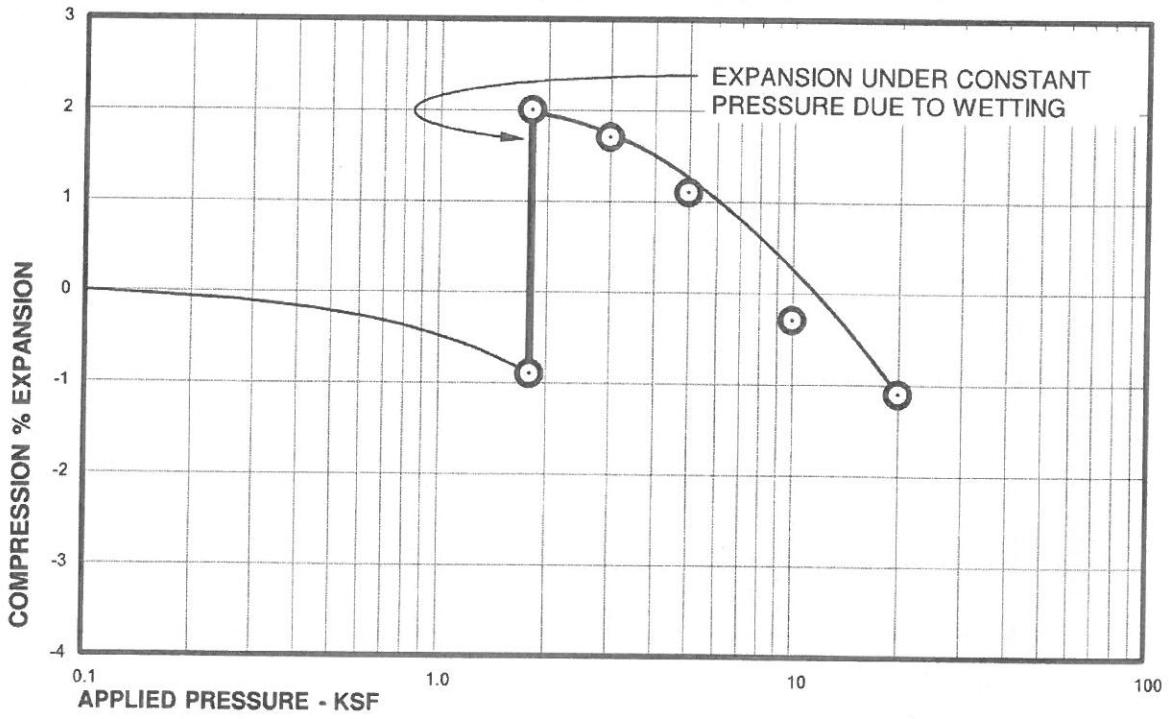
DRY UNIT WEIGHT= 120 PCF
MOISTURE CONTENT= 14.3 %

Swell Consolidation Test Results



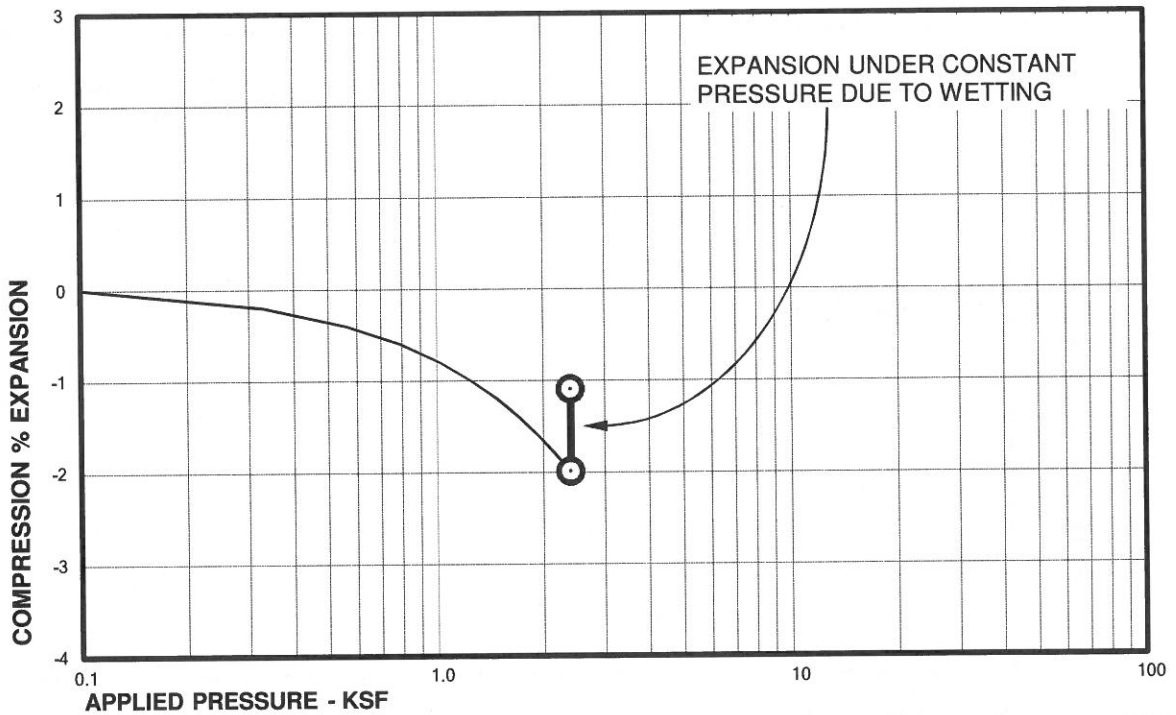
Sample of CLAYSTONE, SANDY
 From TH-1 AT 9 FEET

DRY UNIT WEIGHT= 116 PCF
 MOISTURE CONTENT= 14.0 %



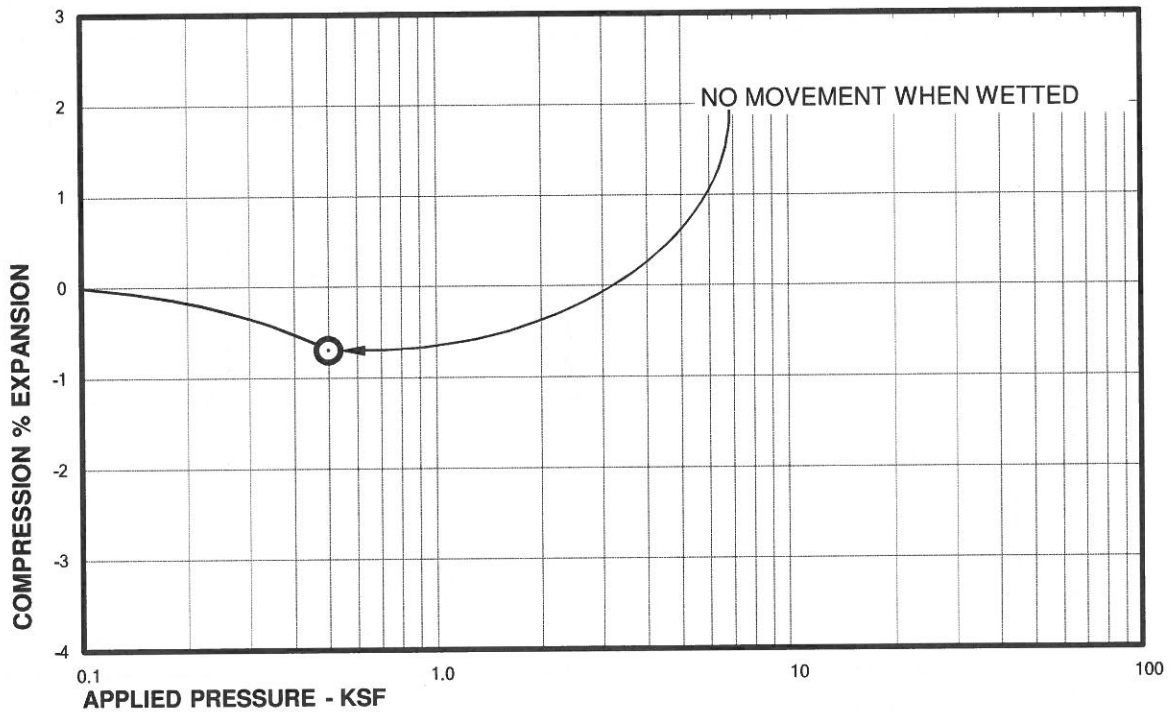
Sample of CLAYSTONE, SANDY
 From TH-1 AT 14 FEET

DRY UNIT WEIGHT= 116 PCF
 MOISTURE CONTENT= 14.1 %



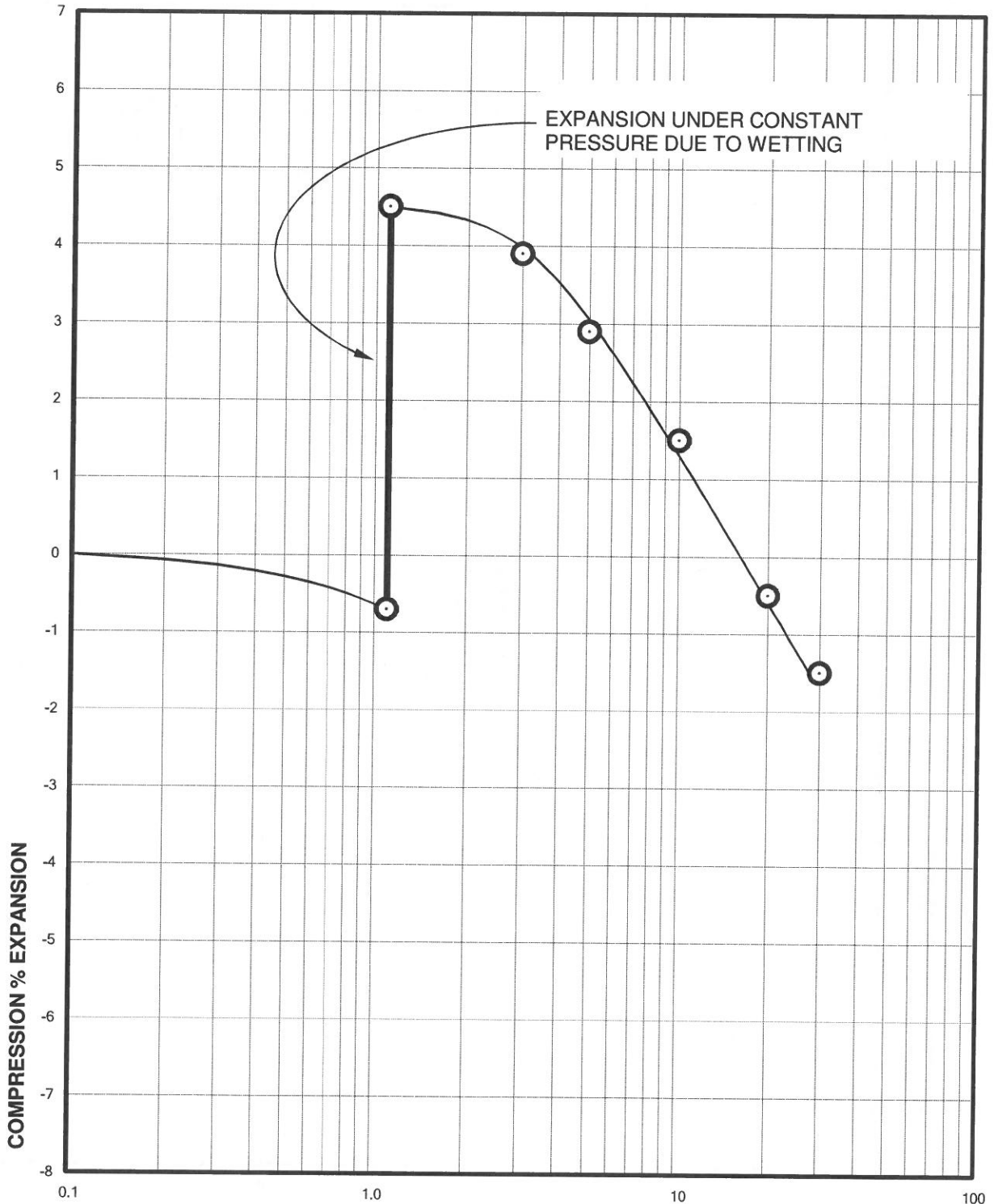
Sample of CLAYSTONE, SLIGHTLY SANDY
From TH-1 AT 19 FEET

DRY UNIT WEIGHT= 115 PCF
MOISTURE CONTENT= 14.9 %



Sample of WEATHERED CLAYSTONE
From TH-2 AT 4 FEET

DRY UNIT WEIGHT= 99 PCF
MOISTURE CONTENT= 12.0 %

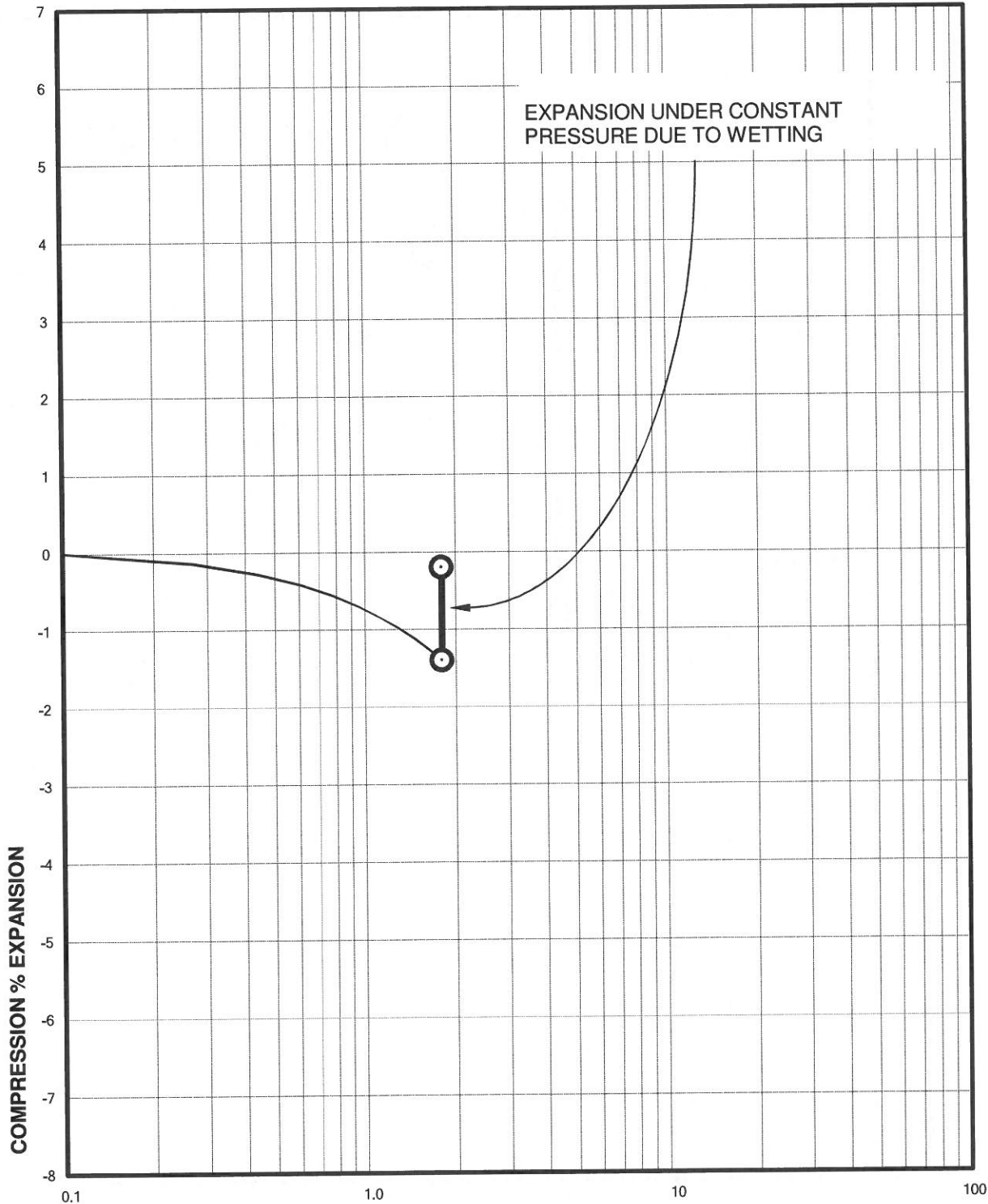


APPLIED PRESSURE - KSF
Sample of CLAYSTONE, SLIGHTLY SANDY
From TH-2 AT 9 FEET

DRY UNIT WEIGHT = 116 PCF
MOISTURE CONTENT = 15.2 %

Swell Consolidation Test Results

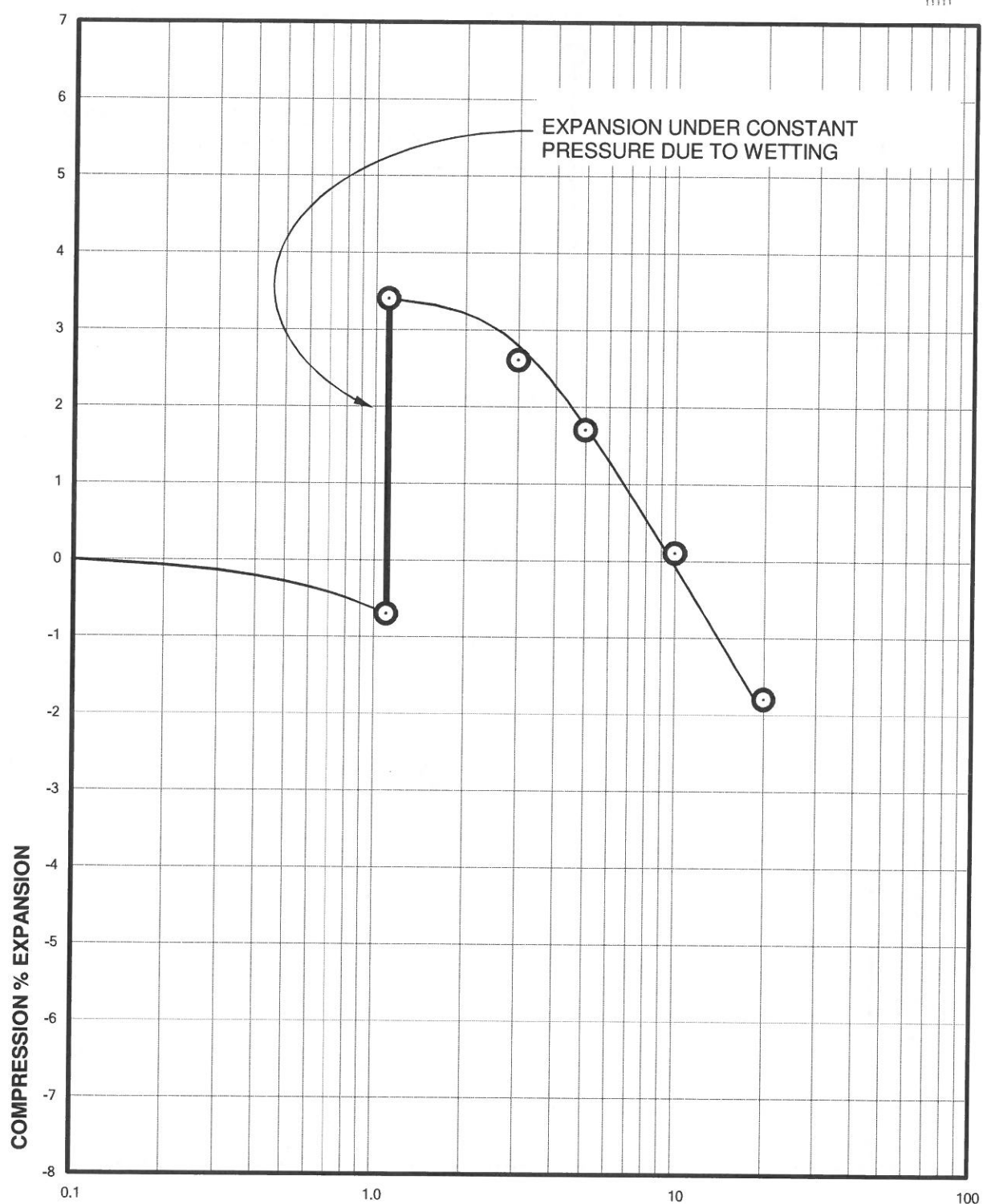
FIG. A-4



APPLIED PRESSURE - KSF
Sample of CLAYSTONE, SLIGHTLY SANDY
From TH-2 AT 14 FEET

DRY UNIT WEIGHT= 112 PCF
MOISTURE CONTENT= 14.3 %

Swell Consolidation Test Results

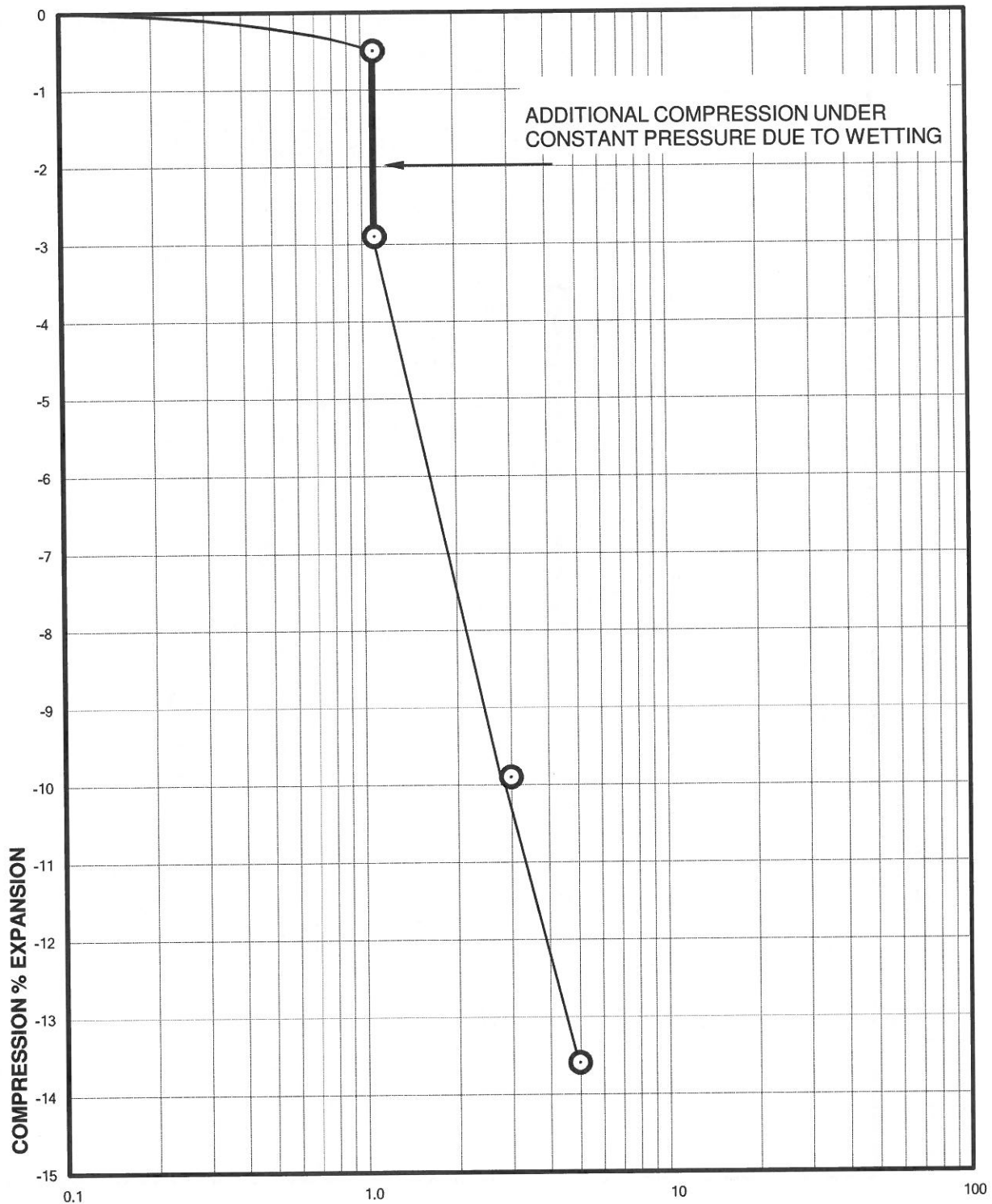


APPLIED PRESSURE - KSF
Sample of CLAYSTONE, SLIGHTLY SANDY
From TH-6 AT 9 FEET

DRY UNIT WEIGHT= 116 PCF
MOISTURE CONTENT= 12.4 %

Swell Consolidation Test Results

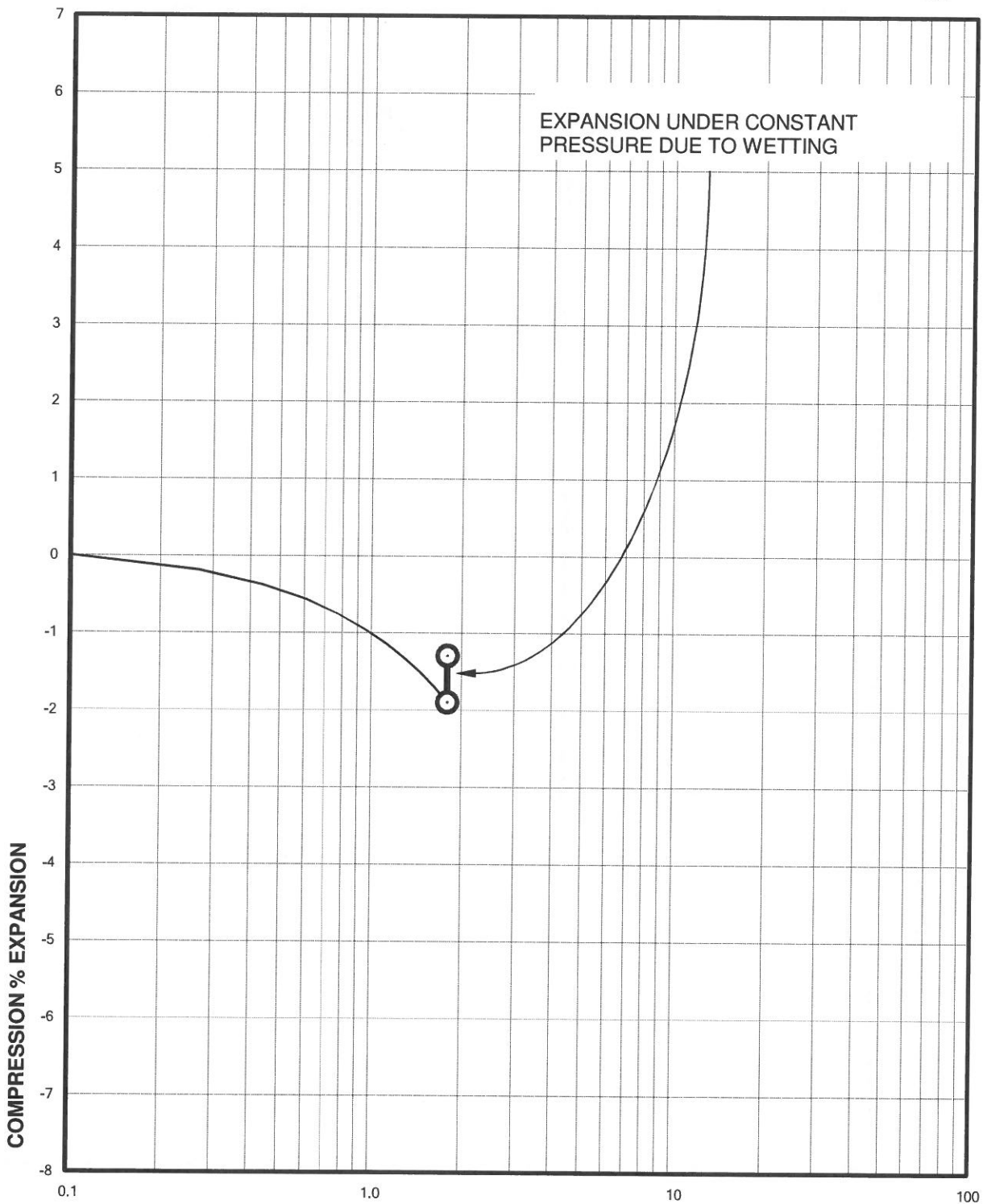
FIG. A-6



APPLIED PRESSURE - KSF
Sample of CLAY, SANDY (CL)
From TH-11 AT 9 FEET

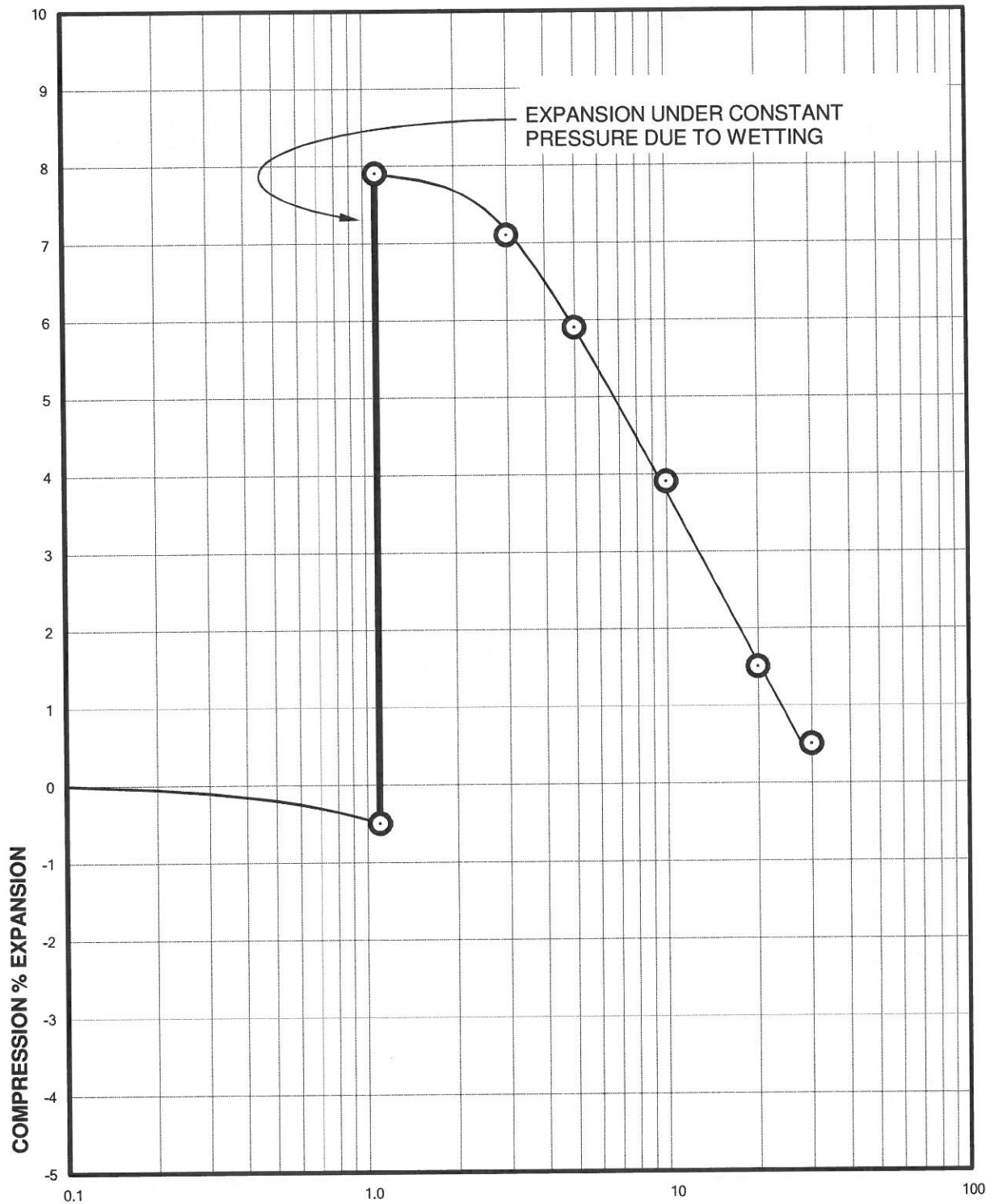
DRY UNIT WEIGHT = 89 PCF
MOISTURE CONTENT = 9.5 %

Swell Consolidation Test Results



APPLIED PRESSURE - KSF
Sample of CLAY, SLIGHTLY SANDY (CL)
From TH-12 AT 14 FEET

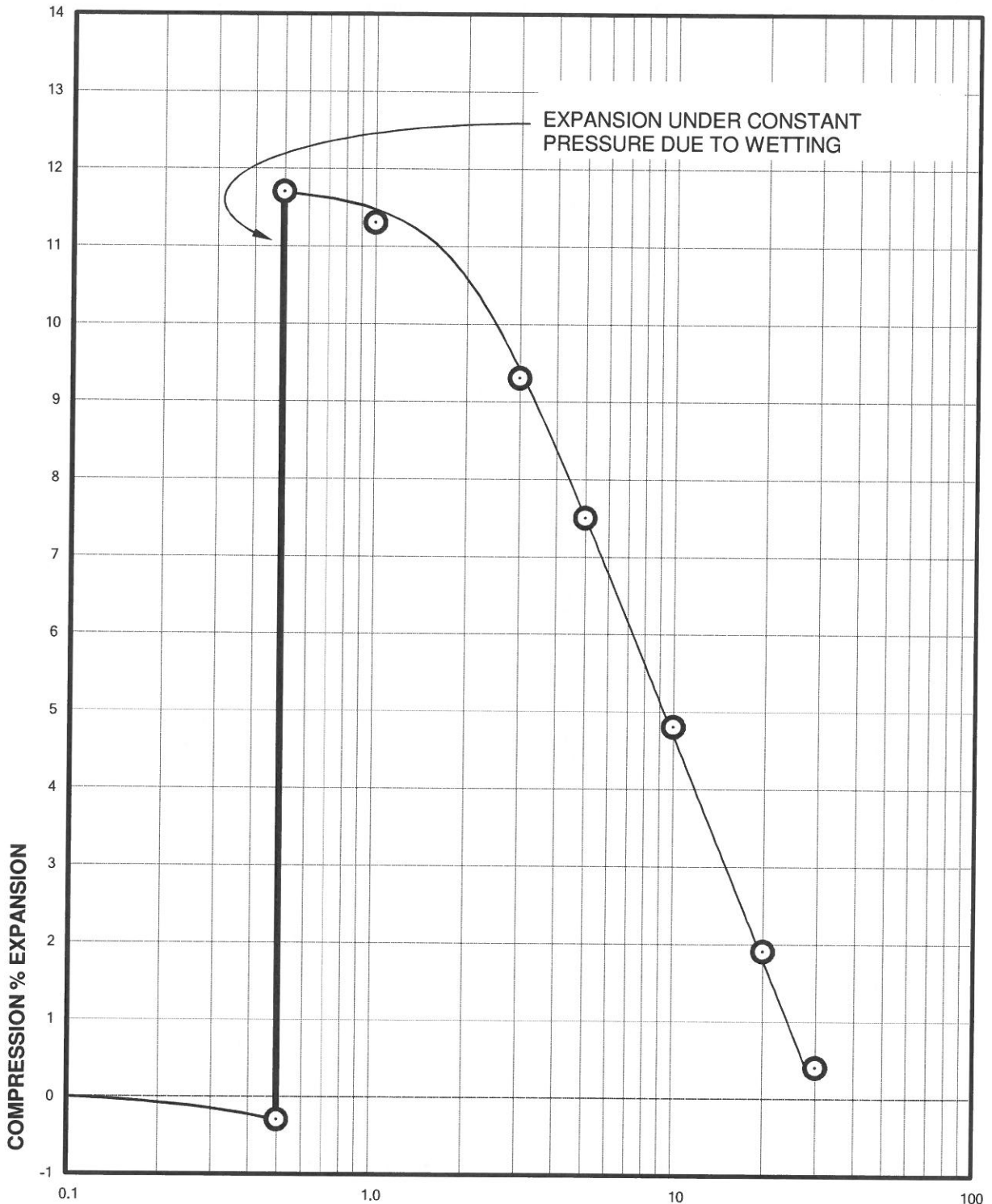
DRY UNIT WEIGHT= 108 PCF
MOISTURE CONTENT= 18.8 %



APPLIED PRESSURE - KSF
Sample of WEATHERED CLAYSTONE
From TH-13 AT 9 FEET

DRY UNIT WEIGHT = 121 PCF
MOISTURE CONTENT = 12.8 %

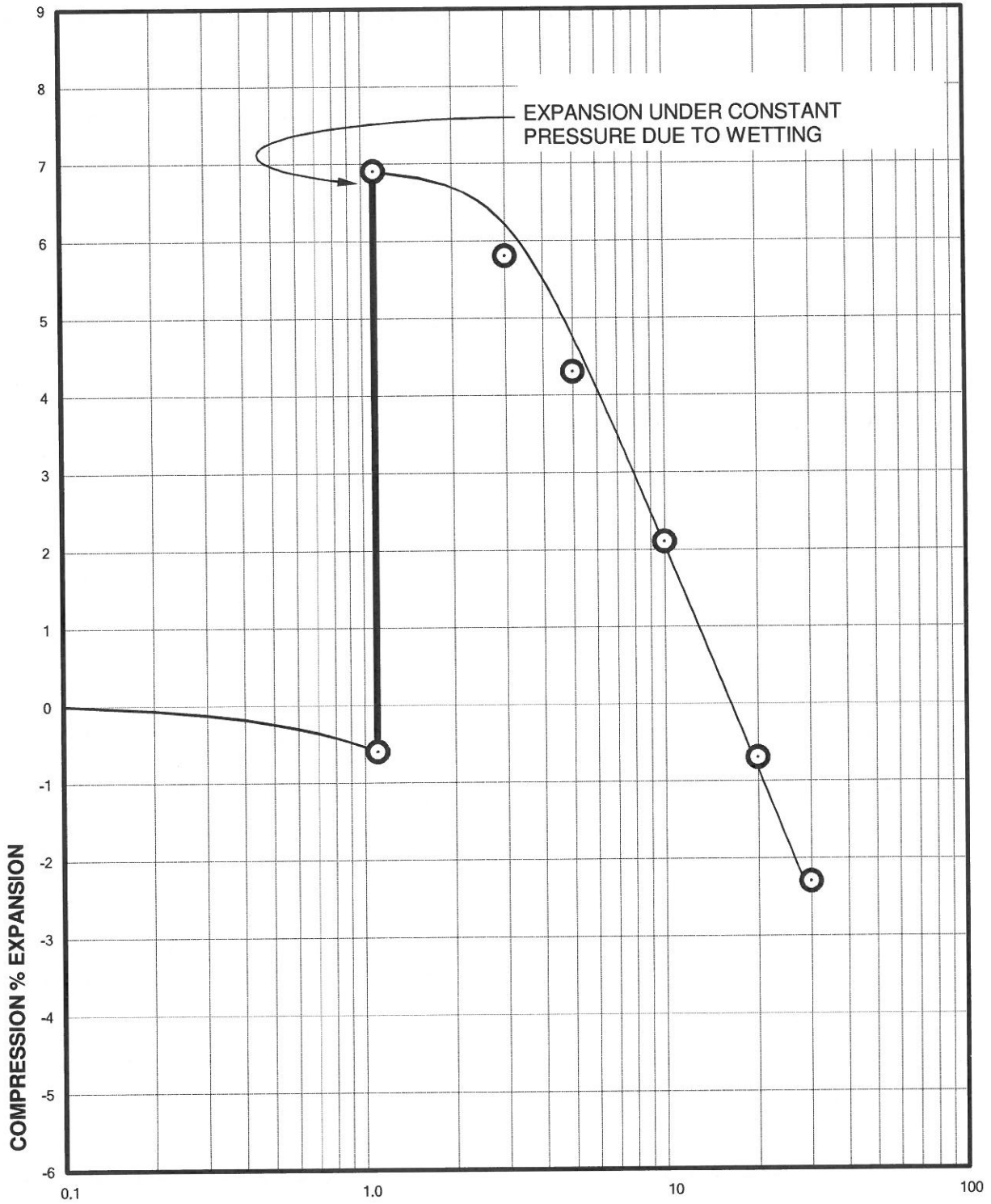
Swell Consolidation Test Results



APPLIED PRESSURE - KSF
Sample of CLAYSTONE, SLIGHTLY SANDY
From TH-14 AT 4 FEET

DRY UNIT WEIGHT = 122 PCF
MOISTURE CONTENT = 11.8 %

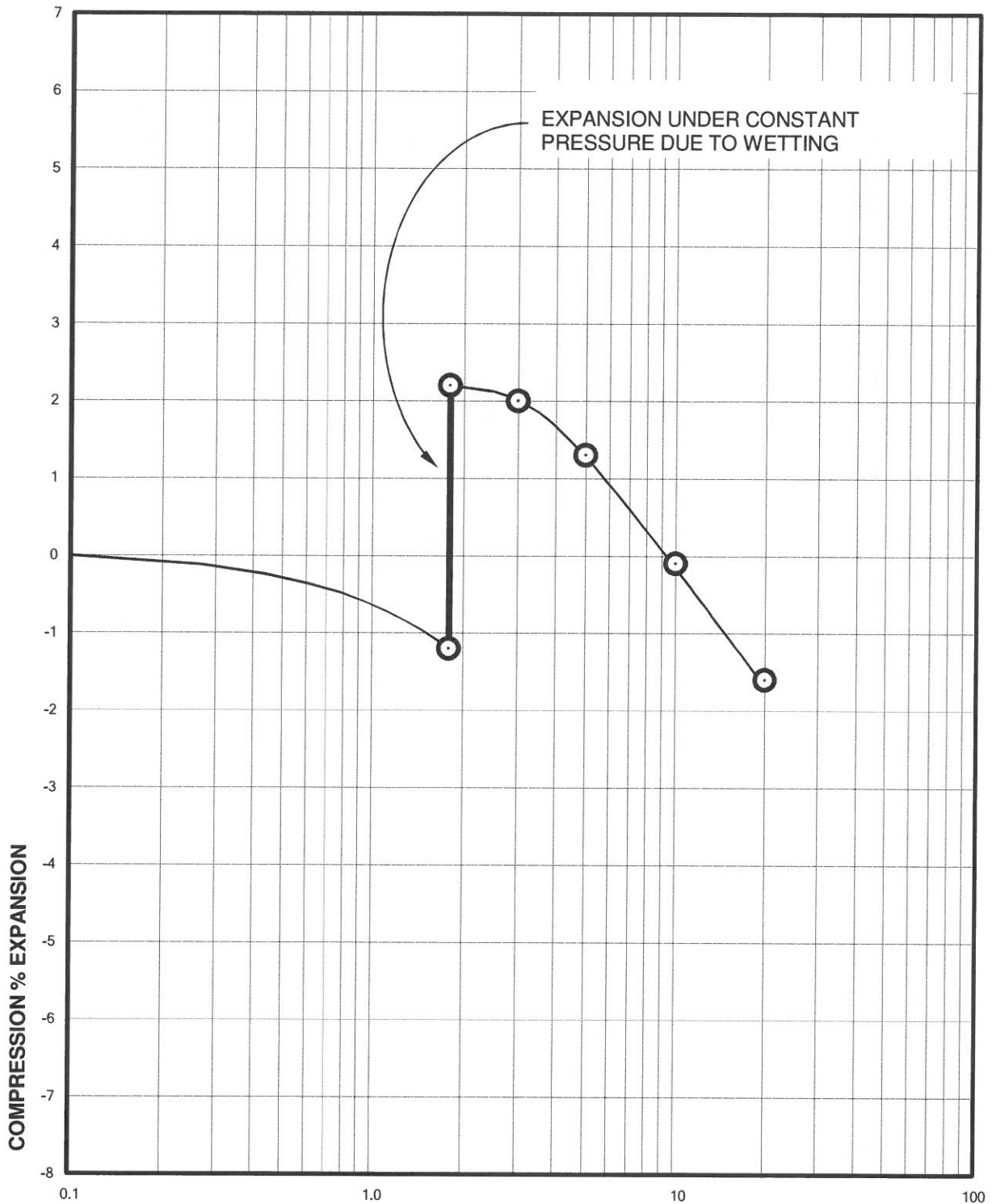
Swell Consolidation Test Results



APPLIED PRESSURE - KSF
Sample of CLAYSTONE, SANDY
From TH-14 AT 9 FEET

DRY UNIT WEIGHT= 119 PCF
MOISTURE CONTENT= 12.7 %

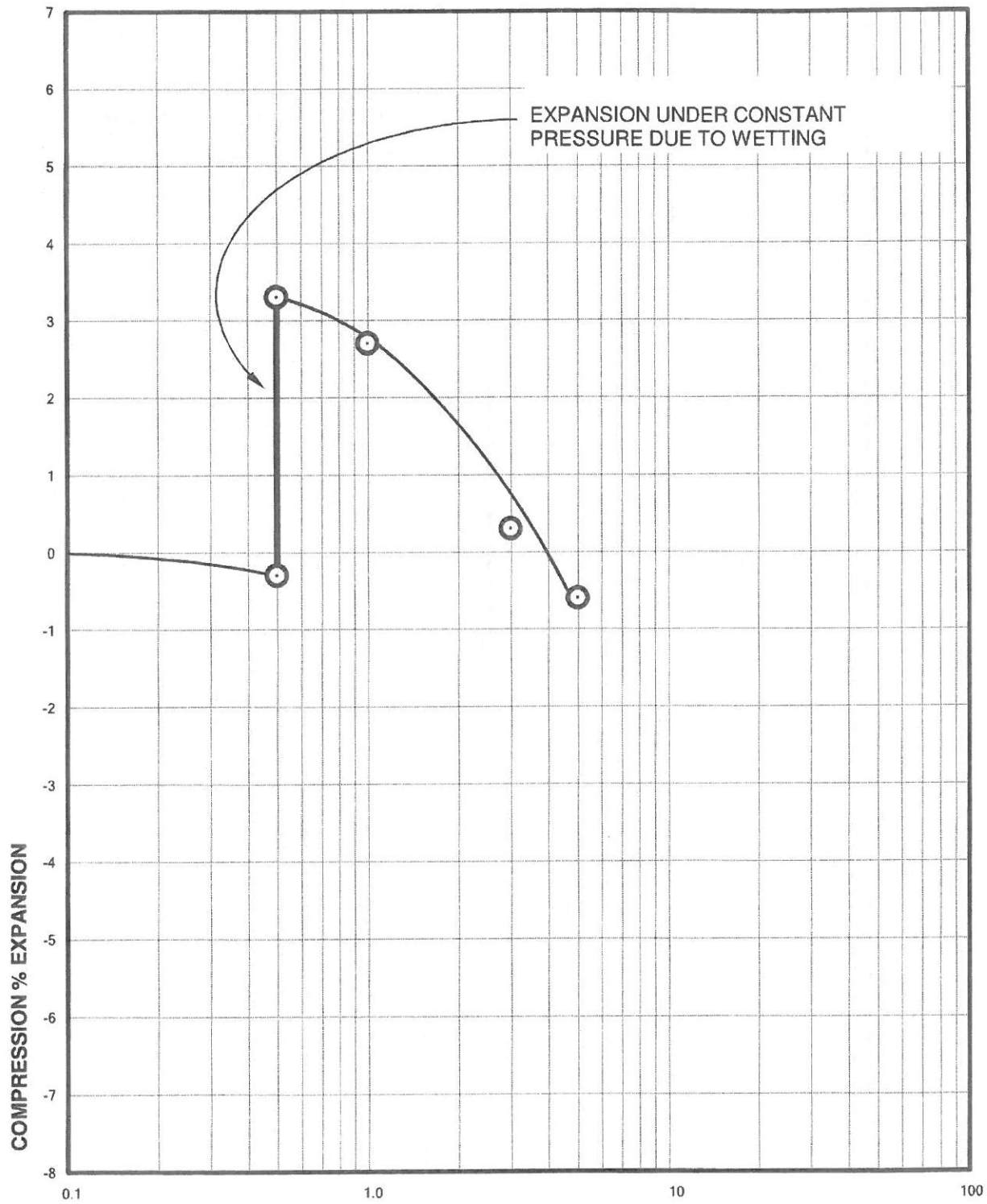
Swell Consolidation Test Results



APPLIED PRESSURE - KSF
Sample of CLAYSTONE, SLIGHTLY SANDY
From TH-14 AT 14 FEET

DRY UNIT WEIGHT = 128 PCF
MOISTURE CONTENT = 9.6 %

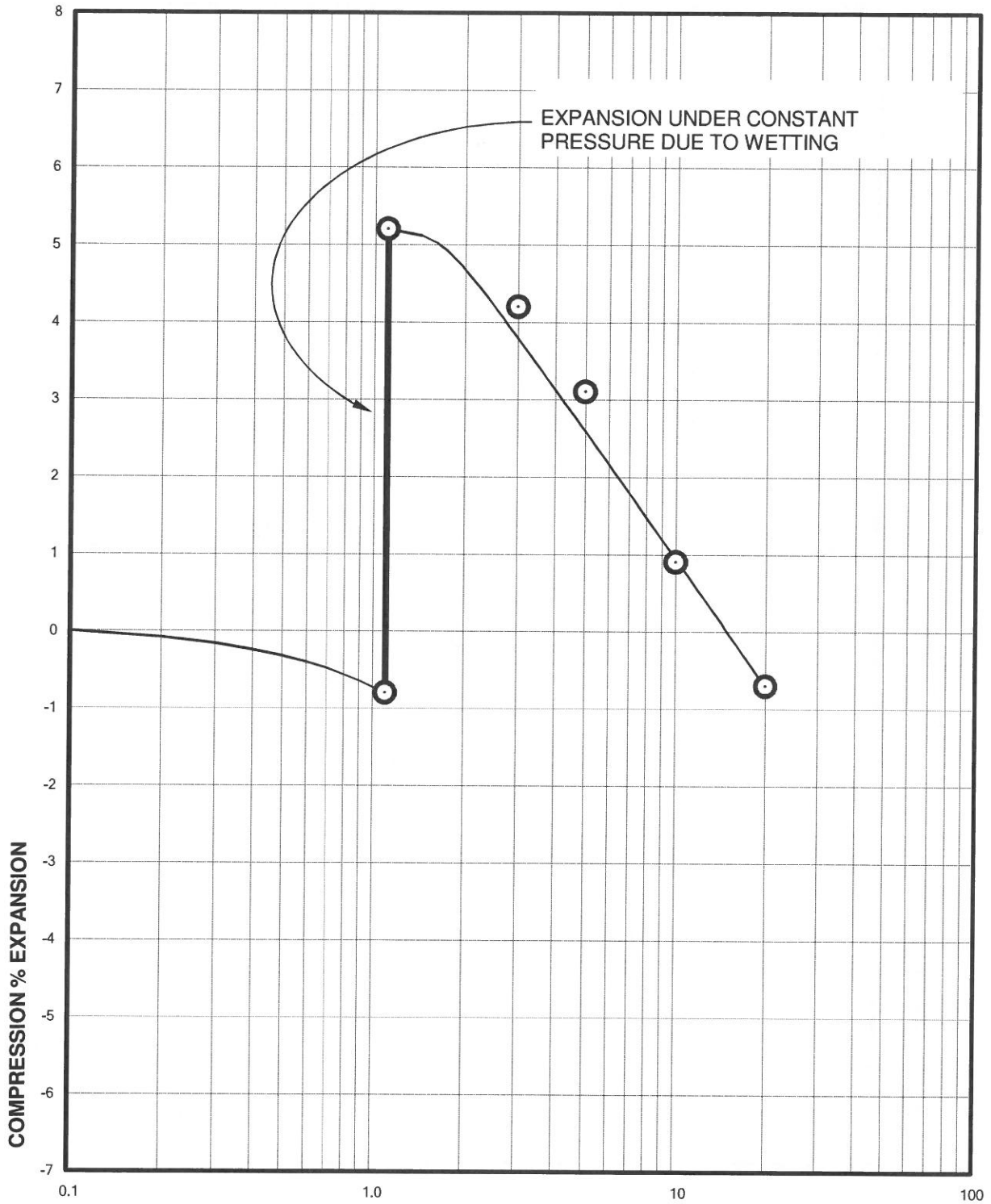
Swell Consolidation Test Results



APPLIED PRESSURE - KSF
Sample of CLAY, SANDY (CL)
From TH-15 AT 4 FEET

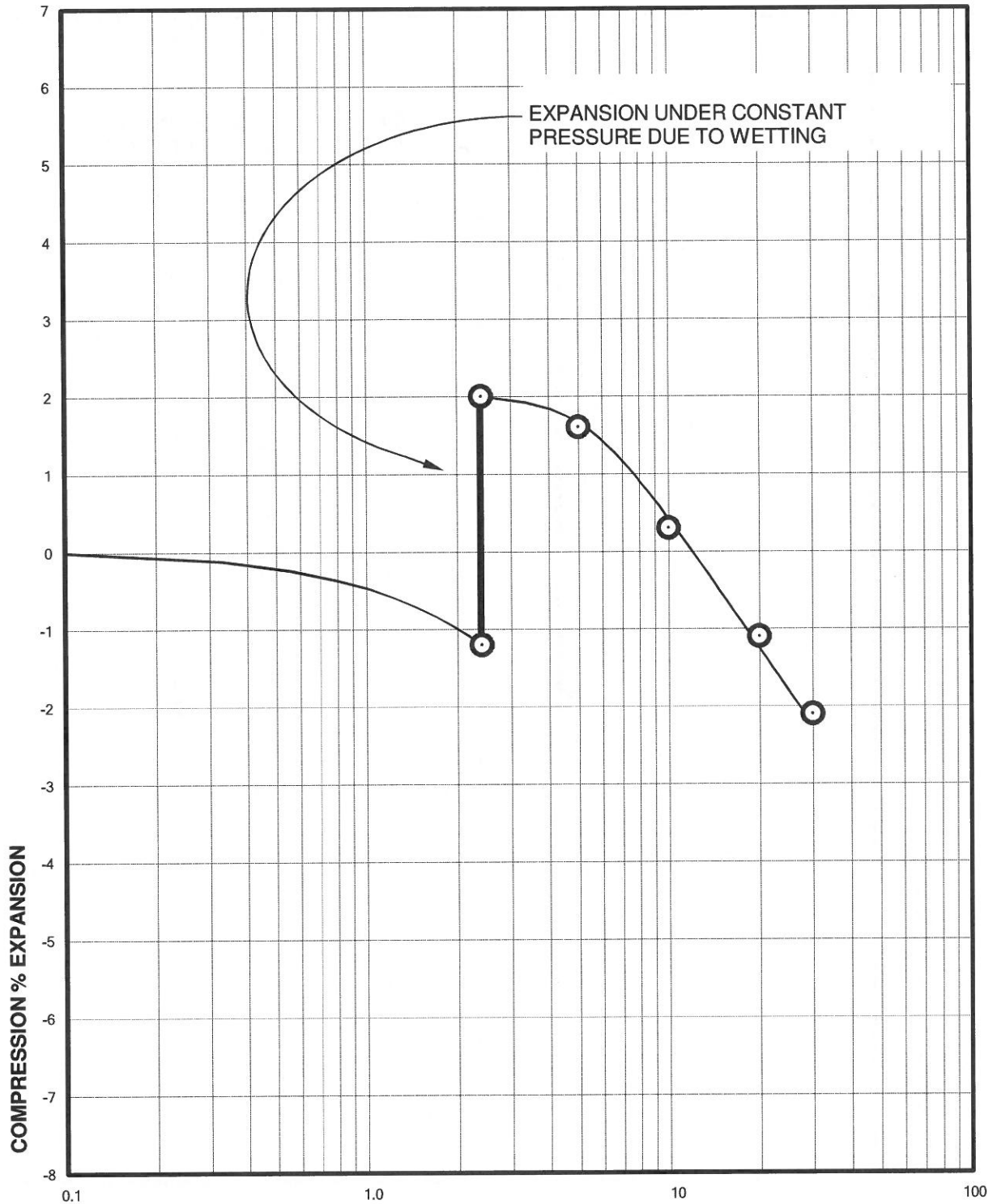
DRY UNIT WEIGHT = 103 PCF
MOISTURE CONTENT = 10.4 %

Swell Consolidation Test Results



APPLIED PRESSURE - KSF
Sample of CLAYSTONE, SLIGHTLY SANDY
From TH-15 AT 9 FEET

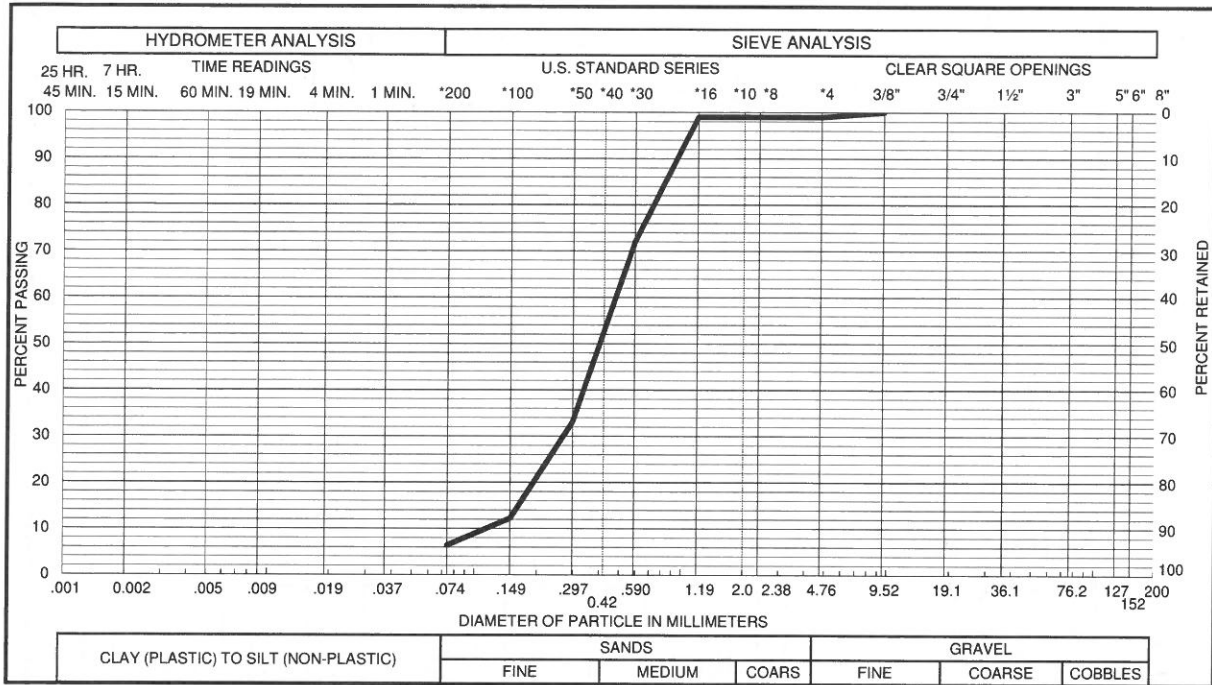
DRY UNIT WEIGHT = 121 PCF
MOISTURE CONTENT = 11.8 %



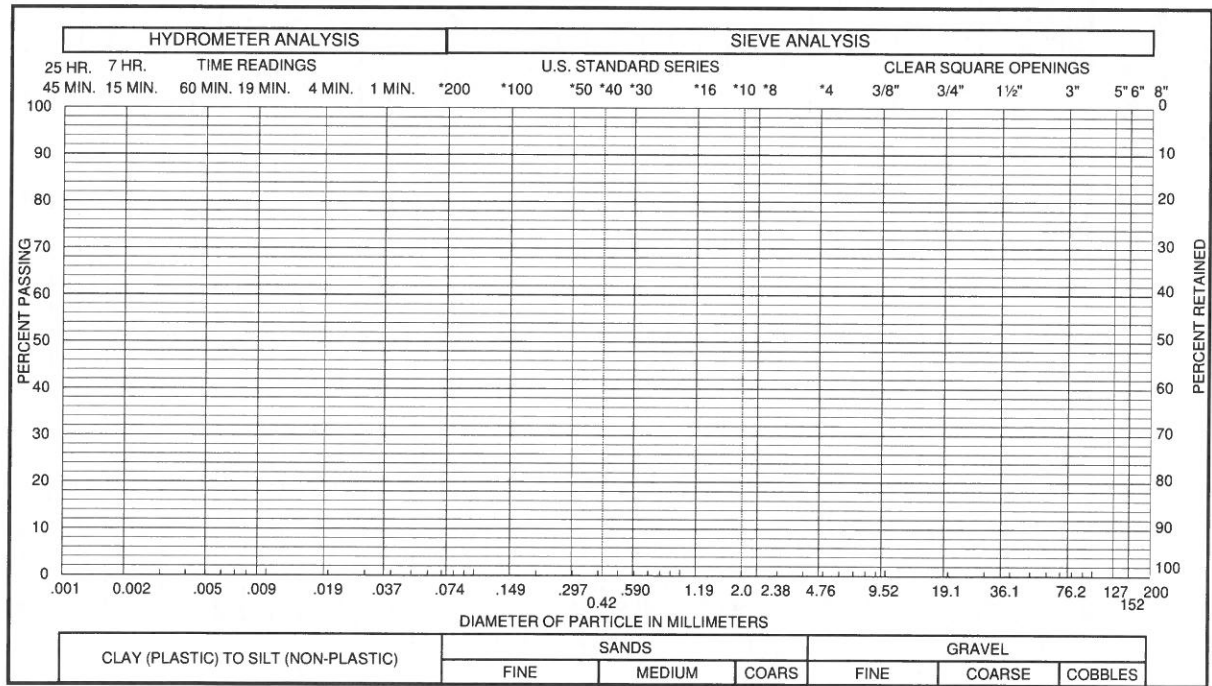
APPLIED PRESSURE - KSF
Sample of CLAYSTONE, SLIGHTLY SANDY
From TH-15 AT 19 FEET

DRY UNIT WEIGHT = 126 PCF
MOISTURE CONTENT = 13.2 %

Swell Consolidation Test Results



Sample of SAND, SLIGHTLY SILTY (SP-SM) GRAVEL 1 % SAND 93 %
 From TH - 9 AT 9 FEET SILT & CLAY 6 % LIQUID LIMIT %
 PLASTICITY INDEX %



Sample of _____ GRAVEL _____ % SAND _____ %
 From _____ SILT & CLAY _____ % LIQUID LIMIT _____ %
 PLASTICITY INDEX _____ %

Appendix D
Drawings

