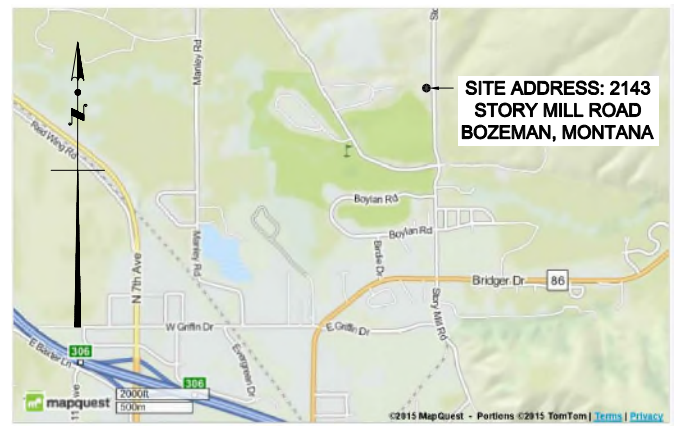
CONSTRUCTION PLANS
BOZEMAN LANDFILL
LFG/SVE/AI AND TREATMENT SYSTEM
JUNE 2015

BOZEMAN, MONTANA

INDEX OF DRAWINGS

VICINITY MAP
N.T.S.



LOCATION MAP
N.T.S.

RECOMMENDED FLARE MANUFACTURER REFERENCE DRAWINGS

SHEET 1 OF 1 - COVER SHEET
SHEET 1 OF 3 - ENCLOSED FLARE/THERMAL OXIDIZER P&ID
SHEET 2 OF 3 - ENCLOSED FLARE /THERMAL OXIDIZER P&ID
SHEET 3 OF 3 - ENCLOSED FLARE /THERMAL OXIDIZER P&ID
SHEET 1 OF 2 - CONTROL PANEL DETAILS
SHEET 1 OF 1 - 480 VOLT 3 PHASE ELEMENTARY
SHEET 1 OF 4 - 120VAC & INSTRUMENTATION ELEMENTARY
SHEET 2 OF 4 - 120VAC & INSTRUMENTATION ELEMENTARY
SHEET 3 OF 4 - 120VAC & INSTRUMENTATION ELEMENTARY
SHEET 4 OF 4 - 120VAC & INSTRUMENTATION ELEMENTARY
SHEET 1 OF 1 - FLARE STATION LAYOUT
SHEET 1 OF 1 - GAS HANDLING SKID TOP ASSEMBLY
SHEET 1 OF 2 - FLARE TOP ASSEMBLY
SHEET 2 OF 2 - FLARE ASSEMBLY DETAILS

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811 Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

CITY OF BOZEMAN 1883 GALLATIN CO. MONTANA

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL
LFG/SVE/AI AND TREATMENT SYSTEM
TITLE SHEET

DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 01-01-0123TTL	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 1 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		

I:\dwg\Bozeman\Construction Drawings\01-01-0123TTL.dwg 6/29/15 16:34:16 scott.angus

MISCELLANEOUS SYMBOLS

- I/P = CURRENT TO PNEUMATIC
- A/M = AUTO/MANUAL
- A/D = ANALOG/DIGITAL
- L/R = LOCAL/REMOTE
- HOA = HAND/OFF/AUTO
- S = SOLENOID VALVE
- I = INTERLOCK
- R = RESET FOR LATCH TYPE ACTUATOR
- AND = INTERLOCK IF ALL INPUTS EXIST
- OR = INTERLOCK IF ANY ONE OR MORE INPUTS EXIST
- 1 / 2 = DETAIL NUMBER; SHEET NUMBER DETAIL IS DRAWN ON

INSTRUMENT SYMBOLS

- = LOCALLY MOUNTED INSTRUMENT
- = PLC CONTROLLED DEVICE, CONTROL PANEL MOUNTED
- = CONTROL PANEL MOUNTED INSTRUMENT
- = LOCALLY PANEL MOUNTED UNIT
- = INSTRUMENT MOUNTED BEHIND BOARD
- = LOCAL BOARD MOUNTED INSTRUMENT
- = CONTROL PANEL MOUNTED DEVICE (STATUS OR ALARM)
- = PILOT LIGHT (R=RED; G=GREEN; A=AMBER; B=BLUE; W=WHITE; C=CLEAR; N=NEON)
- = REMOTE MONITORING (STATUS OR ALARM)
- = REMOTE CONTROL

LINE & SIGNAL SYMBOLS

- = PNEUMATIC TRANSMISSION, INSTRUMENT AIR SUPPLY AND/OR GAS SIGNAL, PIPE OR TUBING
- = ELECTRICAL TRANSMISSION (CONDUIT OR TECK CABLE)
- = SOFTWARE COMMUNICATION LINK
- = CONNECTION TO PROCESS, MECHANICAL LINK
- = CONDENSATE CONVEYANCE PIPING

INSTRUMENTATION DEVICES & ACCESSORIES

- = PITOT TUBE OR PITOT VENTURI TUBE
- = PISTON OPERATED VALVE WITH HANDWHEEL, SIDE-MOUNTED
- = SELF-CONTAINED PRESSURE CONTROL VALVE
- = HYDRAULIC OR PNEUMATIC (SPRING RETURN) PISTON-OPERATED VALVE
- = SOLENOID-OPERATED 2-WAY VALVE
- = SOLENOID-OPERATED 3-WAY VALVE
- = PRESSURE RELIEF VALVE
- = PISTON-OPERATED VALVE WITH OPEN AND CLOSED POSITION SWITCHES AND WITH HANDWHEEL, SIDE MOUNTED
- = CONTROL VALVE WITH I/P TRANSDUCER
- = BUTTERFLY VALVE, HAND OPERATED
- = BALL VALVE, HAND OPERATED
- = NEEDLE VALVE, HAND OPERATED
- = HAND VALVE, HAND OPERATED
- = 3-WAY HAND VALVE, HAND OPERATED
- = PRESSURE REGULATOR W/PRESSURE GAUGE
- = BUTTERFLY VALVE, AUTOMATED
- = GEAR OPERATOR
- = Y-STRAINER
- = PNEUMATIC POSITIONER
- = FLEX CONNECTOR
- = FLEX CONNECTOR WITH FLANGE CONNECTION
- = FLANGE CONNECTION
- = BLIND FLANGE
- = UNION
- = CAP
- = CONCENTRIC REDUCER
- = ECCENTRIC REDUCER
- = PLUG (SAMPLE PORT LOCATION)
- = MANUAL ACTUATOR/OVERRIDE
- = FILTER/REGULATOR ASSEMBLY (FR) FILTER/REGULATOR/LUBRICATOR (FRL)
- = SPRAY NOZZLE

WIRING SCHEMATIC SYMBOLS

- = CONTACT, N.O.
- = CONTACT, N.C.
- = TIMED CONTACT (N.O.T.C.)
- = TIMED CONTACT (N.C.T.O.)
- = TIMED CONTACT (N.O.T.O.)
- = TIMED CONTACT (N.C.T.C.)
- = COIL (RELAY, TIMER, ETC.)
- = LATCHING RELAY
- = PILOT LIGHT
- = PILOT LIGHT (PUSH TO TEST)
- = PILOT (DUAL INPUT)
- = SOLENOID VALVE COIL
- = BUZZER OR HORN
- = ELECTRONIC AUDIBLE DEVICE OR ELAPSED TIME METER
- = PUSHBUTTON, N.O.
- = PUSHBUTTON, N.C.
- = PUSHBUTTON, MUSHROOM HEAD
- = PUSH-PULL UNIT (MAINTAINED CONTACTS)
- = PUSHBUTTON (1=N.O.; 1=N.C.)
- = SELECTOR SWITCH (2-POSITION)
- = SELECTOR SWITCH (3-POSITION)
- = SELECTOR SWITCH (3-POSITION WITH CENTER POSITION CONTACT CLOSURE)
- = PRESSURE SWITCH, CLOSE ON INCREASE
- = PRESSURE SWITCH, CLOSE ON DECREASE
- = TEMPERATURE SWITCH, CLOSE ON INCREASE
- = TEMPERATURE SWITCH, CLOSE ON DECREASE
- = LEVEL SWITCH, CLOSE ON RISE
- = LEVEL SWITCH, CLOSE ON DROP
- = FLOW SWITCH, CLOSE ON FLOW
- = FLOW SWITCH, OPEN ON FLOW
- = LIMIT SWITCH, N.O.
- = LIMIT SWITCH, N.O. HELD CLOSED
- = LIMIT SWITCH, N.C. HELD OPEN
- = LIMIT SWITCH, N.C.
- = FUSE
- = GROUND CONNECTION
- = JUNCTION
- = CONTROL PANEL TERMINAL
- = REMOTE PANEL TERMINAL
- = DISCONNECTING (ISOLATING) TERMINAL
- = CONTROL TRANSFORMER
- = IGNITER
- = U.V. FLAME SCANNER
- = THERMOCOUPLE
- = WIRES CROSSING, NO CONNECTION
- = WIRES CONNECTING
- = INTERNAL WIRING
- = FIELD WIRING
- = SHIELDED WIRES (INDICATES GROUND WHEN REQUIRED)
- = LOCAL HAND/OFF SWITCH

SINGLE LINE DIAGRAMS

- = SWITCH
- = CIRCUIT BREAKER
- = EXTERNALLY OPERABLE CIRCUIT BREAKER
- = TRANSFORMER
- = CONTACTOR
- = MOTOR STARTER
- = FUSE
- = VARIABLE FREQUENCY DRIVE (VFD)
- = MOTOR

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811 Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL

LFG/SVE/AI AND TREATMENT SYSTEM

PIPING AND WIRING SYMBOLS

DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 02_60-0007GSA	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 2 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		

I:\dwg\Bozeman\Construction Drawings\02_60-0007GSA.dwg 5/27/15 13:50:25 scott.angus

MISCELLANEOUS ABBREVIATIONS

A	=	ACTUATOR or AIR LINE or AMP
AC	=	ALTERNATING CURRENT or AIR CONDITIONER
ACB	=	AIR CIRCUIT BREAKER
A/C	=	AIR CONDITIONER
ACFM	=	ACTUAL CUBIC FEET PER MINUTE
ADS	=	AUTO DIALER SYSTEM
AEMS	=	AUTOMATED EMISSION MONITORING SYSTEM
AF	=	AMPERE FRAME SIZE (CIRCUIT BREAKER)
AFF	=	ABOVE FINISH FLOOR
AI	=	AIR INJECTION OR ANALOG INPUT
AIO	=	ANALOG INPUT OUTPUT
AOUT	=	ANALOG OUTPUT
AL	=	ALUMINUM
AMP	=	AMPERES, AMPERAGE
AT	=	AMPERE TRIP
ATS	=	AUTOMATIC TRANSFER SWITCH
AUTO	=	AUTOMATIC
AWG	=	AMERICAN WIRE GAUGE
B or BL	=	BLOWER
BALL	=	BURNER ALARM LOW LOW
BATT	=	BATTERY
BC	=	BARE COPPER
BE	=	BURNER ELEMENT (UV SCANNER)
BG	=	BURNER GLASS
BI	=	BLACK IRON
BKR or BRKR	=	BREAKER
BOM	=	BILL OF MATERIAL
BOS	=	BOTTOM OF SLAB ELEVATION
BP	=	BOTTOM OF PIPE
BPS	=	BUILDING PROTECTION SYSTEM
BS	=	BURNER SWITCH (FLAME SAFEGUARD)
BSTPT	=	BRITISH STANDARD TAPER PIPE THREAD
BTM	=	BOTTOM OF REFUSE
BTU	=	BRITISH THERMAL UNIT
BUS	=	BINARY UNIT SYSTEM
C	=	CONDUIT or CONDENSATE LINE or COIL or CONTRACTOR
CAH	=	CURRENT ALARM HIGH
CAL	=	CURRENT ALARM LOW
CAP	=	STUB-UP TOP CAP ELEVATION
CB	=	CIRCUIT BREAKER
CBL	=	CABLE
CC	=	CENTER TO CENTER
CGH	=	COMBUSTIBLE GAS HIGH
CGHH	=	COMBUSTIBLE GAS HIGH HIGH
CGI	=	COMBUSTIBLE GAS INDICATOR
CGSM	=	COMBUSTIBLE GAS SENSOR MODULE
CGT	=	COMBUSTIBLE GAS TRANSMITTER
CH	=	CHANNEL
CHGR	=	CHARGER
CHR	=	CHART RECORDER
CI	=	CURRENT INDICATOR
CIR	=	CIRCUIT
CMB	=	CRUSHED MISCELLANEOUS BASE
CMU	=	CONCRETE MASONRY UNIT
CNT	=	COUNTER
CNTRL	=	CONTROL
CO	=	COMPRESSOR or CONDUIT ONLY
COMM	=	COMMUNICATION
CMP or COMP	=	COMPRESSOR
CONN	=	CONNECTION
CP	=	CONTROL PANEL
CPT	=	CONTROL POWER TRANSFORMER
CPVC	=	CHLORINATED POLYVINYL CHLORIDE
CR	=	CONTROL RELAY
CS	=	CARBON STEEL
CSP	=	CORRUGATED STEEL PIPE
CSL	=	CURRENT SWITCH LOW
CT	=	CURRENT TRANSFORMER
CU	=	COPPER
CV	=	CONTROL VALVE (MODULATING) (CHECK VALVE)
D	=	DRYER OR DISTANCE
DC	=	DIRECT CURRENT
DI	=	DIGITAL INPUT
DIA	=	DIAMETER
DIST or DISTR	=	DISTRIBUTION
DL	=	DAYLIGHT
DP	=	DELTA or DIFFERENTIAL PRESSURE or DISTRIBUTION PANEL or DOUBLE POLE
DPA	=	DISTRIBUTION PANEL A
DPDT	=	DOUBLE POLE DOUBLE THROW
DPI	=	DIFFERENTIAL PRESSURE INDICATOR
DPS	=	DIFFERENTIAL PRESSURE SWITCH
DS	=	DISCONNECT SWITCH
DPST	=	DOUBLE POLE SINGLE THROW
DT	=	DOUBLE THROW
DV	=	DRAIN VALVE
DWG	=	DRAWING
E	=	VOLTAGE or ELECTRICAL
EI	=	VOLTAGE INDICATOR
E/E	=	VOLTAGE TRANSFORMER
EDP	=	ELECTRICAL DISTRIBUTION PANEL
ELEV	=	ELEVATION
EG	=	ELECTRICAL GENERATOR
EJ	=	EXPANSION JOINT
EMER	=	EMERGENCY
EMT	=	ELECTRICAL METALLIC TUBING
ENCL	=	ENCLOSURE, ENCLOSED
EQPT	=	EQUIPMENT
ES	=	EMERGENCY STOP
ETM	=	ELAPSED TIME METER
EXH	=	EXHAUST
EXIST	=	EXISTING
EXO	=	EXTERNALLY OPERATED DISCONNECT SWITCH
EXP	=	EXPLOSION PROOF
F	=	FUSE
FI	=	FLOW INDICATOR
FA	=	FLAME ARRESTER, FIRE ALARM
FAH	=	FLOW ALARM HIGH
FAHH	=	FLOW ALARM HIGH HIGH
FAL	=	FLOW ALARM LOW
FALL	=	FLOW ALARM LOW LOW
FAU	=	FIELD ANALYTICAL UNIT
FBO	=	FURNISHED BY OTHERS
FC	=	FLOW CONTROLLER or FAIL CLOSE
F.C.	=	FAIL CLOSE
FCV	=	FLOW CONTROL VALVE
FD	=	FUSED DISCONNECT
FDR	=	FEEDER
FE	=	FLOW ELEMENT (FLOW METER)
FF	=	FINISH FLOOR ELEVATION
FFA	=	FLAME FAILURE ALARM
FG	=	FINISH GRADE ELEVATION
FI	=	FLOW INDICATOR
FIC	=	FLOW INDICATOR CONTROLLER
FIPT	=	FEMALE IRON PIPE THREAD
FIR	=	FLOW INDICATING RECORDER
FIT	=	FLOW INDICATING TRANSMITTER
FL	=	FLOWLINE
FLA	=	FULL LOAD AMPS
FLEX or FX	=	FLEXIBLE
FLG	=	FLANGE
FLR	=	FLARE
FLT	=	FILTER
FLTP	=	PORT FILTER
FNPT	=	FEMALE NATIONAL PIPE THREAD
F.O.	=	FAIL OPEN
FPT	=	FEMALE NATIONAL PIPE THREAD
FQI	=	FLOW TOTALIZER INDICATOR
FR	=	FLOW RECORDER
FRG	=	FILTER REGULATOR
FRL	=	FILTER/REGULATOR/LUBRICATOR
FRP	=	FIBERGLASS REINFORCED PLASTIC
FS	=	FLOW SWITCH or FINISH SURFACE or FAILSAFE
FSH	=	FLOW SWITCH HIGH
FSL	=	FLOW SWITCH LOW
FSS	=	FIRE SUPPRESSION SYSTEM
FSV	=	FLOW SAFETY VALVE (CHECK VALVE)
FT	=	FUSE HOLDER
FU	=	FUSE
FUH	=	FLOW TRANSMITTER
FUT	=	FUTURE
FV	=	FLOW VALVE
FW	=	FIRE WATER
FX	=	FLEX
G	=	GROUND or GENERATOR or NATURAL GAS LINE
GAC	=	GRANULAR ACTIVATED CARBON
GAL	=	GALLON(S)
GALV	=	GALVANIZED
GB	=	GRADE BREAK
GEN	=	GENERATOR
GF	=	GROUND FAULT
GFI	=	GROUND FAULT INTERRUPTER
GM	=	GAS MONITOR
GND or GRND	=	GROUND
GR	=	GRADE ELEVATION
GW	=	GROUND WATER ELEVATION
GWT	=	GROUND WATER TREATMENT
GWTP	=	GROUND WATER TREATMENT PLANT
H	=	HIGH or HEIGHT
HC	=	HORIZONTAL GAS EXTRACTION COLLECTOR
HD	=	HEAVY DUTY
HDPE	=	HIGH DENSITY POLYETHYLENE
HDR	=	GAS COLLECTION HEADER ELEVATION
HIM or HMI	=	HUMAN INTERFACE MODULE
HP	=	HORSEPOWER OR PIPE HIGH POINT ELEVATION
HOA	=	HAND-OFF-AUTO
HS	=	HAND SWITCH
HT	=	HEAT TRACE
HTR	=	HEATER
HV	=	HAND VALVE
HVP	=	HAND VALVE PORT
HZ	=	HERTZ
I	=	CURRENT
II	=	CURRENT INDICATOR
I/I	=	CURRENT TRANSFORMER
IAH	=	CURRENT ALARM HIGH
IAHH	=	CURRENT ALARM HIGH HIGH
IAL	=	CURRENT ALARM LOW
IALL	=	CURRENT ALARM LOW LOW
IAS	=	INSTRUMENT AIR SUPPLY
IG or IGN	=	IGNITER
IIR	=	CURRENT INDICATING RECORDER
INST	=	INSTANTANEOUS
INSTR	=	INSTRUMENT
INV	=	INVERT OF PIPE ELEVATION
ISC	=	SHORT CIRCUIT CURRENT
IT	=	CURRENT TRANSMITTER
ITC	=	INDUSTRIAL TECHNICAL CORPORATION
JB	=	JUNCTION BOX
KA	=	KILO AMPERES
KCMIL	=	THOUSAND CIRCULAR MIL (WIRE SIZE)
KI	=	TIME INDICATOR
KMN	=	POTASSIUM PERMANGANATE
KO	=	KNOCK-OUT
KV	=	KILOVOLTS
KVA	=	KILOVOLT AMPERES
KW	=	KILOWATTS
LI	=	LEVEL INDICATOR
LAH	=	LEVEL ALARM HIGH
LAHH	=	LEVEL ALARM HIGH HIGH
LAL	=	LEVEL ALARM LOW
LALL	=	LEVEL ALARM LOW LOW
LAT	=	LATERAL PIPE ELEVATION
LB	=	CONDUIT FITTING (ELECTRICAL ELBOW BACK ACCESS)
LBD	=	LARGE LB CONDUIT FITTING
LC	=	LEVEL CONTROLLER
LCH	=	LEVEL CONTROLLER HIGH
LCL	=	LEVEL CONTROLLER LOW
LCP	=	LOCAL CONTROL PANEL
LCR	=	LATCHING CONTROL RELAY
LE	=	LEVEL ELEMENT
LEL	=	LOWER EXPLOSIVE LIMIT
LFG	=	LANDFILL GAS
LG	=	LEVEL GAGE
LMP	=	LAMP
LO	=	LOW or LUBE OIL
LOC	=	LANDFILL OPERATIONS CENTER or LOCAL
LOS	=	LOCK-OUT STOP or LOCK-OUT SWITCH
LP	=	LIGHTING PANEL or PIPE LOW POINT ELEVATION
LPA	=	LIGHTING PANEL "A"
LS	=	LEVEL SWITCH
LSH	=	LEVEL SWITCH HIGH
LSHH	=	LEVEL SWITCH HIGH HIGH
LSL	=	LEVEL SWITCH LOW
LSLL	=	LEVEL SWITCH LOW LOW
LT	=	LEVEL TRANSMITTER or LIGHT(S)
LTS	=	LIGHTS
LTG	=	LIGHTING
LUB	=	LUBRICATOR
M	=	MOTOR
MA	=	MILLIAMPS OR MECHANICAL ACTUATOR
M.A.	=	METHANE ANALYZER
MAL	=	METHANE ALARM LOW
MALL	=	METHANE ALARM LOW LOW
MAG	=	MAGNETIC
MAN	=	MANWAY
MAX	=	MAXIMUM
MCC	=	MOTOR CONTROL CENTER
MCM	=	THOUSAND CIRCULAR MILS
MCP	=	MAIN CONTROL PANEL or MOTOR CIRCUIT PROTECTION
MDP	=	MAIN DISTRUBUTION PANEL
MH	=	MANHOLE
MI	=	METHANE INDICATOR
MIN	=	MINIMUM
MIR	=	METHANE INDICATING RECORDER
MISC	=	MISCELLANEOUS
MIT	=	METHANE INDICATOR TRANSMITTER
MMS	=	MANUAL MOTOR STARTER
MNFLD	=	MANIFOLD
MNPT	=	MALE NATIONAL PIPE THREAD
M.O.	=	MOTOR OPERATED
MOD	=	MODEM or MODULATING or MODULATION
MOT	=	MOTOR
MOV	=	MOTOR OPERATED VALVE
MS	=	MOTOR STARTER
MT	=	MOUNT
MTD	=	MOUNTED
MTR	=	MOTOR
M.W.	=	MANWAY
NA	=	NON-AUTOMATIC or NOT APPLICABLE
N/A	=	NOT APPLICABLE
NBK	=	NEUTRAL BLOCK
N.C.	=	NORMALLY CLOSED
N.C.T.C.	=	NORMALLY CLOSED TIMED TO CLOSE
N.C.T.O.	=	NORMALLY CLOSED TIMED TO OPEN
NEC	=	NATIONAL ELECTRICAL CODE
NG	=	NATURAL GAS
NIC	=	NOT IN CONTRACT
N.O.	=	NORMALLY OPEN
N.O.T.C.	=	NORMALLY OPEN TIMED TO CLOSE
N.O.T.O.	=	NORMALLY OPEN TIMED TO OPEN
NP	=	NAMEPLATE
NTS	=	NOT TO SCALE
NOX	=	NITROGEN OXIDES
O	=	OXYGEN
O/C	=	OPEN/CLOSE
O.C.	=	ON CENTER
OA	=	OXYGEN ANALYZER or OVERALL
OAH	=	OXYGEN ALARM HIGH
OAHH	=	OXYGEN ALARM HIGH HIGH
OE	=	OXYGEN ELEMENT
OI	=	OXYGEN INDICATOR
OIR	=	OXYGEN INDICATING RECORDER
OT	=	OXYGEN TRANSMITTER
OIT	=	OXYGEN INDICATOR TRANSMITTER or OPERATOR INTERFACE TERMINAL
OSF	=	OXYGEN SENSOR FAILURE
OL or O/L	=	OVERLOAD
O/W	=	OIL/WATER
P	=	POWER or POLE (ELECTRICAL) or PUMP
PMP	=	PUMP
PA	=	PURGE AUTO
PAH	=	PRESSURE ALARM HIGH
PAHH	=	PRESSURE ALARM HIGH HIGH
PAL	=	PRESSURE ALARM LOW
PALL	=	PRESSURE ALARM LOW LOW
PB	=	PUSH BUTTON or PULL BOX
PC	=	PRESSURE CONTROLLER
PCV	=	PRESSURE CONTROL VALVE
PDI	=	PRESSURE DIFFERENTIAL INDICATOR
PE	=	POLYETHYLENE
PFD	=	PROCESS FLOW DIAGRAM
PG	=	PILOT GAS
PH	=	PHASE or PHONE
PI	=	PRESSURE INDICATOR
P&ID	=	PIPING AND INSTRUMENTATION DIAGRAM
PIC	=	PRESSURE INDICATING CONTROLLER
PID	=	PROCESS CONTROL LOOP
PIR	=	PRESSURE INDICATING RECORDER

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL

LFG/SVE/AI AND TREATMENT SYSTEM

ABBREVIATIONS

DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN	
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 03_60-0008GSA
CHECKED BY : M. PEARSON	DATE : 6-2015	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015	SHEET 3 OF 23

I:\dwg\Bozeman\Construction Drawings\03_60-0008GSA.dwg 6/10/15 09:28:09 scott.angus

MISCELLANEOUS ABBREVIATIONS (CONTINUED)

PIT	=	PRESSURE INDICATING TRANSMITTER
PLC	=	PROGRAMMABLE LOGIC CONTROLLER
PLT	=	PILOT
PNL	=	PANEL
POC	=	POINT OF CONNECTION
POS	=	POSITION, POSITIVE
POT	=	POTENTIOMETER
POZ	=	POSITIONER
PP	=	POWER PANEL or POWER POLE
PS	=	PRESSURE SWITCH or POWER SUPPLY
PSE	=	PRESSURE SAFETY ELEMENT
PSH	=	PRESSURE SWITCH HIGH
PSI	=	POUNDS PER SQUARE INCH
PSL	=	PRESSURE SWITCH LOW
PT	=	POINT or POTENTIAL TRANSFORMER or PRESSURE TRANSMITTER
PSV	=	PRESSURE RELIEF VALVE
PVC	=	POLYVINYL CHLORIDE
PWR	=	POWER
QL	=	TOTALIZER
R	=	RESISTANCE
REQD	=	REQUIRED
RD	=	RUPTURE DISK
RDAH	=	RUPTURE DISK ALARM HIGH
RDS	=	RUPTURE DISK SWITCH
REC or RECEPT	=	RECEPTACLE(S)
RES	=	RESISTOR
RGS	=	RIGID GALVANIZED STEEL
RM	=	RELAY MODULE
RPM	=	REVOLUTIONS PER MINUTE
RT	=	RAIN TIGHT or RETENTION TIME
RTC	=	RETENTION TIME CALCULATOR
RTU	=	RECEIVER/TRANSMITTER UNIT or REMOTE TERMINAL UNIT
S	=	**AIR STRIPPER or SPEED INDICATOR or SIGNAL WIRE or SWITCH (ELECTRICAL)**
SB	=	SPECTACLE BLIND
SCFH	=	STANDARD CUBIC FEET PER HOUR
SCFM	=	STANDARD CUBIC FEET PER MINUTE
SCH	=	SCHEDULE
SD	=	SHUTDOWN
SD/O	=	SHUTDOWN OR ON
SDR	=	STANDARD DIMENSION RATIO
SDV	=	SHUTDOWN VALVE
SEC	=	SECONDARY, SECONDS
SECT	=	SECTION
SEL	=	SELECTOR
SEQ	=	SEQUENCE, SEQUENCER
SF	=	SUPPLEMENTAL FUEL
SFR	=	SENSOR FAILURE
SG	=	SIGHT GLASS
SH	=	SHED
SHLD	=	SHIELD, SHIELDED
SHT	=	SHEET
SO	=	SHUT-OFF
SOC	=	SOCKET
SOCWLD	=	SOCKET WELD
SOL	=	SOLID
SOV	=	SOLENOID VALVE
SP	=	SAMPLE PORT or SINGLE POLE or SPARE
SPDT	=	SINGLE POLE DOUBLE THROW
SPECS	=	SPECIFICATION
SPGT	=	SPIGOT
SPST	=	SINGLE POLE SINGLE THROW
SS or SST	=	STAINLESS STEEL
SSR	=	SURGE ARRESTOR
ST	=	SINGLE THROW or SHUNT TRIP
STA	=	STATION
STD or STRD	=	STANDARD
STR	=	STRANDED or STRAINER
SVE	=	SOIL VAPOR EXTRACTION
SW	=	SWITCH
SWGEAR	=	SWITCH GEAR
SYS or SYST	=	SYSTEM
T or TK	=	TANK
TACH	=	TACHOMETER
TAH	=	TEMPERATURE ALARM HIGH
TAHH	=	TEMPERATURE ALARM HIGH HIGH
TAL	=	TEMPERATURE ALARM LOW
TALL	=	TEMPERATURE ALARM LOW LOW
TB	=	TERMINAL BLOCK
TC	=	TEMPERATURE CONTROLLER or TIME SWITCH
TCV	=	TEMPERATURE CONTROL VALVE
TCVI	=	TRANSCEIVER
TCZ	=	TEMPERATURE CONTROLLER POSITIONER
TD or TDR	=	TIME DELAY RELAY OR TEMPERATURE INDICATOR RECORDER
TDL	=	TUNABLE DIODE LASER
TE	=	TEMPERATURE ELEMENT (THERMOCOUPLE)
TEFC	=	TOTALLY ENCLOSED FAN-COOLED
TEL	=	TELEPHONE
TEMP	=	TEMPERATURE
TES	=	TEMPERATURE ELEMENT SWITCH
TEW	=	TEMPERATURE ELEMENT WELL
TGSM	=	TOXIC GAS SENSOR MODULE
THERM	=	THERMOSTAT
TI	=	TEMPERATURE INDICATOR
TIC	=	TEMPERATURE INDICATOR CONTROLLER
TIT	=	TEMPERATURE INDICATOR TRANSMITTER
TMR	=	TIMER
TOS	=	TOP OF SLAB ELEVATION
TR	=	TEMPERATURE RECORDER
TS	=	TEMPERATURE SWITCH or TIME SWITCH
TSE	=	TEMPERATURE SAFETY ELEMENT
TSH	=	TEMPERATURE SWITCH HIGH
TSHH	=	TEMPERATURE SWITCH HIGH HIGH
TSL	=	TEMPERATURE SWITCH LOW
TSO	=	TIGHT SHUTOFF
TSTAT	=	THERMOSTAT
TSV	=	TEMPERATURE SAFETY VALVE
TT	=	TEMPERATURE TRANSMITTER
TV	=	TELEVISION or TEMPERATURE VALVE
TYP	=	TYPICAL
UG	=	UNDERGROUND
UPS	=	UNINTERRUPTIBLE POWER SUPPLY
UV	=	ULTRAVIOLET SCANNER
V	=	VESSEL or VOLTS
VA	=	VIBRATION ALARM or VOLT AMPS
VAC	=	VACUUM
VAH	=	VIBRATION ALARM HIGH
VAHH	=	VIBRATION ALARM HIGH HIGH
VBL	=	VENT BLOWER
VD	=	VOLTAGE DROP
VFD	=	VARIABLE FREQUENCY DRIVE
VI	=	VIBRATION INDICATOR
VIR	=	VIBRATION INDICATING RECORDER
VP	=	VAPOR PROOF
VS	=	VIBRATION SWITCH
VSD	=	VARIABLE SPEED DRIVE
VSH	=	VIBRATION SWITCH HIGH
VT	=	VIBRATION TRANSMITTER
W	=	WATTS or WIDE
W.C.	=	WATER COLUMN
WELLHD	=	WELLHEAD
WLD	=	WELD
WP	=	WEATHER PROOF
XFMR	=	TRANSFORMER
XP	=	EXPLOSION PROOF
YA	=	EVENT ALARM
YI	=	EVENT INDICATOR
YIC	=	EVENT INDICATOR CONTROLLER
Z	=	IMPEDANCE (ELECTRICAL)
ZA	=	POSITION ALARM
ZC	=	POSITION CONTROLLER
ZI	=	POSITION INDICATOR
ZS	=	POSITION SWITCH
ZSL/ZSC	=	POSITION SWITCH CLOSED
ZSH/ZSO	=	POSITION SWITCH OPENED
°F	=	DEGREE FAHRENHEIT
Δ P	=	DIFFERENTIAL PRESSURE
1P	=	SINGLE POLE
2P	=	TWO POLE
3P	=	THREE POLE
Ø	=	PHASE (ELECTRICAL)

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811 Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

CITY OF BOZEMAN 1883 GALLATIN CO. MONTANA

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL

LFG/SVE/AI AND TREATMENT SYSTEM

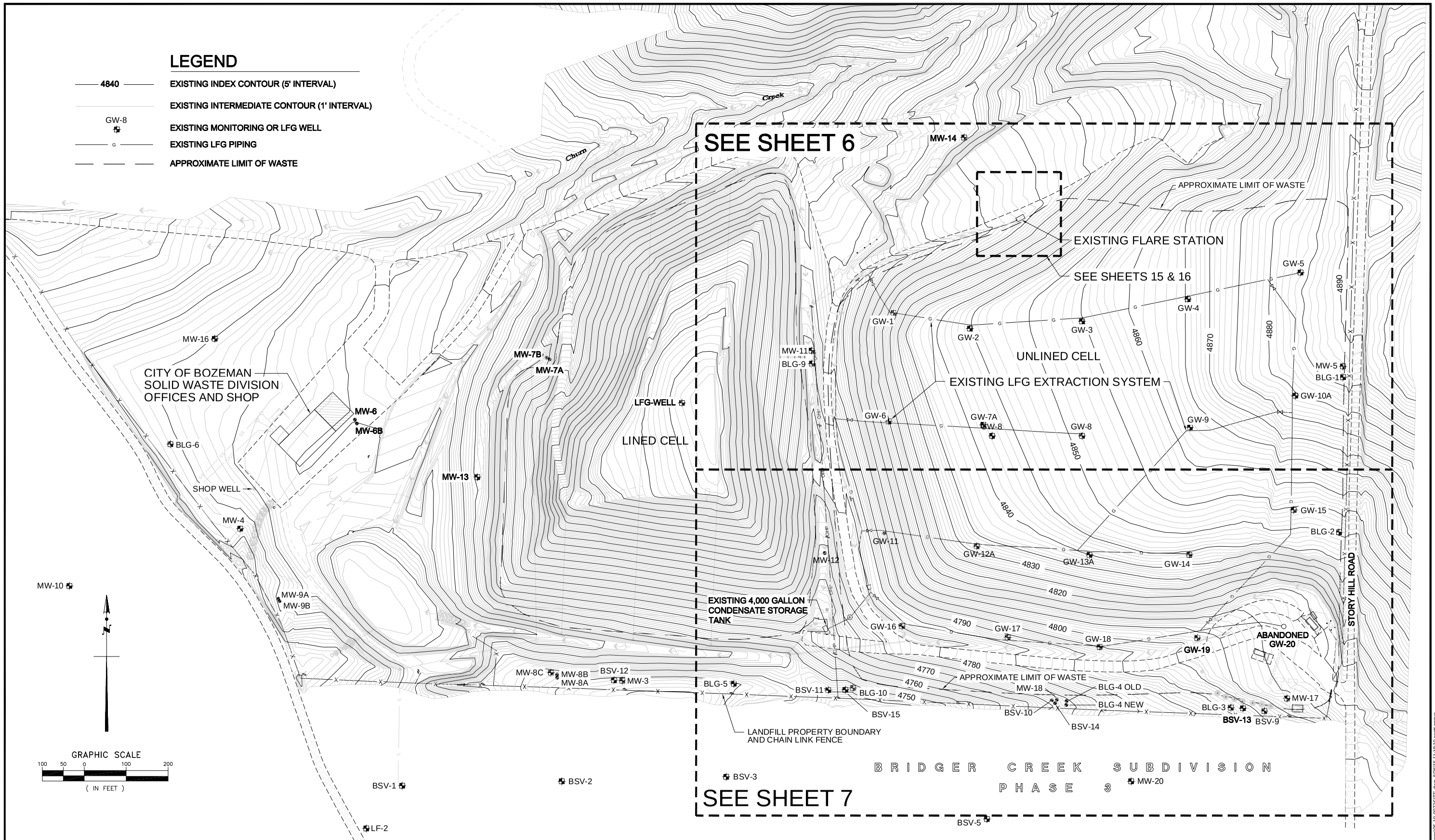
ABBREVIATIONS

DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN	
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 04_60-0009GSA
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 4 OF 23
APPROVED BY : L. CAWLFIELD	DATE : 6-2015	

I:\dwg\Bozeman\Construction Drawings\04_60-0009GSA.dwg 5/27/15 13:21:39 scott.angus

LEGEND

- 4840 — EXISTING INDEX CONTOUR (5' INTERVAL)
- EXISTING INTERMEDIATE CONTOUR (1' INTERVAL)
- GW-8 — EXISTING MONITORING OR LFG WELL
- G — EXISTING LFG PIPING
- APPROXIMATE LIMIT OF WASTE



NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811 Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

CITY OF BOZEMAN — GALLATIN CO. MONTANA — 1883

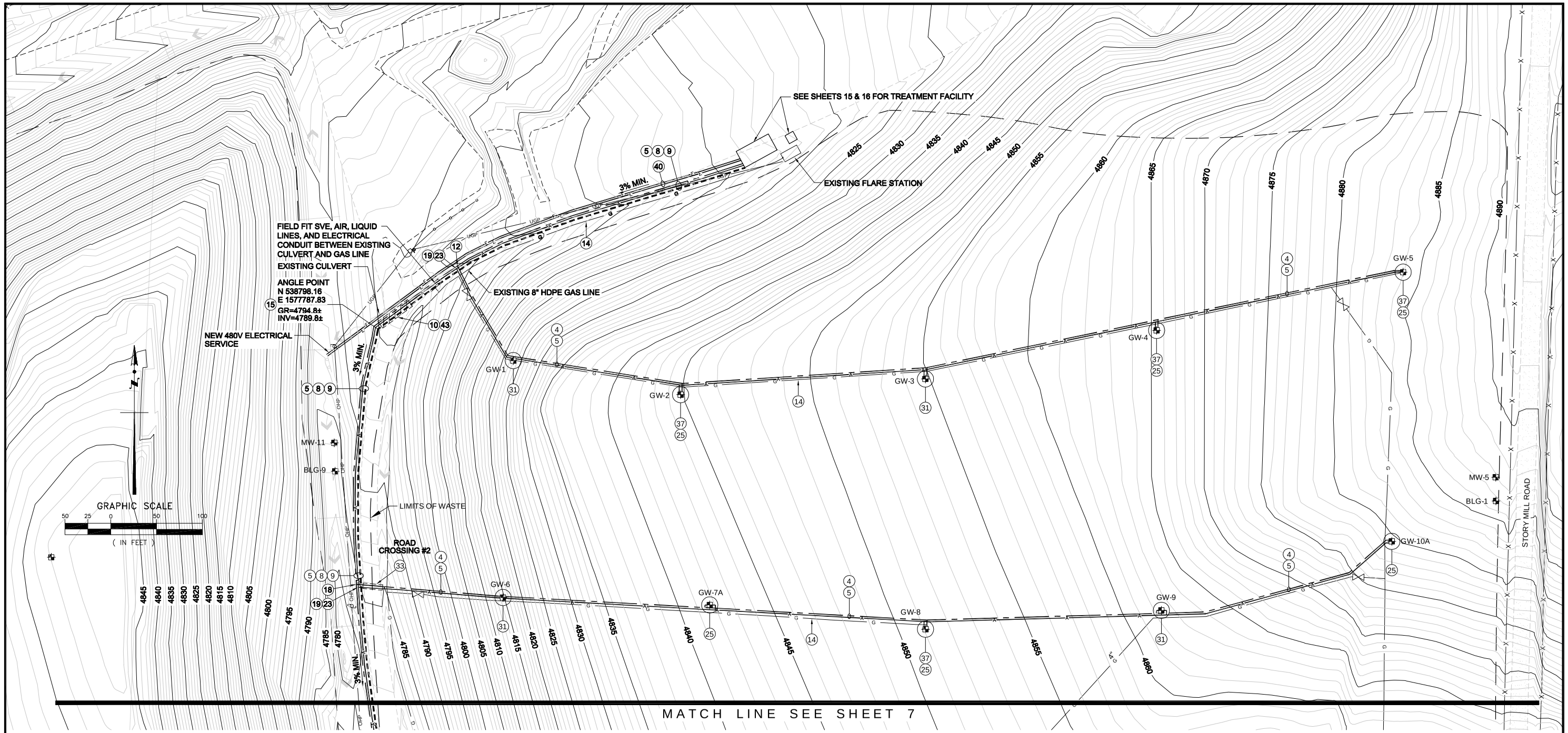
TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL

LFG/SVE /AI and TREATMENT SYSTEM

SITE PLAN/INDEX TO PLAN SHEETS

DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 05-10-0072SITE	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 5 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		



LEGEND

MW/BLG	EXISTING MONITORING WELL
GW-1 TO GW-21	EXISTING LANDFILL GAS EXTRACTION WELL
GW-22 TO GW-26	PROPOSED LANDFILL GAS EXTRACTION WELL
SVE-1	PROPOSED SOIL VAPOR EXTRACTION WELL
AI-1	PROPOSED AIR INJECTION WELL
	PROPOSED WELL MANIFOLD (REMOTE WELLHEADS)
X	EXISTING CHAIN LINK FENCE/PROPERTY BOUNDARY
	PROPOSED LANDFILL GAS OR SVE GAS CONVEYANCE LINE
A	PROPOSED COMPRESSED AIR LINE
	PROPOSED CONDENSATE CONVEYANCE LINE
E	PROPOSED ELECTRICAL SERVICE CONDUIT
4840	EXISTING INDEX CONTOUR (5' INTERVAL)
	EXISTING INTERMEDIATE CONTOUR (1' INTERVAL)
UGP	EXISTING UNDERGROUND ELECTRICAL LINE

FIELD CONSTRUCTION NOTES:

1. INSTALL LANDFILL GAS EXTRACTION WELL PER DETAIL 1, SHEET 8
2. INSTALL AIR INJECTION WELL PER DETAIL 3, SHEET 8
3. INSTALL SOIL VAPOR EXTRACTION (SVE) WELL PER DETAIL 2, SHEET 8
4. INSTALL 2" SDR 9 HDPE COMPRESSED AIR PIPE & FITTINGS PER DETAIL 7, SHEET 9
5. INSTALL 2" SDR 11 HDPE CONDENSATE PIPE & FITTINGS PER DETAIL 7, SHEET 9
6. INSTALL 4" SDR 17 HDPE LFG/SVE PIPE & FITTINGS PER DETAIL 7, SHEET 9
7. INSTALL 6" SDR 17 HDPE LANDFILL SVE PIPE & FITTINGS PER DETAIL 7, SHEET 9
8. INSTALL 8" SDR 17 HDPE LANDFILL SVE PIPE & FITTINGS PER DETAIL 7, SHEET 9
9. INSTALL 4" SDR 9 COMPRESSED AIR PIPE & FITTINGS PER DETAIL 7, SHEET 9
10. CAUTION WHEN CROSSING EXISTING CULVERT, PIPING, OR ELECTRICAL LINE
11. JOIN EXISTING HDPE LINE
12. INSTALL 2" HDPE 90° ELBOW
13. INSTALL 4" HDPE 90° ELBOW
14. PROTECT IN-PLACE
15. INSTALL 8" HDPE 45° ELBOW
16. -
17. -
18. INSTALL 2" HDPE TEE
19. INSTALL 4" HDPE TEE
20. INSTALL 6" HDPE TEE
21. INSTALL 8" HDPE TEE
22. INSTALL 8" X 6" HDPE REDUCER
23. INSTALL 4" X 2" HDPE REDUCER
24. INSTALL 6" X 4" HDPE REDUCER
25. INSTALL PUMP, HOSES, AND FITTINGS PER DETAIL 1 OR 2, SHEET 11
26. INSTALL 4" HDPE FLANGE ADAPTER, D.I. BACK-UP RING, AND HARDWARE
27. INSTALL 6" HDPE FLANGE ADAPTER, D.I. BACK-UP RING, AND HARDWARE
28. REMOVE AND RE-INSTALL FENCING, AS NEEDED, FOR ACCESS
29. INSTALL CONDENSATE SUMP #1 PER DETAIL 1, SHEET 12
30. INSTALL CONDENSATE SUMP #2 PER DETAIL 2, SHEET 12
31. STUB-UP AND CAP AIR AND LIQUID LINES AT EXISTING WELL ONLY
32. INSTALL AIR INJECTION WELL VAULT PER DETAIL 5, SHEET 9
33. INSTALL 12" HDPE SLEEVE/ROAD CROSSING PER DETAIL 1, SHEET 9
34. INSTALL SVE WELL VAULT PER DETAIL 4, SHEET 9
35. INSTALL 30" x 60" CONCRETE VAULT WITH SPRING ASSISTED COVER
36. CONNECT TWO 2" CONDENSATE LINES TO EXISTING 4" HDPE LINE @ TANK PER DETAIL 1, SHEET 10
37. INSTALL DUAL EXTRACTION WELLHEAD ASSEMBLY PER DETAIL 1, SHEET 11
38. INSTALL SVE REMOTE WELLHEAD IN VAULT PER DETAIL 2, SHEET 9
39. INSTALL AIR INJECTION REMOTE WELLHEAD IN VAULT PER DETAIL 3, SHEET 9
40. INSTALL 2-3" ELECTRICAL CONDUITS (480V/3Ø FEEDER TO FLARE STATION PER SHEETS 21 & 22)
41. INSTALL 4" HDPE BLIND FLANGE
42. INSTALL 6" HDPE BLIND FLANGE
43. INSTALL 18" HDPE SLEEVE/ROAD CROSSING PER DETAIL 8, SHEET 9
44. INSTALL 18" HDPE SLEEVE/ROAD CROSSING PER DETAIL 9, SHEET 9

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

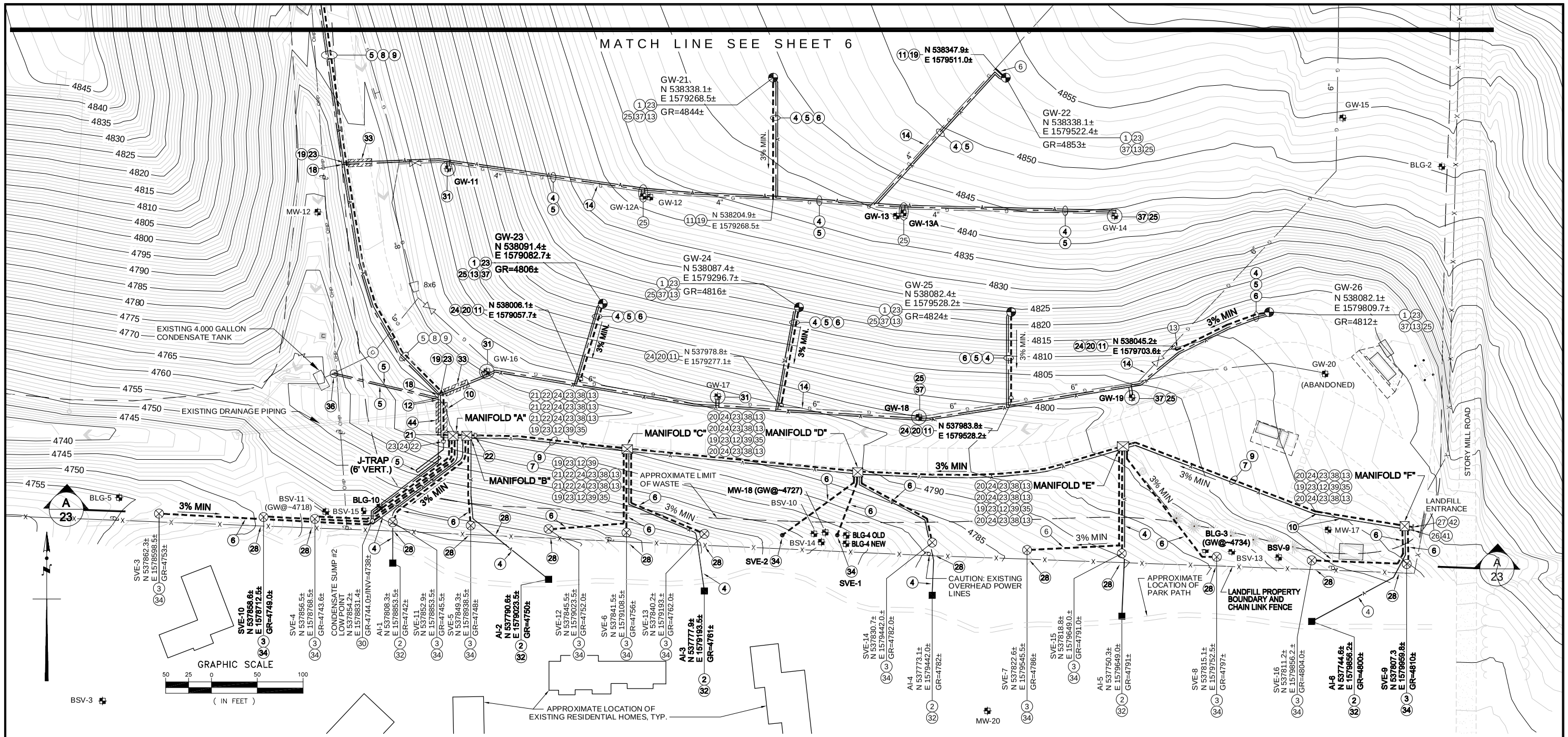
TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL

LFG/SVE/AI AND TREATMENT SYSTEM

LFG/SVE/AIR INJECTION SYSTEM PLAN

DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN	
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 06-86-0154GSP
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 6 OF 23
APPROVED BY : L. CAWLFIELD	DATE : 6-2015	



LEGEND

GW-1 TO GW-20	EXISTING LFG EXTRACTION WELL
BSV/MW/BLG	EXISTING MONITORING WELL
GW-21	PROPOSED LANDFILL GAS EXTRACTION WELL
SVE-1	PROPOSED SOIL VAPOR EXTRACTION WELL
AI-1	PROPOSED AIR INJECTION WELL
	PROPOSED WELL MANIFOLD (REMOTE WELLHEADS)
X	CHAIN LINK FENCE/PROPERTY BOUNDARY
	PROPOSED LANDFILL GAS OR SVE GAS CONVEYANCE LINE
A	PROPOSED COMPRESSED AIR LINE
	PROPOSED LIQUID CONVEYANCE LINE
4840	EXISTING INDEX CONTOUR (5' INTERVAL)
	EXISTING INTERMEDIATE CONTOUR (1' INTERVAL)
OHP	EXISTING OVERHEAD POWER LINE

FIELD CONSTRUCTION NOTES:

1. INSTALL LANDFILL GAS EXTRACTION WELL PER DETAIL 1, SHEET 8
2. INSTALL AIR INJECTION WELL PER DETAIL 3, SHEET 8
3. INSTALL SOIL VAPOR EXTRACTION (SVE) WELL PER DETAIL 2, SHEET 8
4. INSTALL 2" SDR 9 HDPE COMPRESSED AIR PIPE & FITTINGS PER DETAIL 7, SHEET 9
5. INSTALL 2" SDR 11 HDPE CONDENSATE PIPE & FITTINGS PER DETAIL 7, SHEET 9
6. INSTALL 4" SDR 17 HDPE LFG/SVE PIPE & FITTINGS PER DETAIL 7, SHEET 9
7. INSTALL 6" SDR 17 HDPE LANDFILL SVE PIPE & FITTINGS PER DETAIL 7, SHEET 9
8. INSTALL 8" SDR 17 HDPE LANDFILL SVE PIPE & FITTINGS PER DETAIL 7, SHEET 9
9. INSTALL 4" SDR 9 COMPRESSED AIR PIPE & FITTINGS PER DETAIL 7, SHEET 9
10. CAUTION WHEN CROSSING EXISTING CULVERT, PIPING, OR ELECTRICAL LINE
11. JOIN EXISTING HDPE LINE
12. INSTALL 2" HDPE 90° ELBOW
13. INSTALL 4" HDPE 90° ELBOW
14. PROTECT IN-PLACE
15. INSTALL 8" HDPE 45° ELBOW
16. -
17. -
18. INSTALL 2" HDPE TEE
19. INSTALL 4" HDPE TEE
20. INSTALL 6" HDPE TEE
21. INSTALL 8" HDPE TEE
22. INSTALL 8" X 6" HDPE REDUCER
23. INSTALL 4" X 2" HDPE REDUCER
24. INSTALL 6" X 4" HDPE REDUCER
25. INSTALL PUMP, HOSES, AND FITTINGS PER DETAIL 1 OR 2, SHEET 11
26. INSTALL 4" HDPE FLANGE ADAPTER, D.I. BACK-UP RING, AND HARDWARE
27. INSTALL 6" HDPE FLANGE ADAPTER, D.I. BACK-UP RING, AND HARDWARE
28. REMOVE AND RE-INSTALL FENCING, AS NEEDED, FOR ACCESS
29. INSTALL CONDENSATE SUMP #1 PER DETAIL 1, SHEET 12
30. INSTALL CONDENSATE SUMP #2 PER DETAIL 2, SHEET 12
31. STUB-UP AND CAP AIR AND LIQUID LINES AT EXISTING WELL ONLY
32. INSTALL AIR INJECTION WELL VAULT PER DETAIL 5, SHEET 9
33. INSTALL 12" HDPE SLEEVE/ROAD CROSSING PER DETAIL 1, SHEET 9
34. INSTALL SVE WELL VAULT PER DETAIL 4, SHEET 9
35. INSTALL 30" x 60" CONCRETE VAULT WITH SPRING ASSISTED COVER
36. CONNECT TWO 2" CONDENSATE LINES TO EXISTING 4" HDPE LINE @ TANK PER DETAIL 1, SHEET 10
37. INSTALL DUAL EXTRACTION WELLHEAD ASSEMBLY PER DETAIL 1, SHEET 11
38. INSTALL SVE REMOTE WELLHEAD IN VAULT PER DETAIL 2, SHEET 9
39. INSTALL AIR INJECTION REMOTE WELLHEAD IN VAULT PER DETAIL 3, SHEET 9
40. INSTALL 2-3" ELECTRICAL CONDUITS (480V/3Ø FEEDER TO FLARE STATION PER SHEETS 21 & 22)
41. INSTALL 4" HDPE BLIND FLANGE
42. INSTALL 6" HDPE BLIND FLANGE
43. INSTALL 18" HDPE SLEEVE/ROAD CROSSING PER DETAIL 8, SHEET 9
44. INSTALL 18" HDPE SLEEVE/ROAD CROSSING PER DETAIL 9, SHEET 9

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811 Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

CITY OF BOZEMAN 1883 GALLATIN CO. MONTANA

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL

LFG/SVE/AI AND TREATMENT SYSTEM

LFG/SVE/AIR INJECTION SYSTEM PLAN

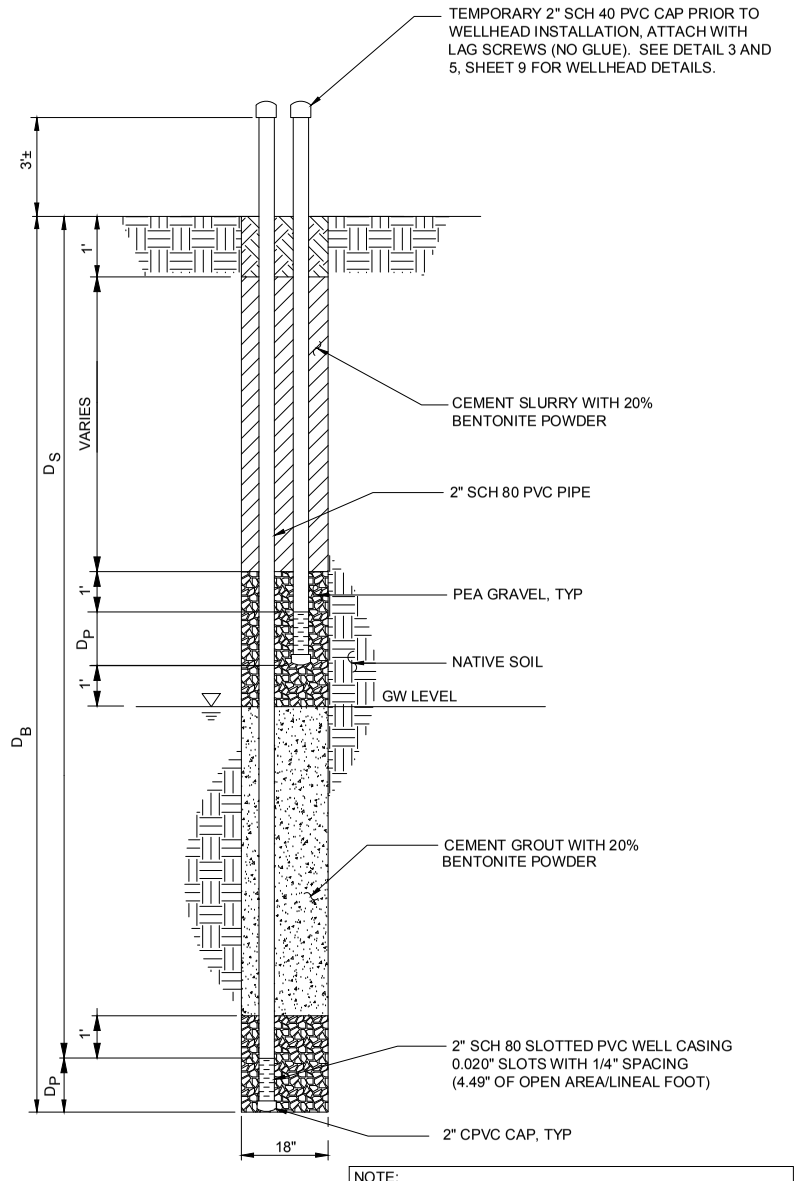
DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 07-86-0155GSP	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 7 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		

I:\dwg\Bozeman\Construction Drawings\07-86-0155GSP.dwg 7/02/15 14:37:53 scott.angus

DUAL DEPTH AIR INJECTION WELL DRILLING SCHEDULE

WELL #	WELL COORDINATES		ELEV. (AMSL, FT.)	BOREHOLE DEPTH IN FEET (D_B)	PIPE LENGTH (FEET)		ANTICIPATED DEPTH TO GROUNDWATER (BGS)
	NORTHING	EASTING	GROUND SURFACE		SLOTTED PIPE (D_P)	SOLID PIPE (D_S)	
AI-5	SEE PLAN SHEETS		4791	76.5	1	75.5	62
AI-6	SEE PLAN SHEETS		4800	83.5	1	82.5	69

TOTAL DRILLING: 160 VF



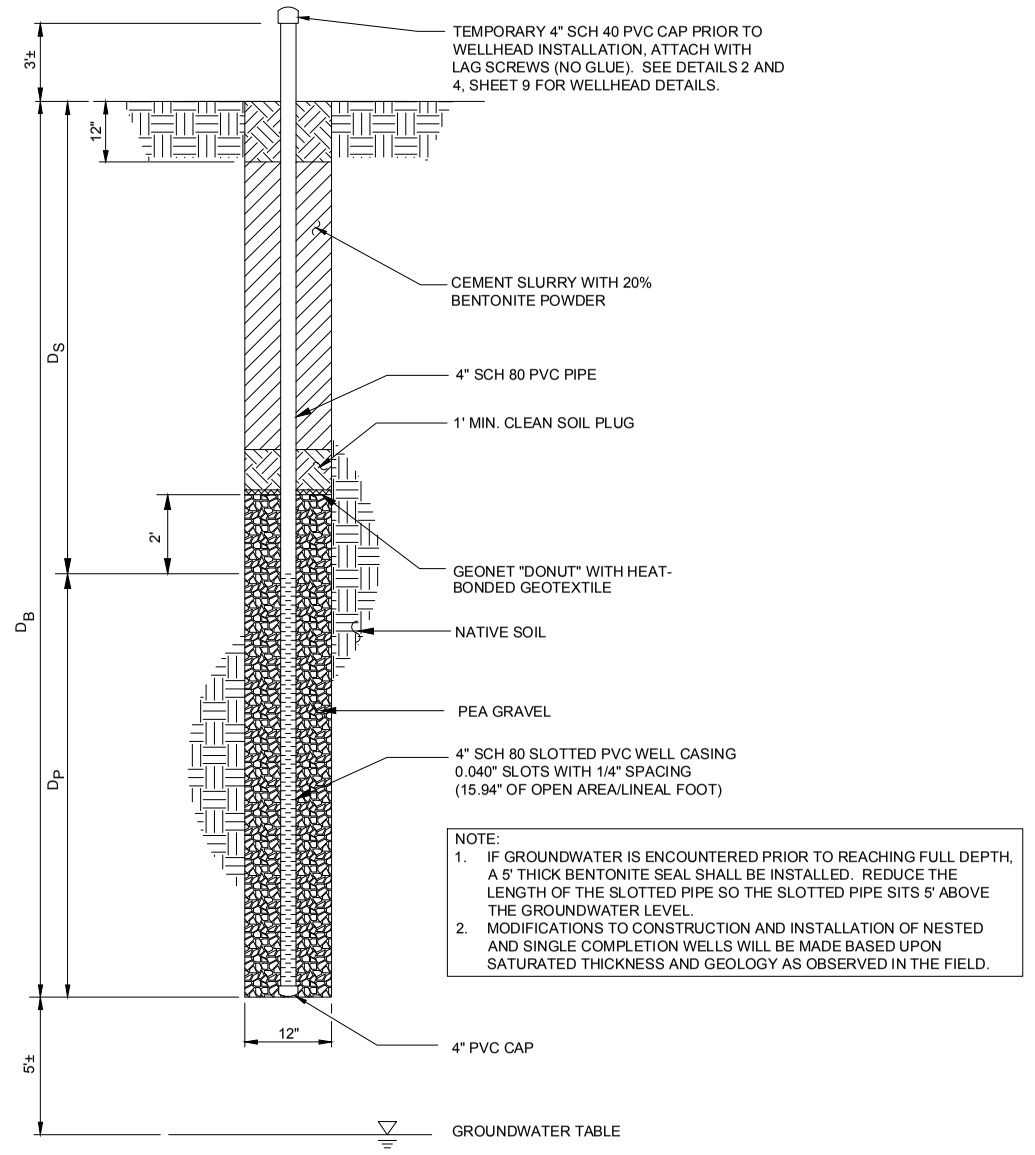
NOTE:
MODIFICATIONS TO CONSTRUCTION AND INSTALLATION OF NESTED AND SINGLE COMPLETION WELLS WILL BE MADE BASED UPON SATURATED THICKNESS AND GEOLOGY AS OBSERVED IN THE FIELD.

DUAL DEPTH
AIR INJECTION WELL DETAIL — 1 / 8
NTS

SVE WELL DRILLING SCHEDULE

WELL #	WELL COORDINATES		ELEV. (AMSL, FT.)	BOREHOLE DEPTH IN FEET (D_B)	PIPE LENGTH (FEET)		ANTICIPATED DEPTH TO GROUNDWATER	NOTES
	NORTHING	EASTING	APPROXIMATE GROUND SURFACE		SLOTTED PIPE (D_P)	SOLID PIPE (D_S)		
SVE-3	SEE PLAN SHEETS		4753	34	14	20	39	
SVE-4			4743	21	11	10	26	
SVE-5			4748	23.5	13.5	10	28.5	
SVE-6			4763	35	15	20	40.5	
SVE-7			4783	50	30	20	55	
SVE-8			4797	62	42	20	67	
SVE-9			4810	72	42	30	77	
SVE-10			4749	20	10	10	N/A	
SVE-11			4745	20	10	10	N/A	
SVE-12			4752	20	10	10	N/A	
SVE-13			4762	20	10	10	N/A	
SVE-14			4782	20	10	10	N/A	
SVE-15			4791	20	10	10	N/A	
SVE-16			4804	20	10	10	N/A	

TOTAL DRILLING: 438 VF
SVE-1 (47' DEPTH) AND SVE-2 (42' DEPTH) ARE EXISTING WELLS TO BE CONNECTED TO SVE GAS HEADER.



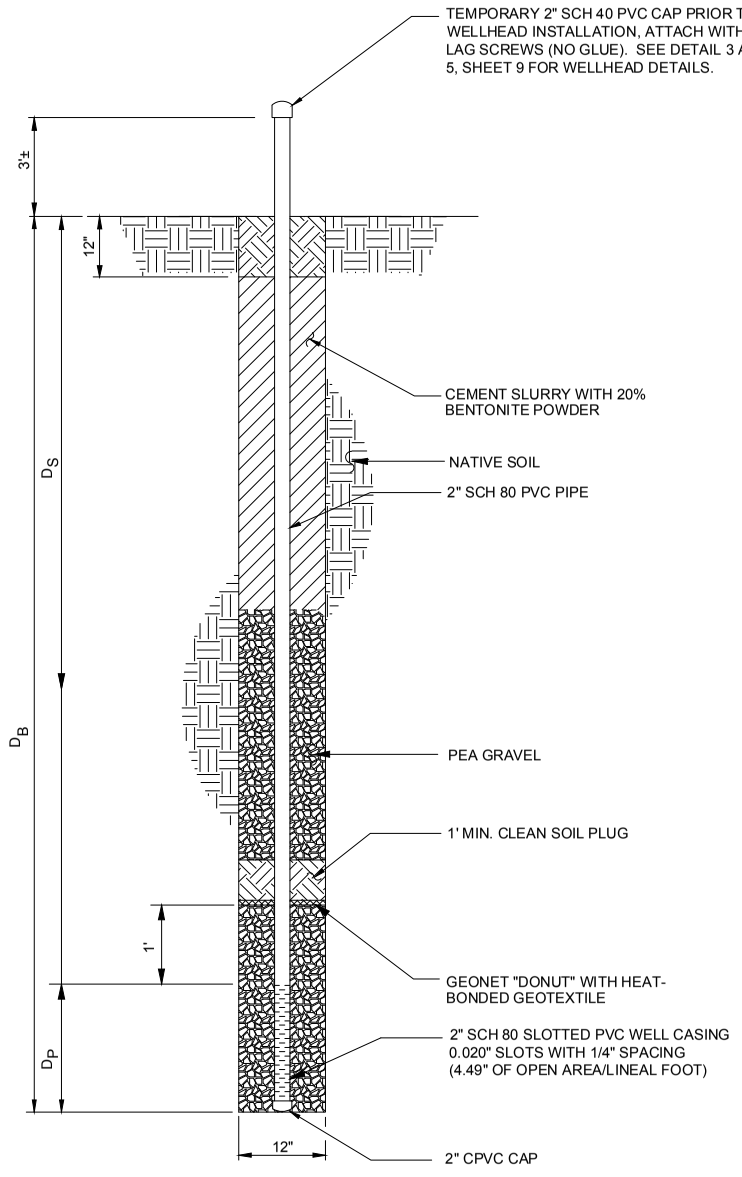
NOTE:
1. IF GROUNDWATER IS ENCOUNTERED PRIOR TO REACHING FULL DEPTH, A 5' THICK BENTONITE SEAL SHALL BE INSTALLED. REDUCE THE LENGTH OF THE SLOTTED PIPE SO THE SLOTTED PIPE SITS 5' ABOVE THE GROUNDWATER LEVEL.
2. MODIFICATIONS TO CONSTRUCTION AND INSTALLATION OF NESTED AND SINGLE COMPLETION WELLS WILL BE MADE BASED UPON SATURATED THICKNESS AND GEOLOGY AS OBSERVED IN THE FIELD.

TYPICAL SVE WELL DETAIL — 2 / 8
NTS (SEE GEOLOGIC CROSS SECTION - SHEET 23)

AIR INJECTION WELL DRILLING SCHEDULE

WELL #	WELL COORDINATES		ELEV. (AMSL, FT.)	BOREHOLE DEPTH IN FEET (D_B)	PIPE LENGTH (FEET)		ANTICIPATED DEPTH TO GROUNDWATER (BGS)
	NORTHING	EASTING	GROUND SURFACE		SLOTTED PIPE (D_P)	SOLID PIPE (D_S)	
AI-1	SEE PLAN SHEETS		4742	37	1	22	25
AI-2			4750	43.5	1	28.5	31
AI-3			4761	52.5	1	37.5	39
AI-4			4782	69.5	1	54.5	56

TOTAL DRILLING: 155 VF



NOTE:
MODIFICATIONS TO CONSTRUCTION AND INSTALLATION OF NESTED AND SINGLE COMPLETION WELLS WILL BE MADE BASED UPON SATURATED THICKNESS AND GEOLOGY AS OBSERVED IN THE FIELD.

TYPICAL AIR INJECTION WELL DETAIL — 3 / 8
NTS (SEE GEOLOGIC CROSS SECTION - SHEET 23)

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811 Know what's below. Call before you dig.
Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

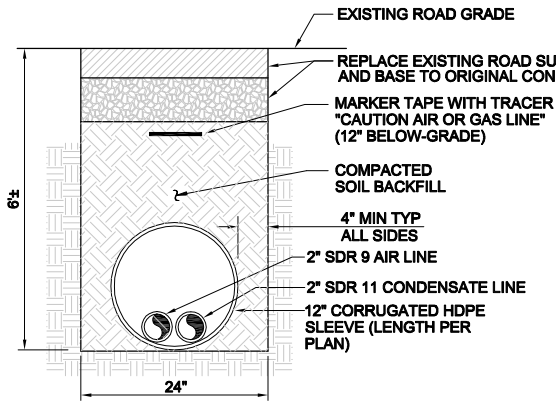
CITY OF BOZEMAN 1883 GALLATIN CO. MONTANA

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

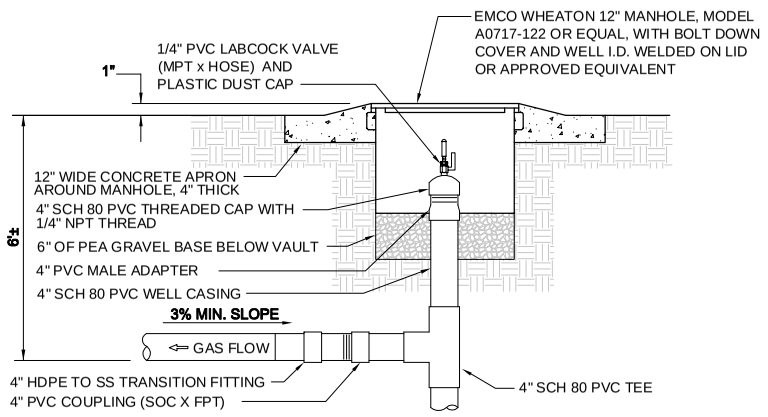
BOZEMAN LANDFILL
LFG/SVE/AI AND TREATMENT SYSTEM
WELL DRILLING DETAILS AND SCHEDULES

DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 08-85-0164GSD	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 8 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		

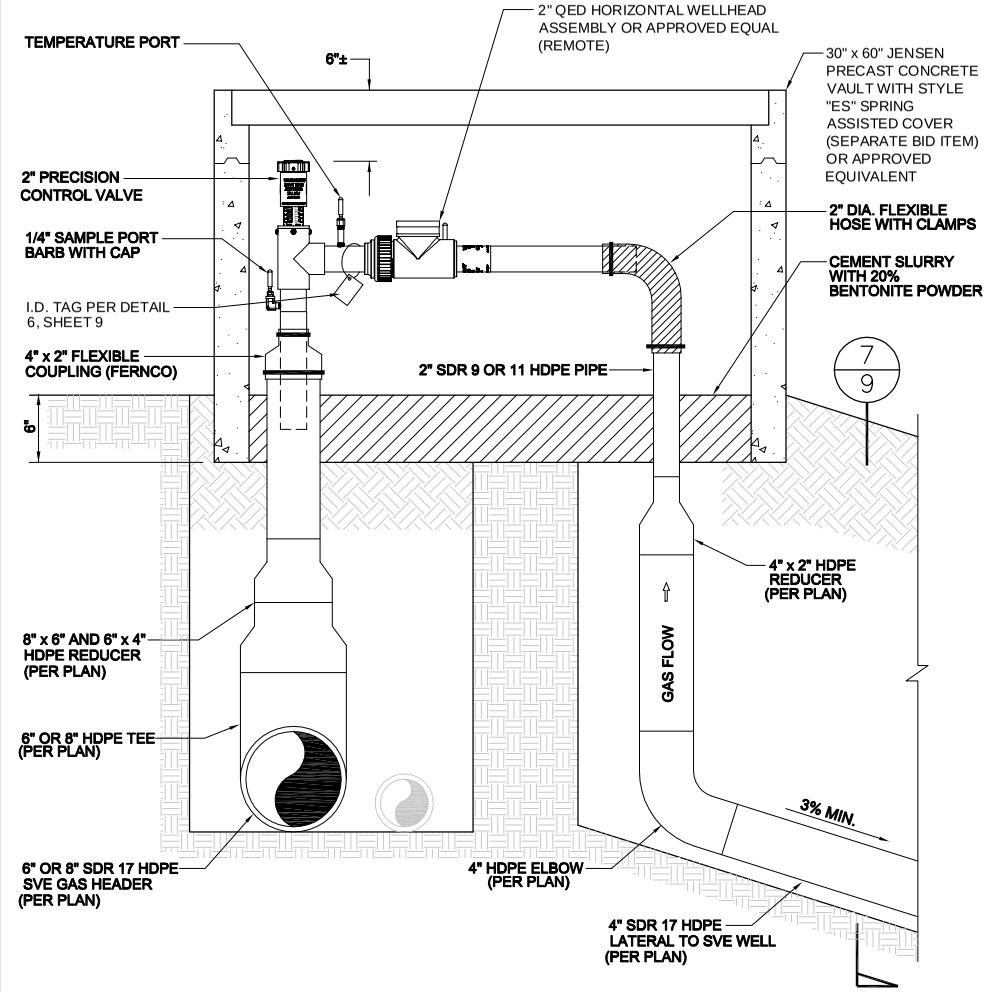
C:\Users\bnooks.quaintance\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Outlook\BV1WK8VW4\08-85-01643SD.dwg 7/10/15 11:22:49 bnooks.quaintance



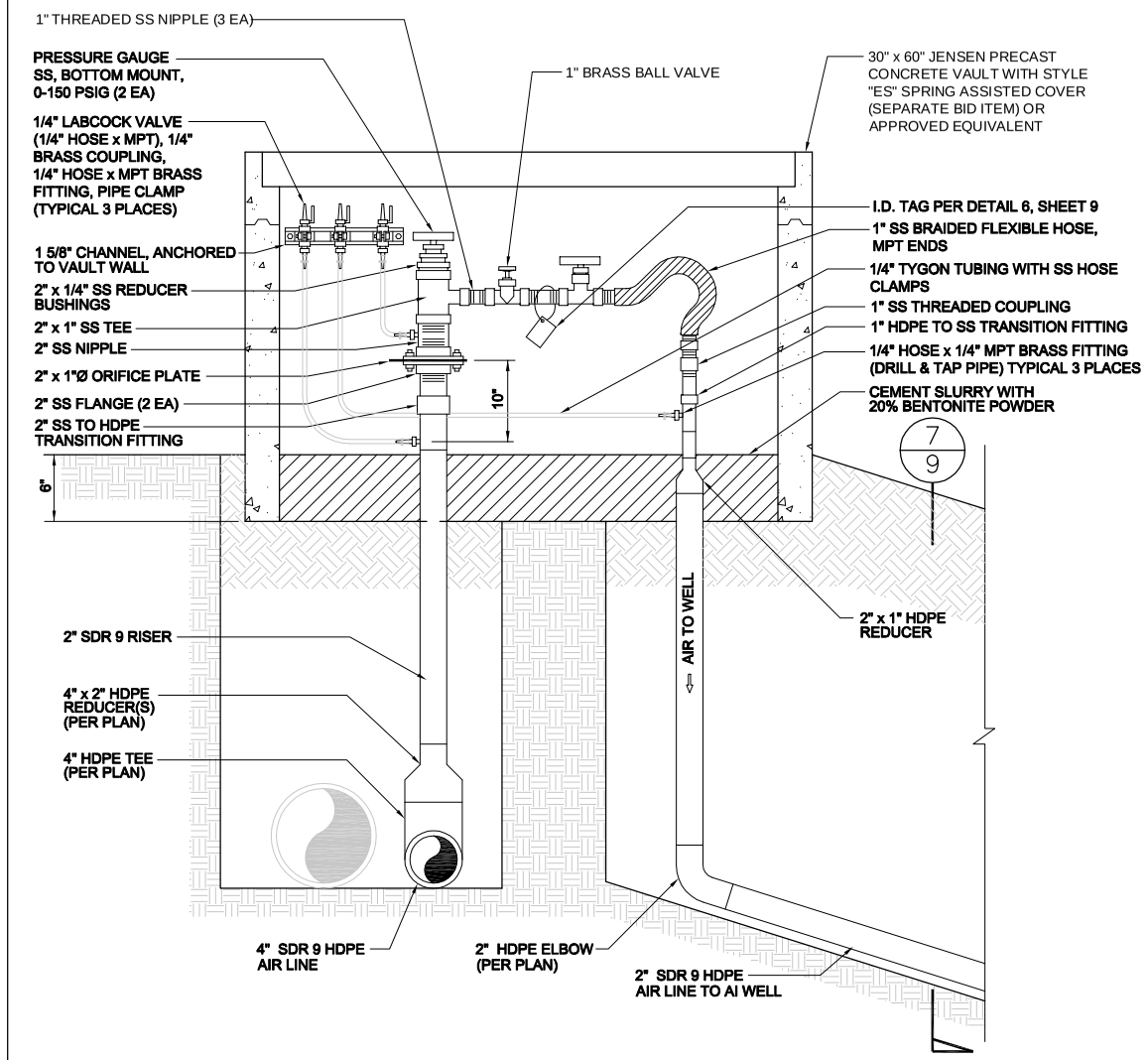
ROAD CROSSING DETAIL
NTS — 1/9



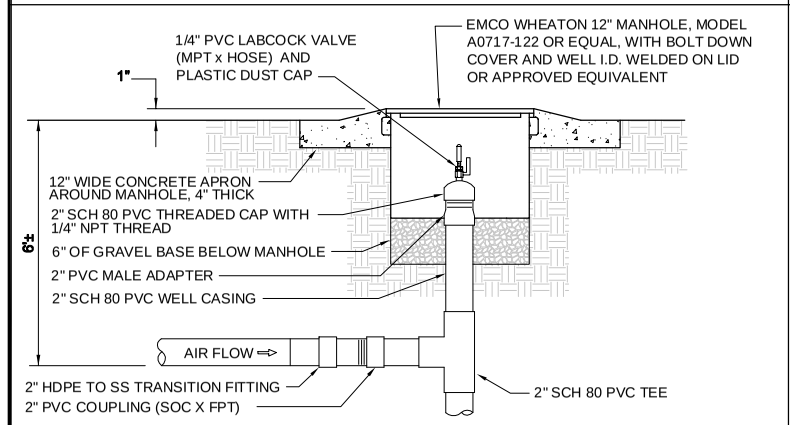
TYPICAL SVE WELL CASING DETAIL
NTS — 4/9



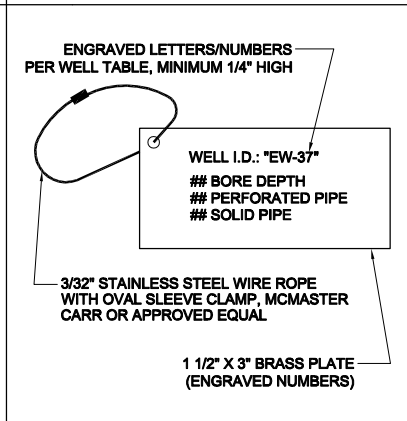
TYPICAL SVE REMOTE WELLHEAD DETAIL AT MANIFOLD
NTS (UP TO 4 WELLHEADS PER VAULT) — 2/9



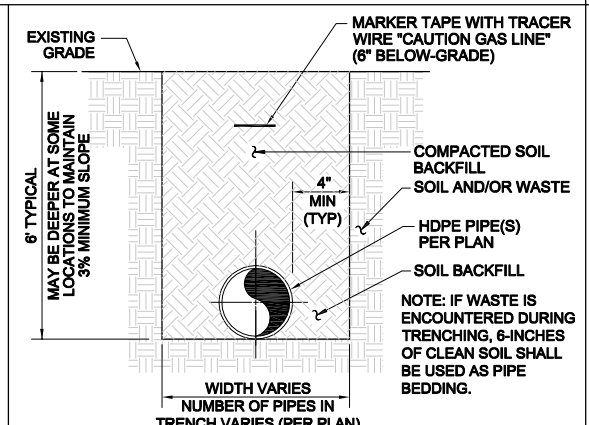
TYPICAL AIR INJECTION REMOTE WELLHEAD DETAIL AT MANIFOLD
NTS (UP TO 4 WELLHEADS PER VAULT) — 3/9



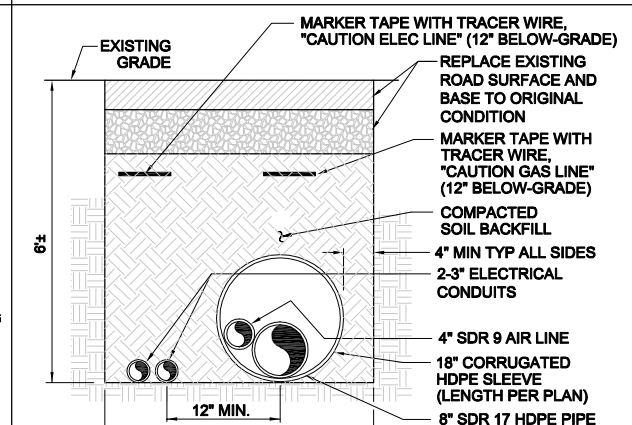
TYPICAL AIR INJECTION WELL CASING DETAIL
NTS — 5/9



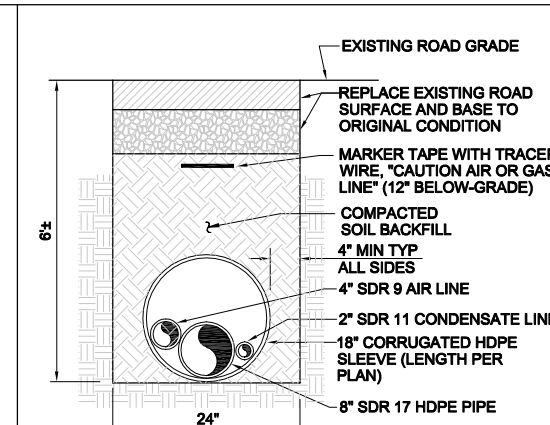
WELL I.D. TAG DETAIL
NTS — 6/9



TYPICAL TRENCH SECTION
NTS — 7/9



ROAD CROSSING DETAIL
NTS — 8/9



ROAD CROSSING DETAIL
NTS — 9/9

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811 Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

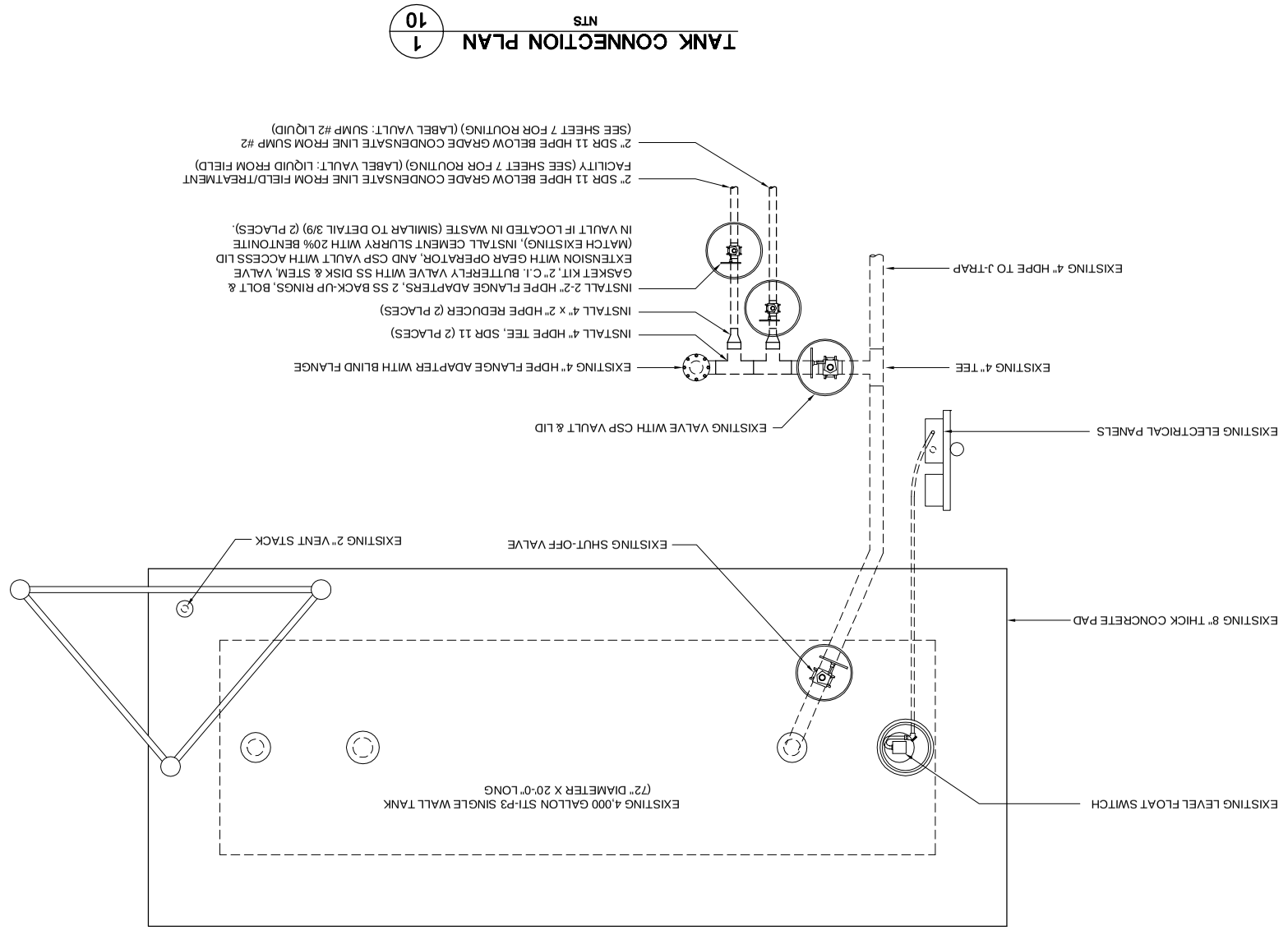
CITY OF BOZEMAN · GALLATIN CO. MONTANA · 1883

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL
LFG/SVE/AI AND TREATMENT SYSTEM
LFG/SVE/AI SYSTEM DETAILS

DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 09-85-0165GSD	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 9 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		

I:\dwg\Bozeman\Construction Drawings\09-85-0165GSD.dwg 7/07/15 16:06:05 scott.angus



TANK CONNECTION PLAN

1/10 NTS

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811 Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

CITY OF BOZEMAN GALLATIN CO. MONTANA 1883

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

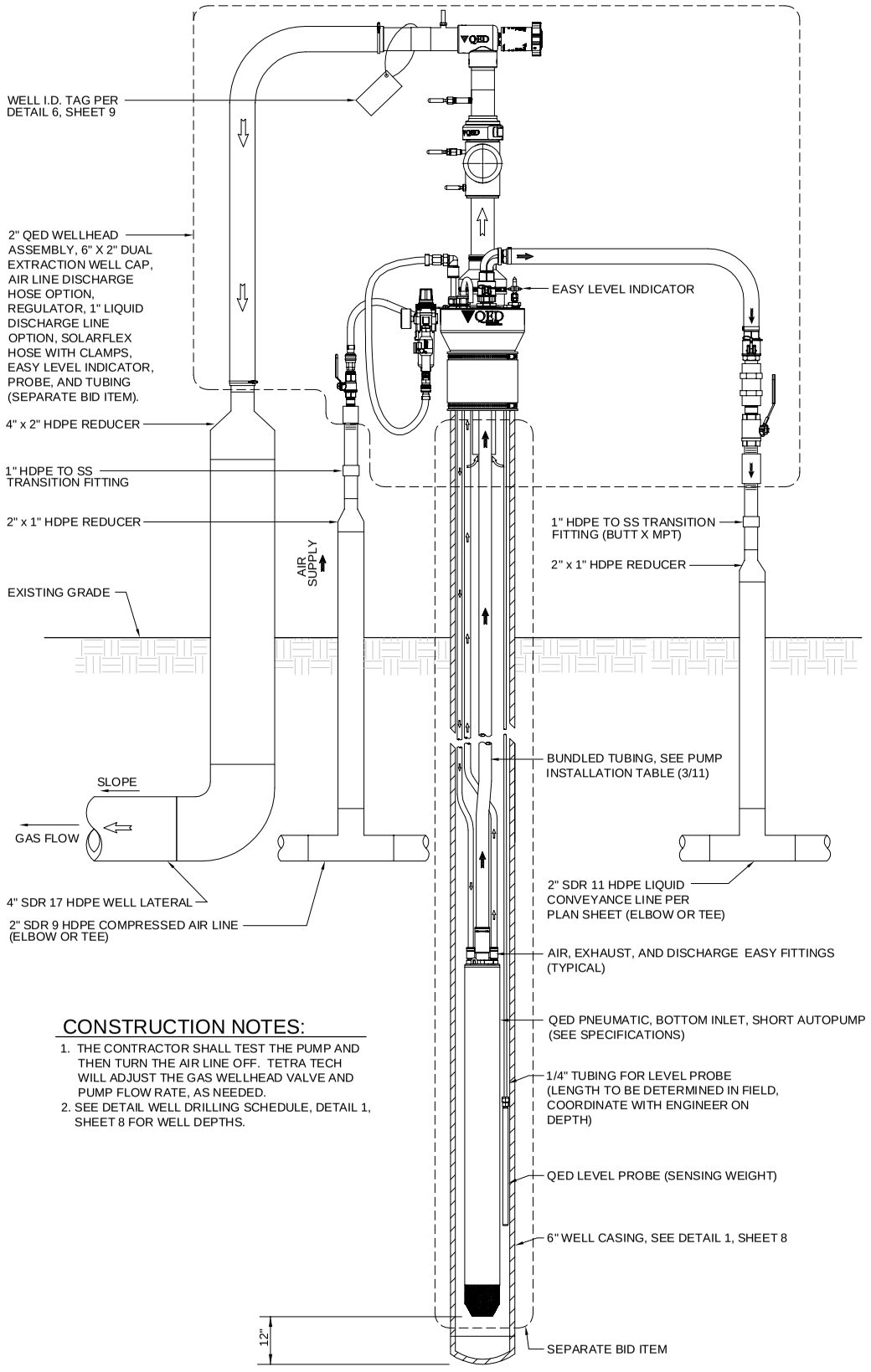
BOZEMAN LANDFILL

LFG/SVE/AI AND TREATMENT SYSTEM

LFG/SVE/AI SYSTEM DETAILS

DESIGNED BY:	K. JOHNSON	SCALE: AS SHOWN	
DRAWN BY:	S. ANGUS	DATE: 6-2015	FILE NO.: 10-85-01666SD
CHECKED BY:	M. PEARSON	DATE: 6-2015	
APPROVED BY:	L. CAWLFIELD	DATE: 6-2015	SHEET 10 OF 23

I:\drwg\Bozeman\Construction Drawings\10-85-01666SD.dwg 6/27/15 13:56:15 scott.angus



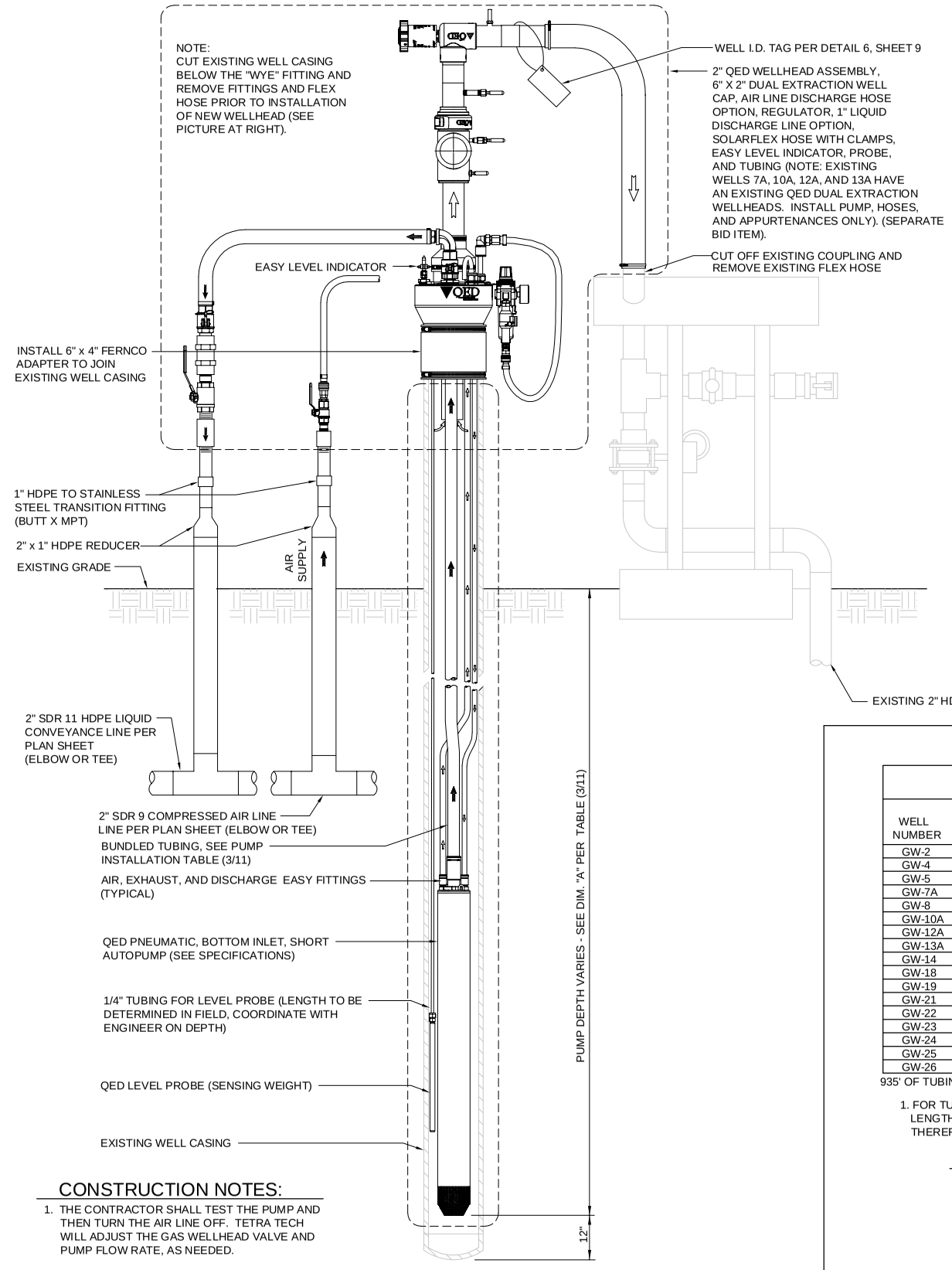
CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL TEST THE PUMP AND THEN TURN THE AIR LINE OFF. TETRA TECH WILL ADJUST THE GAS WELLHEAD VALVE AND PUMP FLOW RATE, AS NEEDED.
2. SEE DETAIL WELL DRILLING SCHEDULE, DETAIL 1, SHEET 8 FOR WELL DEPTHS.

TYPICAL DUAL EXTRACTION WELLHEAD/PUMP ASSEMBLY

NTS

1 / 11



CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL TEST THE PUMP AND THEN TURN THE AIR LINE OFF. TETRA TECH WILL ADJUST THE GAS WELLHEAD VALVE AND PUMP FLOW RATE, AS NEEDED.

TYPICAL EXISTING LFG WELL MODIFICATION DETAIL

NTS

2 / 11

TYPICAL EXISTING GAS EXTRACTION WELL

(EXISTING WELLS WILL HAVE THIS CONFIGURATION OR A QED WELLHEAD)

PUMP INSTALLATION TABLE

WELL NUMBER	APPROX. ELEVATION AT WELL	BOREHOLE DEPTH (FT.)	PUMP DEPTH DIM. "A"	NOTES
GW-2	4844	55.5	50	SIMILAR TO DETAIL 2/11
GW-4	4865	46.5	46	SIMILAR TO DETAIL 2/11
GW-5	4884	61.6	61.1	SIMILAR TO DETAIL 2/11
GW-7A	4841	62	61.5	EXISTING DUAL EXTRACTION WELLHEAD
GW-8	4851	59.3	58.8	SIMILAR TO DETAIL 2/11
GW-10A	4879	63	62.5	EXISTING DUAL EXTRACTION WELLHEAD
GW-12A	4832	70	69.5	EXISTING DUAL EXTRACTION WELLHEAD
GW-13A	4840	100	99.5	EXISTING DUAL EXTRACTION WELLHEAD
GW-14	4843	68.5	68.0	SIMILAR TO DETAIL 2/11
GW-18	4795	38.3	37.8	SIMILAR TO DETAIL 2/11
GW-19	4803	38.2	37.7	SIMILAR TO DETAIL 2/11
GW-21	4844	54	53.5	SEE DETAIL 1/11
GW-22	4853	74	73.5	SEE DETAIL 1/11
GW-23	4801	53	52.5	SEE DETAIL 1/11
GW-24	4810	44	43.5	SEE DETAIL 1/11
GW-25	4816	31	30.5	SEE DETAIL 1/11
GW-26	4811	29	28.5	SEE DETAIL 1/11

935' OF TUBING IS REQUIRED (ROUND UP TO 1,000 FEET OF BUNDLED TUBING, SEE NOTE 1)

1. FOR TUBING LENGTHS, IT IS ASSUMED THAT THE WELL HAS 3' STICK-UP AND THE LENGTH OF THE PUMP IS APPROXIMATELY 3' FROM THE BOTTOM OF THE BORING. THEREFORE, THE OVERALL TUBING LENGTH IS EQUAL TO THE BORING DEPTH.

PUMP INSTALLATION TABLE

NTS (WITH QED DUAL EXTRACTION WELLHEAD)

3 / 11

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811 Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

CITY OF BOZEMAN GALLATIN CO. MONTANA 1883

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

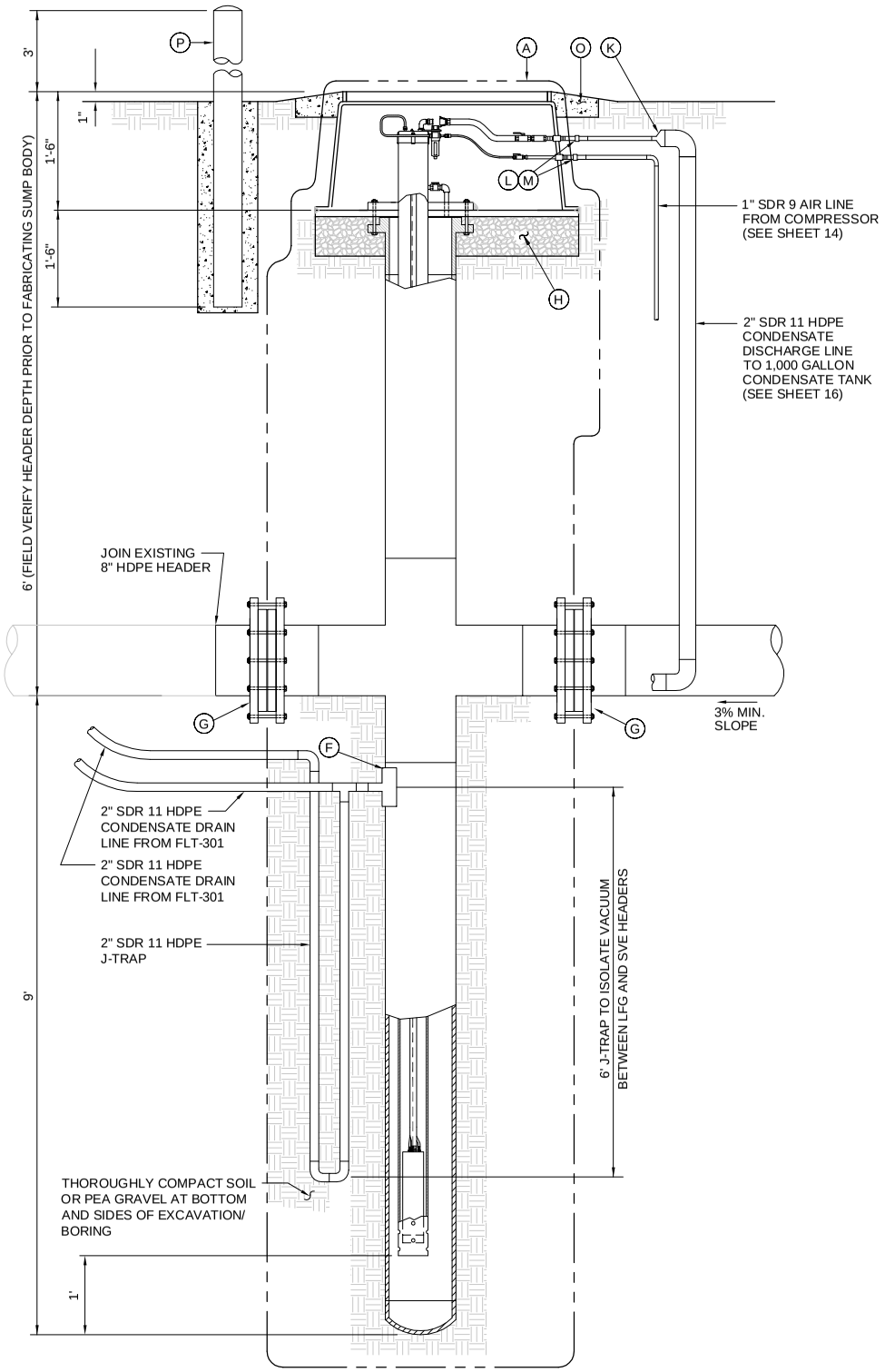
BOZEMAN LANDFILL

LFG/SVE/AI AND TREATMENT SYSTEM

LFG/SVE/AI SYSTEM DETAILS

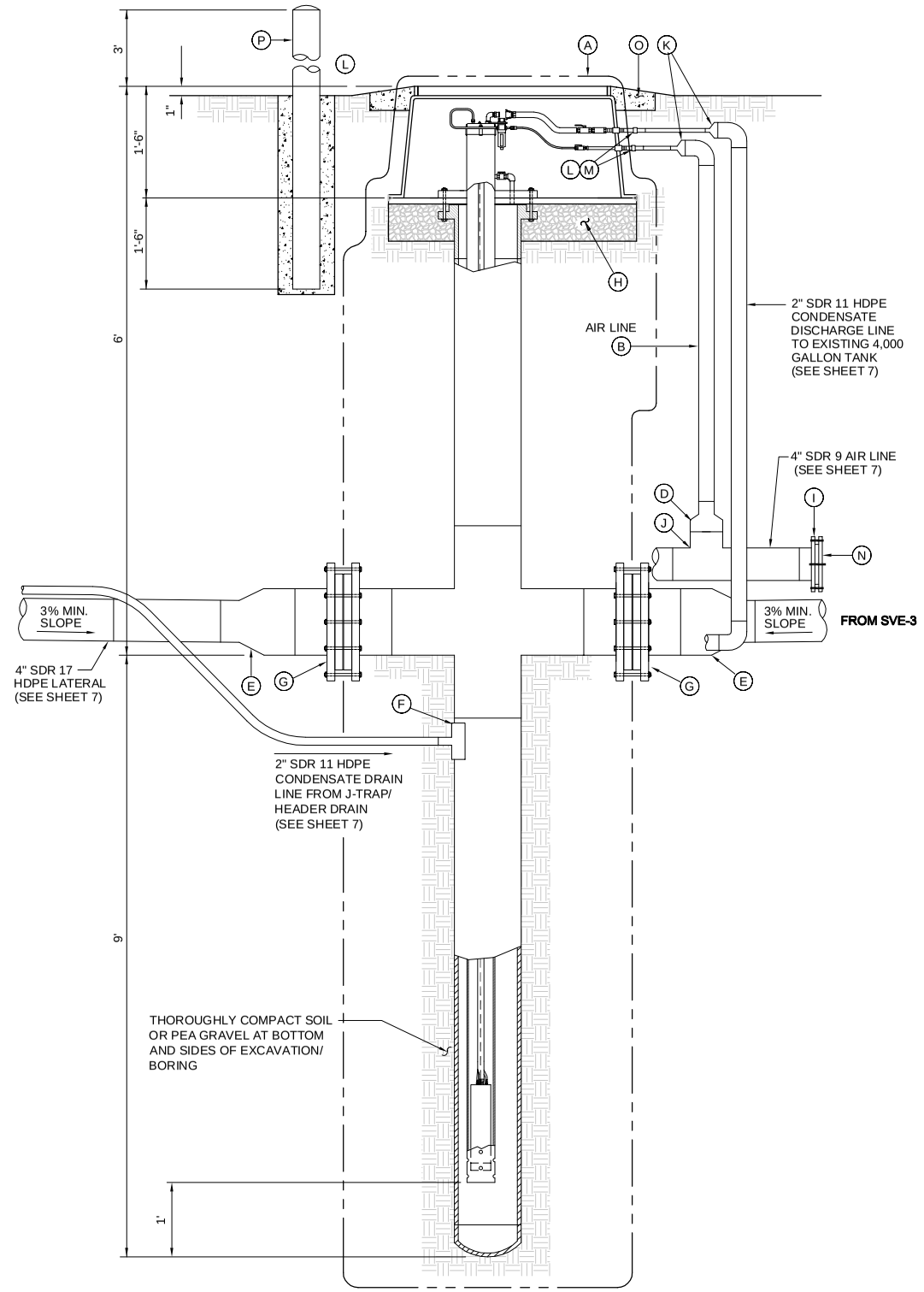
DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 11-85-0167GSD	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 11 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		

I:\dwg\Bozeman\Construction Drawings\11-85-0167GSD.dwg 7/02/15 14:40:07 scott.angus



CONDENSATE SUMP #1 DETAIL 1/12

NTS (SOME ITEMS ROTATED FOR CLARITY)



CONDENSATE SUMP #2 DETAIL 2/12

NTS (SOME ITEMS ROTATED FOR CLARITY)

SUMP CONSTRUCTION NOTES:

(A) PURCHASED SUMP ASSEMBLY: REAL ENVIRONMENTAL PRODUCTS SERIES 7000 CUSTOM SUMP ASSEMBLY, INCLUDING THE FOLLOWING:
- -HDPE VAULT (17" WIDE X 30" LONG X 18" HIGH)
- -QED FILTER/REGULATOR AND PULSE COUNTER ASSEMBLY (MOUNT TO BRACKET)
- -EYE BOLT (MOUNT CABLE TO SUPPORT PUMP)
- -8" SDR 17 HDPE PIPE (SUMP BODY)
- -8" HDPE SDR 17 CROSS WITH FLANGE ASSEMBLIES
- -QED PNEUMATIC AP4B SHORT BODY PUMP
- -8" SDR 17 HDPE FLANGE ADAPTER, SS BACK-UP RING & HARDWARE
- -8" SDR 17 HDPE BLIND FLANGE (MODIFIED FOR PUMP WELLHEAD ASSEMBLY)
- -3/8" & 1" BALL VALVES FOR AIR & CONDENSATE LINES
- -1/8" SS SUPPORT CABLE OR ROPE & FITTINGS
- -4" SDR 17 HDPE INTERNAL ISOLATION WELL
- -QUICK RELEASE FITTINGS FOR AIR & CONDENSATE LINES
- -HOSES AND/OR JACKETED TUBING LINES FOR LIQUID, AIR, AND VENT LINES
- -BALANCE LINE CONNECTED TO SUMP AND ISOLATION WELL

CONTRACTOR INSTALLED ITEMS

(B) INSTALL 2" SDR 9 HDPE COMPRESSED AIR LINE AND FITTINGS
(C) (DELETED)
(D) INSTALL 4" x 2" HDPE REDUCER
(E) INSTALL 8" x 4" HDPE REDUCER
(F) INSTALL 8" x 2" HDPE SADDLE
(G) INSTALL 8" SDR 17 HDPE FLANGE ADAPTER, SS BACK-UP RING AND HARDWARE
(H) INSTALL 6" OF GRAVEL BASE BELOW VAULT
(I) INSTALL 4" HDPE FLANGE ADAPTER, SS BACK-UP RING AND HARDWARE
(J) INSTALL 4" SDR 9 HDPE TEE
(K) INSTALL 2" x 1" HDPE REDUCER
(L) INSTALL 1" HDPE TO SS TRANSITION FITTING
(M) INSTALL STAINLESS STEEL FITTINGS, AS NEEDED, TO JOIN SUMP ASSEMBLY
(N) INSTALL 4" HDPE BLIND FLANGE
(O) INSTALL 12" WIDE X 4" THICK CONCRETE APRON, TAPER TO DRAIN AWAY FROM VAULT
(P) INSTALL 6" DIAMETER STEEL BOLLARD, PAINTED BRIGHT YELLOW, INSTALLED IN 12" DIAMETER CONCRETE FOOTING x 3' DEEP.

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811 Utilities Underground Location Center (UULC) Call 1-800-424-5555 (or 811)

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL

LFG/SVE/AI AND TREATMENT SYSTEM

CONDENSATE SUMP DETAILS

DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 12-85-0168GSD	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 12 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		

I:\dwg\Bozeman\Construction Drawings\12-85-0168GSD.dwg 5/29/15 14:21:05 scott.angus

T-2
CONDENSATE HOLDING TANK
MFR: POLY PROCESSING, OR EQUIVALENT (CORE-ROSION PRODUCTS)
MODEL: 1101150, SINGLE WALL, FULL DRAIN TANK
MATERIAL: POLYETHYLENE
SIZE: 1,150 GALLON, 64'Ø x 99"
ACCESSORIES: LADDER, SEISMIC RESTRAINT SYSTEM, 4-2" FITTINGS ON TOP

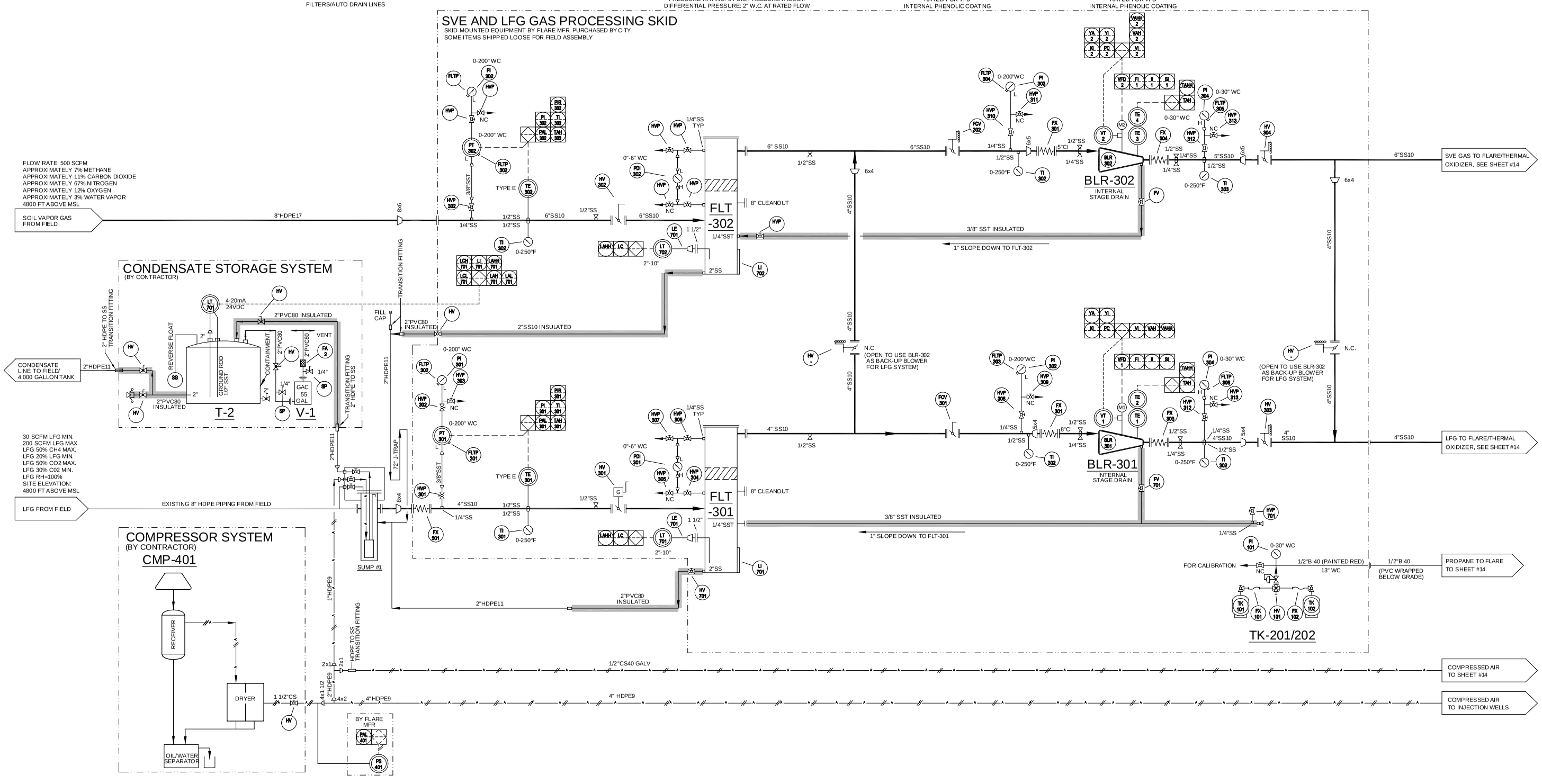
CMP-401
AIR COMPRESSOR SYSTEM
MFR: INGERSOLL RAND, OR EQUIVALENT
MODEL NO.: ROTARY SCREW 50HP SIERRA OIL-FREE 2-ROTARY SCREW COMPRESSORS
CAPACITY: 186 CFM @ 125 PSI
DRYER: PER MFR.
OIL/WATER SEPARATOR
FILTERS/AUTO DRAIN LINES

FLT-301
FUEL FILTER/KNOCKOUT VESSEL
MFR: TO BE DTERMINED
MATERIAL: 304L STAINLESS STEEL
FLOW RATE: 1,500 SCFM MAXIMUM/ ___ SCFM MINIMUM
99% REMOVAL OF 6 MICRON OR GREATER
PRESSURE RATING: 5 PSIG PRESSURE/VACUUM
DIFFERENTIAL PRESSURE: 2" W.C. AT RATED FLOW

BLR-301
CENTRIFUGAL BLOWER
MFR: HOUSTON SERVICE INDUSTRIES, INC. (ATLAS COPCO) OR EQUIVALENT
MODEL No.: 5103
PRESSURE: 85 W.C. TOTAL (-70" W.C. INLET/15" W.C. OUTLET)
MOTOR: TEFC 20 HP/460V/3Ø/60Hz
RATED FOR VFD
INTERNAL PHENOLIC COATING

BLR-302
CENTRIFUGAL BLOWER
MFR: HOUSTON SERVICE INDUSTRIES, INC. (ATLAS COPCO) OR EQUIVALENT
MODEL No.: 5103
PRESSURE: 85 W.C. TOTAL (-70" W.C. INLET/15" W.C. OUTLET)
MOTOR: TEFC 25 HP/460V/3Ø/60Hz
RATED FOR VFD
INTERNAL PHENOLIC COATING

TK-201/202
PILOT PROPANE BOTTLES
MFR: WORTHINGTON CYLINDERS OR EQUIVALENT
SIZE: 5 GALLON/20lb



NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811
Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

CITY OF BOZEMAN GALLATIN CO. MONTANA 1883

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL
LFG/SVE/AI AND TREATMENT SYSTEM
PIPING & INSTRUMENTATION DIAGRAM

DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 13-83-0023PID	
CHECKED BY : M. PEARSON	DATE : 6-2015		
APPROVED BY : L. CAWLFIELD	DATE : 6-2015	SHEET 13 OF 23	

I:\dwg\Bozeman\Construction Drawings\13-83-0023PID.dwg 6/29/15 16:23:11 scott.angus

FE/FT-301

FLOW METER AND TRANSMITTER
MFR: VERIS OR APPROVED EQUIVALENT
TYPE: AVERAGING DIFFERENTIAL PRESSURE (VERABAR)
FLOW: 0 TO 200 SCFM OF LFG
OUTPUT: 4-20mA
POWER: 24VDC
RATED: CLASS 1, DIV 2, GROUP D

FE/FT-302

FLOW METER AND TRANSMITTER
MFR: VERIS OR APPROVED EQUIVALENT
TYPE: AVERAGING DIFFERENTIAL PRESSURE (VERABAR)
FLOW: 0 TO 500 SCFM OF LFG
OUTPUT: 4-20mA
POWER: 24VDC
RATED: CLASS 1, DIV 2, GROUP D

TSE-301

FLAME ARRESTER
MFR: VAREC, OR EQUIVALENT
HOUSING: ALUMINUM
ELEMENT: ALUMINUM
TYPE: HORIZONTAL, FLANGED
PORTS: 1/2" PRESSURE & DRAIN (4)

TSE-302

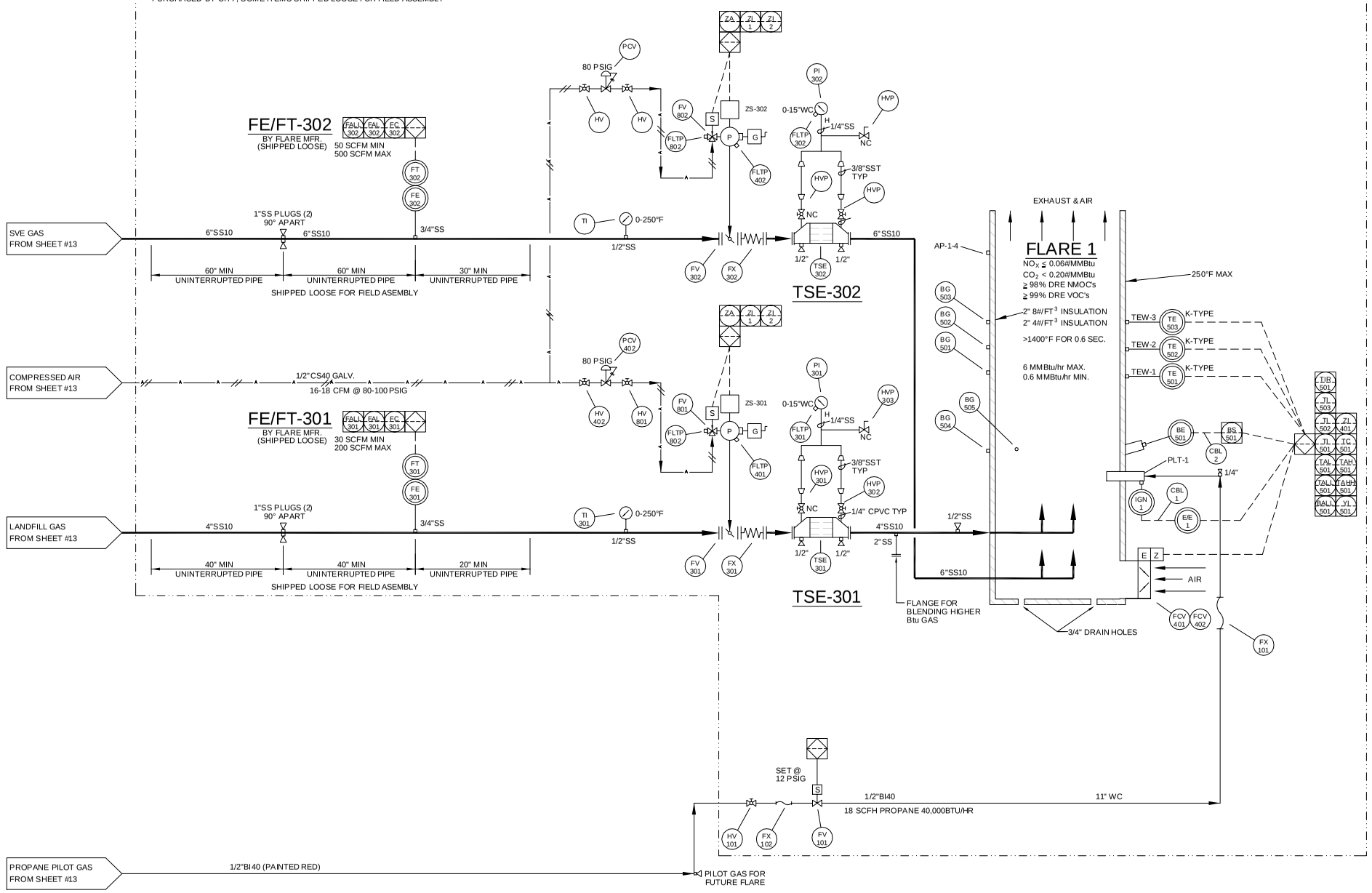
FLAME ARRESTER
MFR: VAREC, OR EQUIVALENT
HOUSING: ALUMINUM
ELEMENT: ALUMINUM
TYPE: HORIZONTAL, FLANGED
PORTS: 1/2" PRESSURE & DRAIN (4)

FLARE 1

ENCLOSED GROUND FLARE/THERMAL OXIDIZER
MFR: TO BE DETERMINED
0.6 MMBTU/HR TO 6 MMBTU/HR
SIZE: 54"Ø x 23' O.A.H.
2 AUTOMATED LOUVERS
4 TEST PORTS
5 VIEW PORTS
HONEYWELL UV SELF-CHECKING FLAME SAFEGUARD
HONEYWELL PILOT IGNITION TRANSFORMER

FLARE/THERMAL OXIDIZER

PURCHASED BY CITY, SOME ITEMS SHIPPED LOOSE FOR FIELD ASSEMBLY



NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL

LFG/SVE/AI AND TREATMENT SYSTEM

PIPING & INSTRUMENTATION DIAGRAM

DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 14-83-0024PID	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 14 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		

I:\dwg\Bozeman\Construction Drawings\14-83-0024PID.dwg 6/26/15 16:19:17 scott.angus

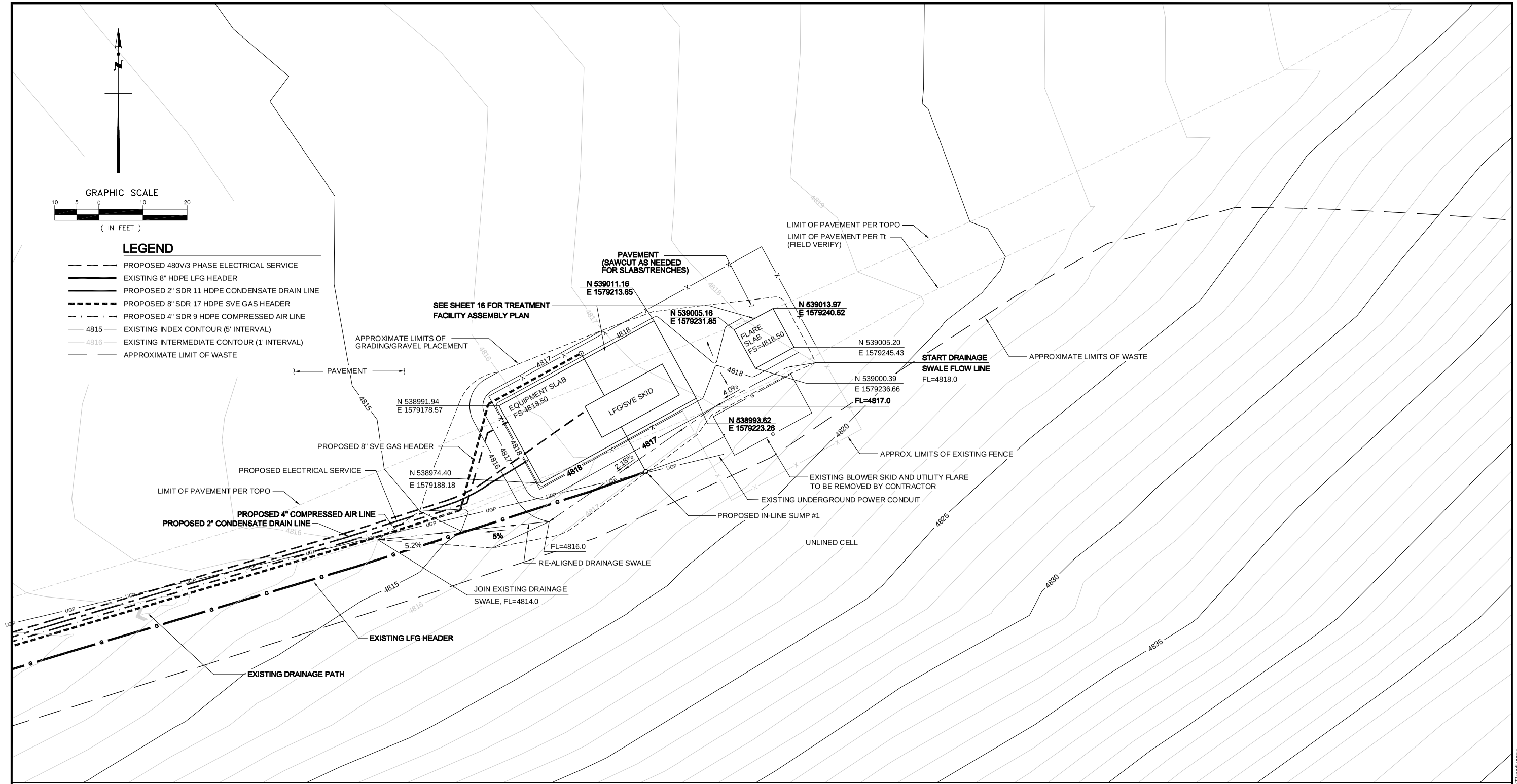
GRAPHIC SCALE

10 5 0 10 20

(IN FEET)

LEGEND

- PROPOSED 480V/3 PHASE ELECTRICAL SERVICE
- EXISTING 8" HDPE LFG HEADER
- PROPOSED 2" SDR 11 HDPE CONDENSATE DRAIN LINE
- PROPOSED 8" SDR 17 HDPE SVE GAS HEADER
- PROPOSED 4" SDR 9 HDPE COMPRESSED AIR LINE
- 4815 EXISTING INDEX CONTOUR (5' INTERVAL)
- 4816 EXISTING INTERMEDIATE CONTOUR (1' INTERVAL)
- APPROXIMATE LIMIT OF WASTE



TREATMENT FACILITY SITE/GRADING PLAN

SCALE: 1"=10'

1/15

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811 Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

CITY OF BOZEMAN GALLATIN CO. MONTANA 1883

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

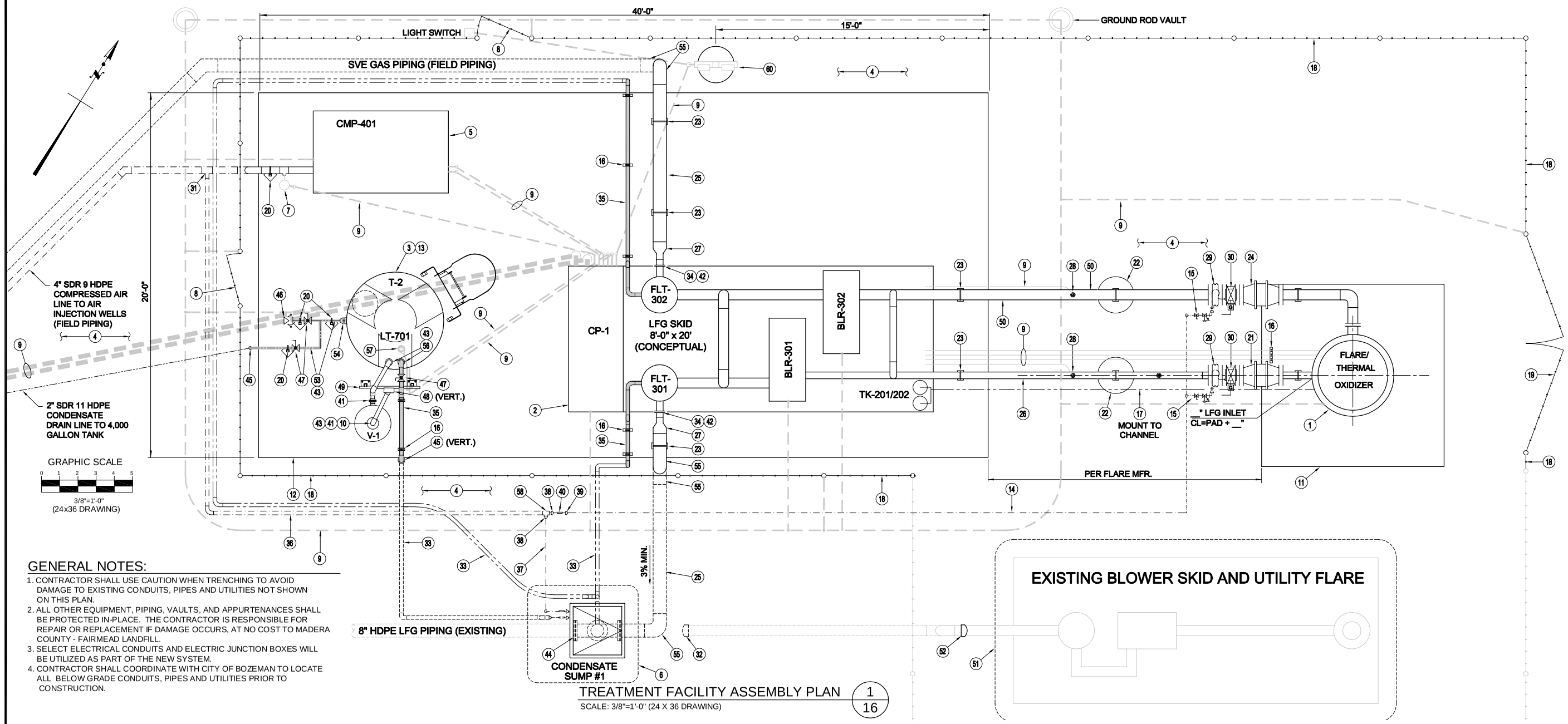
BOZEMAN LANDFILL

LFG/SVE/AI AND TREATMENT SYSTEM

TREATMENT FACILITY SITE/GRADING PLAN

DESIGNED BY : S. ANGUS/K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 15-10-0073SITE	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 15 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		

I:\dwg\Bozeman\Construction Drawings\15-10-0073SITE.dwg 5/27/15 14:40:22 scott.angus



GENERAL NOTES:

1. CONTRACTOR SHALL USE CAUTION WHEN TRENCHING TO AVOID DAMAGE TO EXISTING CONDUITS, PIPES AND UTILITIES NOT SHOWN ON THIS PLAN.
2. ALL OTHER EQUIPMENT, PIPING, VAULTS, AND APPURTENANCES SHALL BE PROTECTED IN-PLACE. THE CONTRACTOR IS RESPONSIBLE FOR REPAIR OR REPLACEMENT IF DAMAGE OCCURS, AT NO COST TO MADERA COUNTY - FAIRMEAD LANDFILL.
3. SELECT ELECTRICAL CONDUITS AND ELECTRIC JUNCTION BOXES WILL BE UTILIZED AS PART OF THE NEW SYSTEM.
4. CONTRACTOR SHALL COORDINATE WITH CITY OF BOZEMAN TO LOCATE ALL BELOW GRADE CONDUITS, PIPES AND UTILITIES PRIOR TO CONSTRUCTION.

TREATMENT FACILITY ASSEMBLY PLAN

1
16

SCALE: 3/8"=1'-0" (24 X 36 DRAWING)

TREATMENT FACILITY CONSTRUCTION NOTES:

1. INSTALL/ANCHOR FLARE/THERMAL OXIDIZER TO SLAB PER MANUFACTURER
2. INSTALL GAS HANDLING SYSTEM SKID, ANCHOR TO SLAB PER MANUFACTURER
3. INSTALL 1,150 GALLON POLYETHYLENE CONDENSATE HOLDING TANK, SEISMIC RESTRAINT SYSTEM, LADDER, AND APPURTENANCES (T-2), ANCHOR TO SLAB PER MFR.
4. INSTALL GRAVEL BASE LAYER, GRADE AREA TO DRAIN PER SHEET 15
5. INSTALL AIR COMPRESSOR SKID ASSEMBLY (CMP-401) AND APPURTENANCES, ANCHOR TO SLAB WITH CONCRETE WEDGE ANCHORS
6. INSTALL CONDENSATE SUMP PER DETAIL 1, SHEET 12
7. INSTALL PRESSURE SWITCH
8. INSTALL 3' WIDE CHAIN LINK ACCESS GATE WITH LOCKING MECHANISM
9. ELECTRICAL CONDUIT OR GROUND GRID, SEE SHEET 22
10. INSTALL 55 GALLON DRUM GRANULAR ACTIVATED CARBON VENT (V-1)
11. INSTALL FLARE/THERMAL OXIDIZER STRUCTURAL SLAB PER DETAIL 2, SHEET 17
12. INSTALL EQUIPMENT SLAB PER DETAIL 1, SHEET 17
13. HEAT TRACE CONDENSATE TANK
14. INSTALL 1/2" C.S. AIR LINE AND FITTINGS, GALVANIZED, PVC WRAPPED BELOW GRADE
15. CONNECT AIR LINE, VALVE, AND REGULATOR TO AUTOMATIC SHUTDOWN VALVE
16. INSTALL PIPE SUPPORT PER DETAIL 1, SHEET 19
17. INSTALL 1/2" Ø B.I. PROPANE LINE & FITTINGS (PAINT RED)
18. INSTALL 6' HIGH CHAIN LINK FENCE, FENCE POSTS, AND FOOTINGS PER CITY STDS
19. INSTALL 12' WIDE SWING GATE PER CITY STANDARDS
20. INSTALL PIPE SUPPORT PER DETAIL 3, SHEET 19
21. INSTALL 4" FLAME ARRESTER (TSE-301) (SUPPLIED BY FLARE MFR.)
22. INSTALL PIPE SUPPORT PER DETAIL 6, SHEET 19
23. INSTALL PIPE SUPPORT PER DETAIL 5, SHEET 19
24. INSTALL 6" FLAME ARRESTER (TSE-302) (SUPPLIED BY FLARE MFR.)
25. INSTALL 8" SDR 17 HDPE PIPE
26. INSTALL 4" SCH 10S STAINLESS STEEL PIPE SPOOL (SUPPLIED BY FLARE MFR.)
27. INSTALL 8" x 4" HDPE REDUCER
28. INSTALL FLOW ELEMENT/TRANSMITTER (FE/FT-301/302) (SUPPLIED BY FLARE MFR.)
29. INSTALL EXPANSION JOINT FITTING (SUPPLIED BY FLARE MFR.)
30. INSTALL SHUTDOWN VALVE WITH GEAR OPERATOR (SUPPLIED BY FLARE MFR .)
31. INSTALL 4" x 2" HDPE TEE, SDR 9
32. INSTALL 8" PVC CAP, LAG SCREW TO EXISTING PIPE
33. INSTALL 2" SDR 11 HDPE PIPE AND FITTINGS, BELOW GRADE, PER DETAIL 7, SHEET 9
34. INSTALL 4" SDR 17 HDPE PIPE AND FITTINGS
35. INSTALL 2" SCH 80 PVC PIPE AND FITTINGS, ABOVE GRADE
36. INSTALL 2" SDR 9 HDPE PIPE AND FITTINGS, BELOW GRADE, PER DETAIL 7, SHEET 9
37. INSTALL 1" SDR 9 HDPE PIPE AND FITTINGS, BELOW GRADE, PER DETAIL 7, SHEET 9
38. INSTALL 2" X 1" HDPE REDUCER
39. INSTALL 1" X 1/2" FNPT REDUCER COUPLING, C.S., GALVANIZED
40. INSTALL 1" HDPE TO 1" SST (MNPT) TRANSITION FITTING
41. INSTALL 2" PVC UNION
42. INSTALL 4" HDPE FLANGE ADAPTER, STAINLESS BACK-UP RING, AND HARDWARE
43. INSTALL 2" SCH 80 PVC PIPE & FITTINGS
44. JOIN EXISTING LINE
45. INSTALL 2" HDPE TO SS TRANSITION FITTING
46. INSTALL 2" PVC CAMLOCK FITTING & PLUG
47. INSTALL 2" TRU-UNION BALL VALVE
48. INSTALL 2" SS FLAME CHECK
49. INSTALL PIPE SUPPORT RACK PER DETAIL 8, SHEET 19
50. INSTALL 6" SCH 10S STAINLESS STEEL PIPE SPOOL (SUPPLIED BY FLARE MFR.)
51. REMOVE AND DISPOSE OF EXISTING BLOWER SKID AND UTILITY FLARE
52. CUT AND CAP EXISTING LFG INLET PIPING
53. INSTALL INSULATION AND HEAT TRACE
54. INSTALL 3" PVC FLANGE AND 3" X 2" PVC REDUCER
55. INSTALL 8" HDPE ELBOW
56. INSTALL 2" PVC MALE ADAPTER
57. INSTALL LEVEL TRANSMITTER, RF CAPACITANCE, ROBERTSHAW OR EQUAL
58. INSTALL 2" HDPE TEE, SDR 9
59. PROTECT IN-PLACE
60. INSTALL FLOOD LIGHT, POLE, SWITCH, AND FOUNDATION PER DETAIL 9, SHEET 19

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811 Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

CITY OF BOZEMAN
GALLATIN CO. MONTANA
1883

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

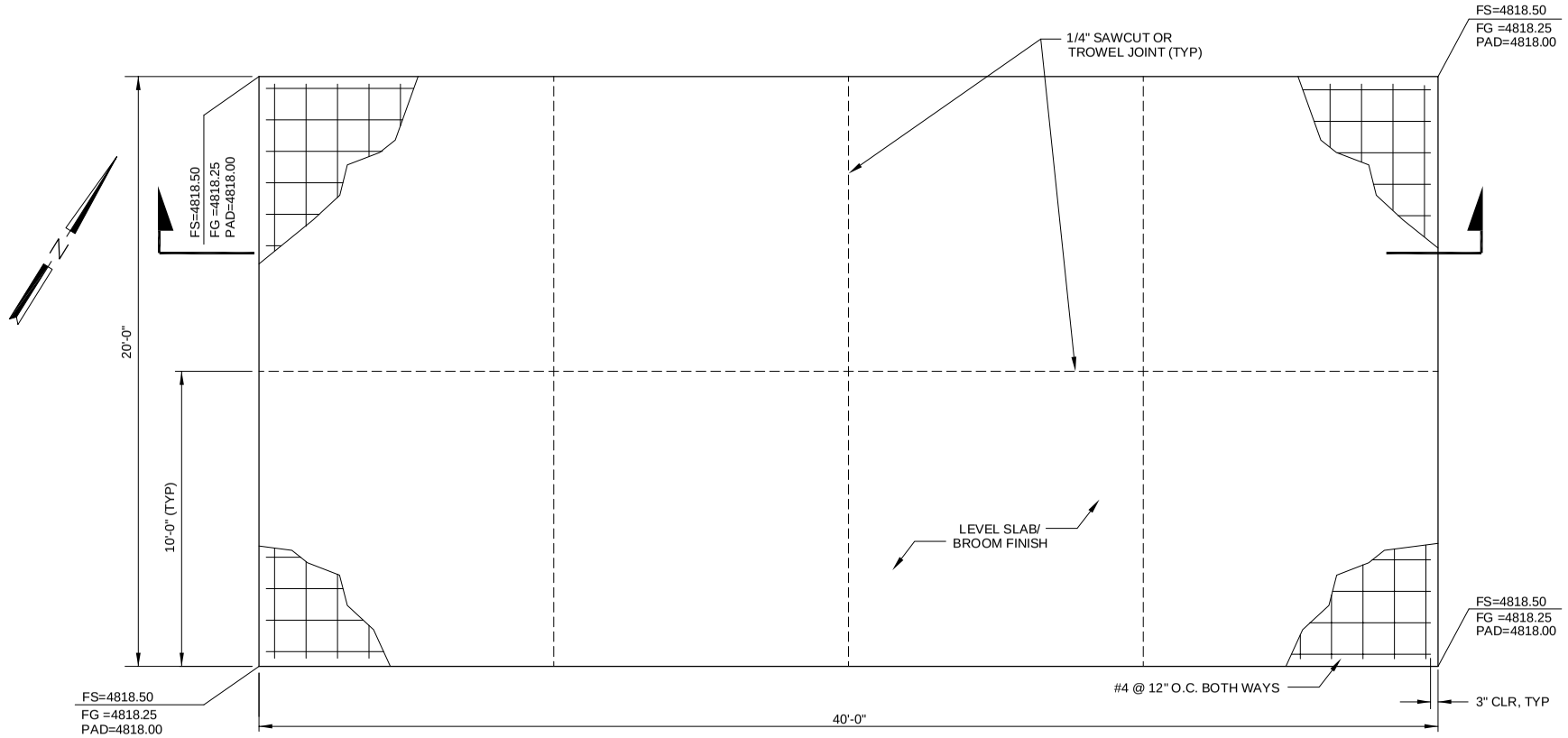
BOZEMAN LANDFILL

LFG/SVE/AI AND TREATMENT SYSTEM

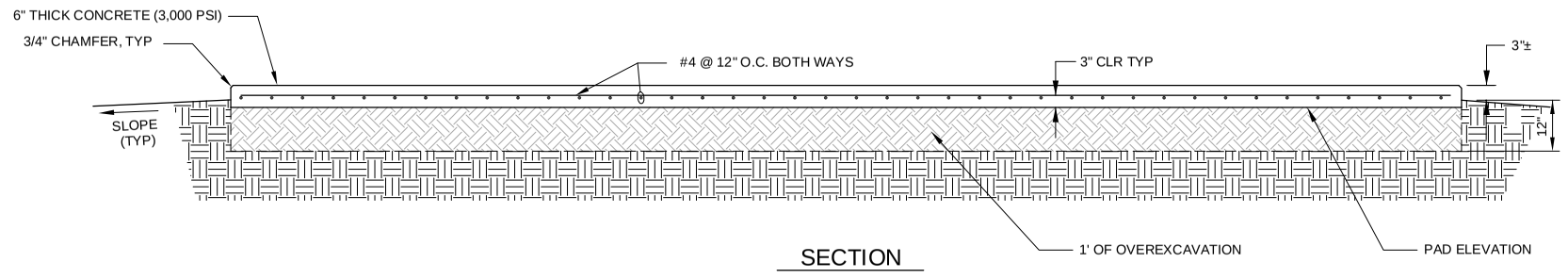
TREATMENT FACILITY ASSEMBLY PLAN

DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 16-80-0034MECH	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 16 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		

I:\dwg\Bozeman\Construction Drawings\16-80-0034MECH.dwg 6/09/15 15:33:28 scott.angus



PLAN

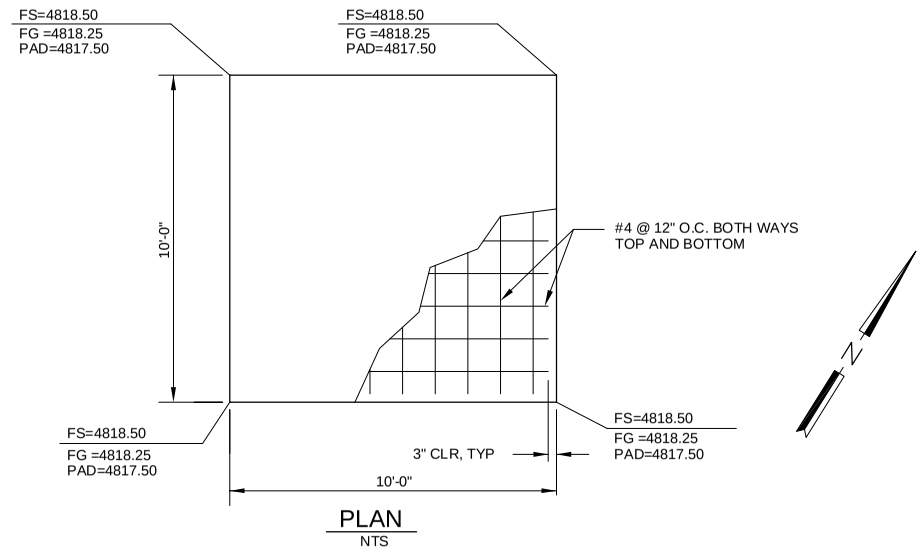


SECTION

EQUIPMENT STRUCTURAL PLAN AND SECTION

NTS

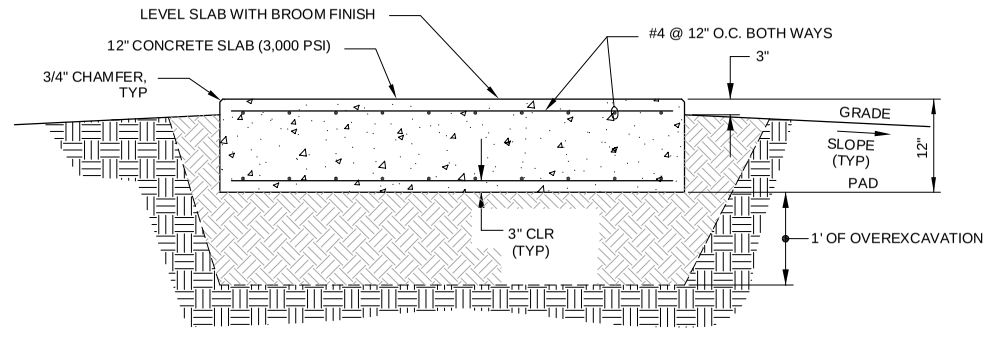
1
17



PLAN

NTS

FLARE MANUFACTURER TO VERIFY STRUCTURAL SLAB AND ANCHORING IS PROPERLY SIZED



SECTION

NTS

FLARE STRUCTURAL PLAN AND SECTION

NTS (ALLOW 28 DAYS MINIMUM TO CURE SLAB)

2
17

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

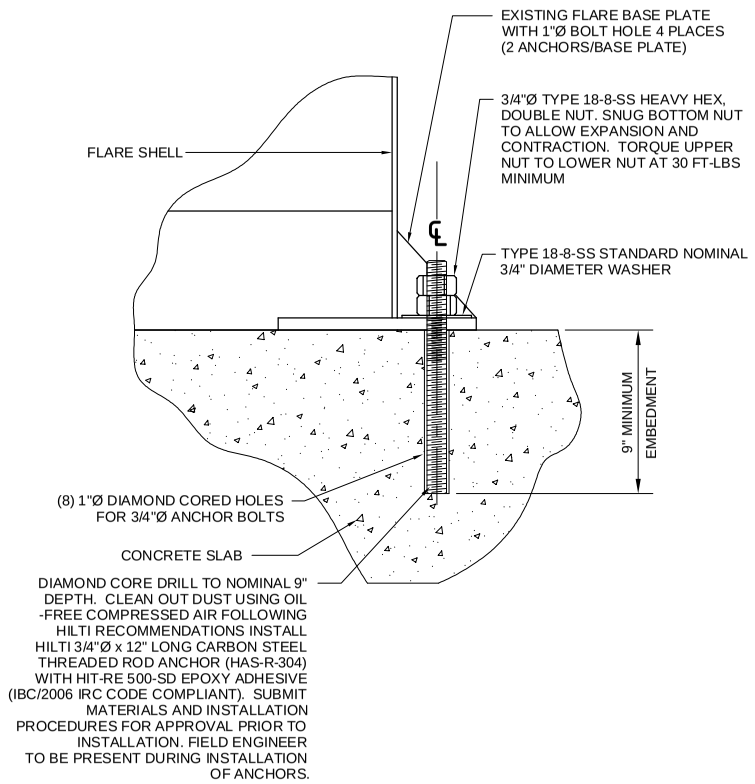
TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL

LFG/SVE/AI AND TREATMENT SYSTEM

STRUCTURAL PLANS AND SECTIONS

DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN	
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 17-70-0017CONC
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 17 OF 23
APPROVED BY : L. CAWLFIELD	DATE : 6-2015	



FLARE MANUFACTURER TO PROVIDE DETAILS
AND CALCULATIONS FOR ANCHORING OF FLARE

TYPICAL FLARE ANCHOR BOLT DETAIL — 1/18
NTS (TYPICAL _ PLACES)

STRUCTURAL SPECS:

CONCRETE:

1. PORTLAND CEMENT CONCRETE SHALL BE 3000 PSI TYPE I/II CONFORMING TO ASTM C150 UNLESS OTHERWISE NOTED.
2. CONCRETE SHALL HAVE NORMAL WEIGHT (145 pcf) UNLESS OTHERWISE NOTED.
3. REINFORCEMENT, STEEL ANCHOR BOLTS AND OTHER EMBEDDED ITEMS SHALL BE SECURED IN PLACE AND SHALL HAVE SPECIAL INSPECTION.
4. SPECIAL INSPECTION IS REQUIRED FOR CONCRETE PLACEMENT.
5. EXPOSED EDGES SHALL BE CHAMFERED 3/4-INCH UNLESS OTHERWISE NOTED.
6. THE CONTRACTOR SHALL COORDINATE WITH OTHER DISCIPLINES FOR PIPES/ CONDUITS NOT SHOWN ON THE STRUCTURAL DRAWINGS.

STRUCTURAL AND MISC. METALWORK:

1. REINFORCEMENT STEEL SHALL BE A615 GRADE 60 DEFORMED BARS UNLESS NOTED OTHERWISE.
2. REINFORCEMENT STEEL SHALL HAVE 3-INCHES OF CONCRETE COVER UNLESS NOTED OTHERWISE.
3. ANCHOR BOLTS SHALL BE INSTALLED UTILIZING EPOXY ANCHORS, RAWL "FOIL-FAST" TYPE OR APPROVED EQUAL FOR MOUNTING MAJOR EQUIPMENT, PIPE SUPPORTS AND SMALL EQUIPMENT SHALL BE INSTALLED UTILIZING CONCRETE WEDGE ANCHORS, RAWL-STUD ANCHOR OR APPROVED EQUAL.
4. ANCHOR BOLTS AND ASSEMBLY FOR EQUIPMENT AND MACHINERY SHALL BE INSTALLED WITH SELF LOCKING NUTS OR WITH LOCK WASHERS AND PLAIN NUTS AND SHALL BE STAINLESS STEEL.

MANUFACTURER'S DESIGN DATA:

FLARE
DEAD LOAD = XX,XXX LBS
SHEAR @ BASE = X.XX KIPS
MOMENT @ BASE = XXX.X KIP-FT
REFERENCE UBC 1994

GROUT:

GROUT SHALL BE NON-SHRINK GROUT UNLESS OTHERWISE NOTED. USE SIKAGROUT 212 (LARR 24764) BY SIKA CORPORATION OR APPROVED EQUAL.

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811 Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

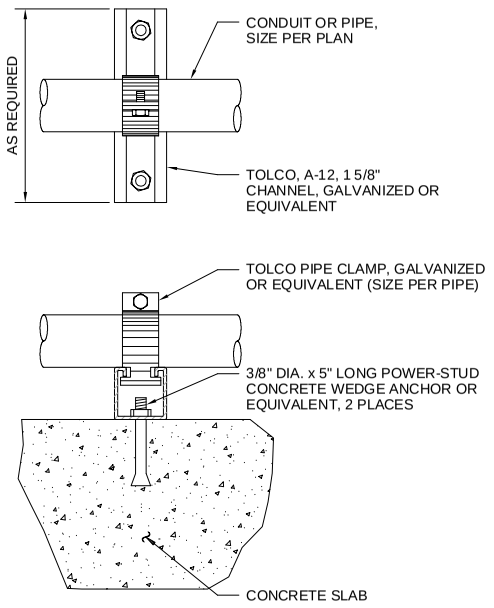
CITY OF BOZEMAN 1883 GALLATIN CO. MONTANA

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL
LFG/SVE/AI AND TREATMENT SYSTEM
STRUCTURAL DETAILS AND NOTES

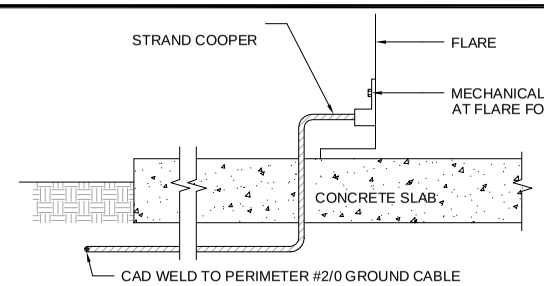
DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 18-70-0018CONC	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 18 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		

I:\dwg\Bozeman\Construction Drawings\18-70-0018CONC.dwg 6/29/15 16:30:07 scott.angus



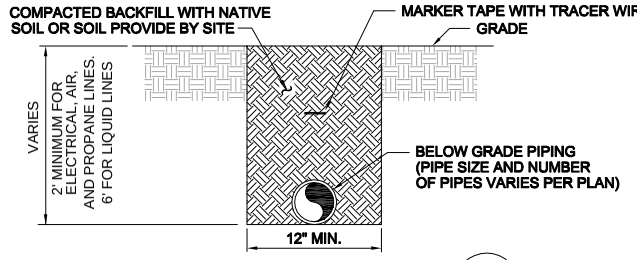
CONDUIT AND SMALL PIPE MOUNTING DETAIL

NTS (LOCATE AT 5'-0" O.C. AND ON BOTH SIDES OF ALL PIPE BENDS) — 1 / 19



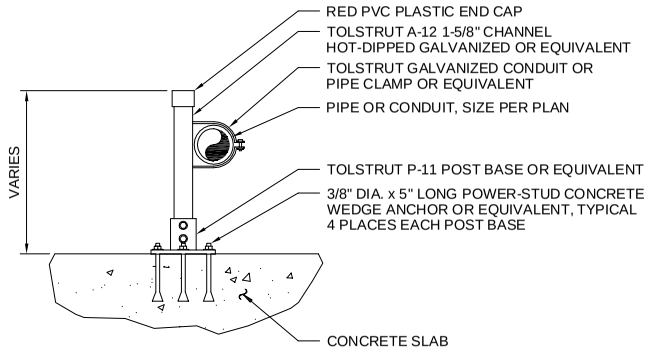
FLARE GROUND DETAIL

NTS — 2 / 19



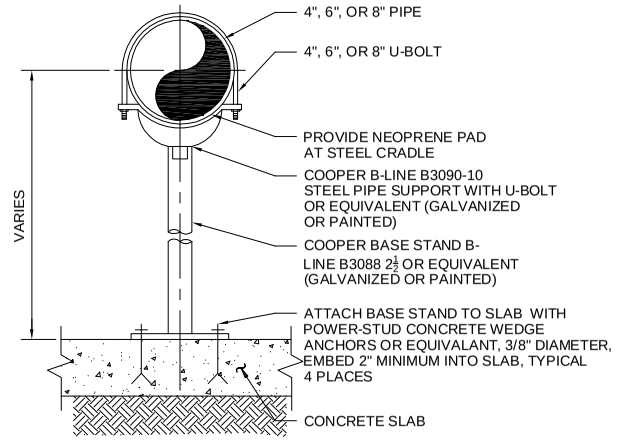
TYPICAL TRENCH SECTION

NTS — 4 / 19



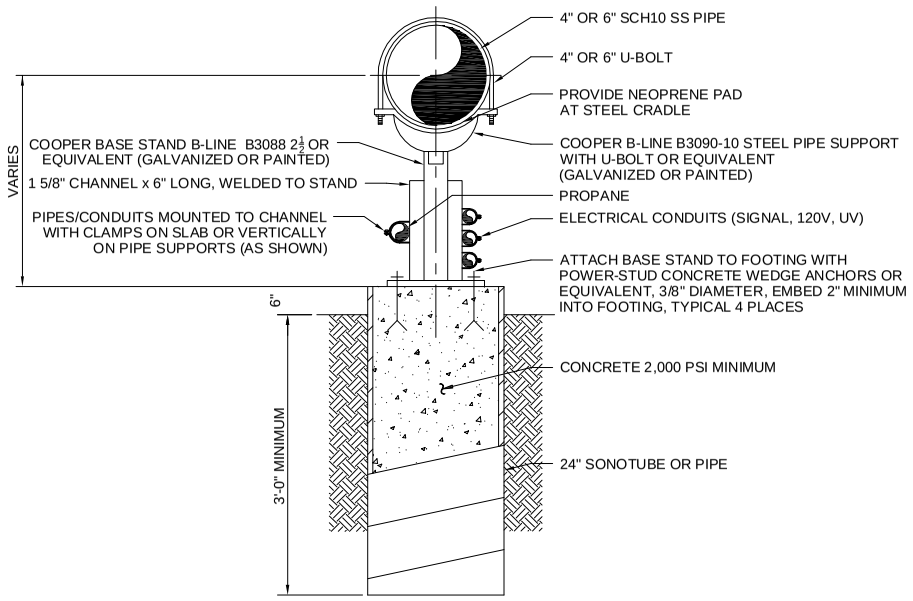
PIPE SUPPORT DETAIL

NTS — 3 / 19



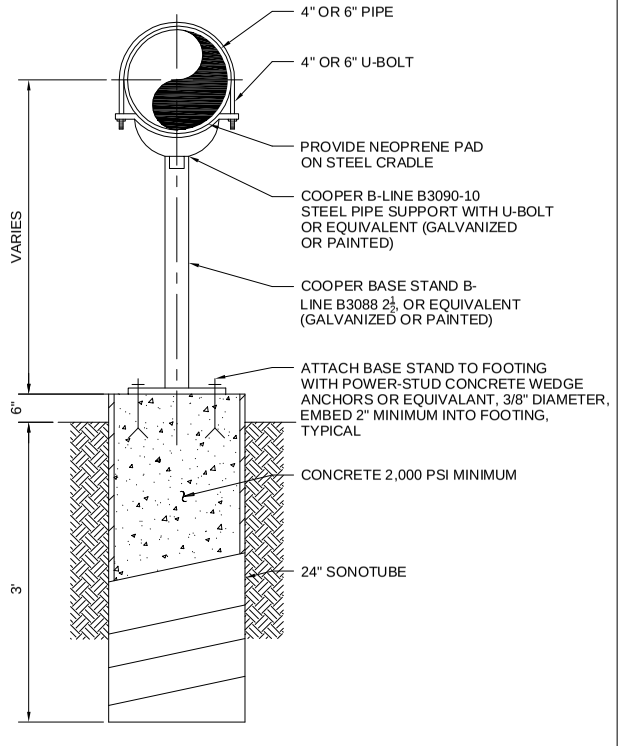
PIPE SUPPORT DETAIL ON SLAB

NTS — 5 / 19



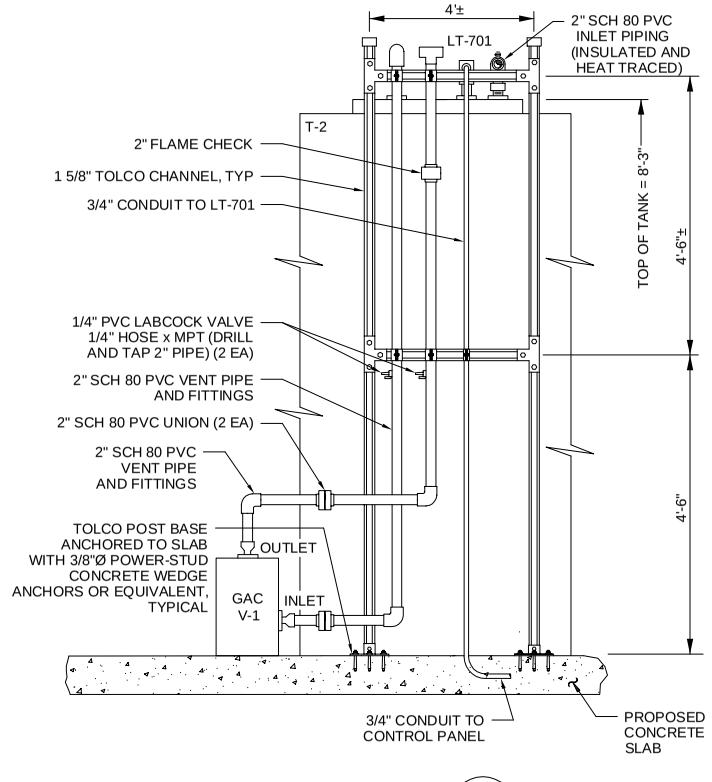
PIPE SUPPORT DETAIL

NTS
(BETWEEN SKID AND FLARE) — 6 / 19



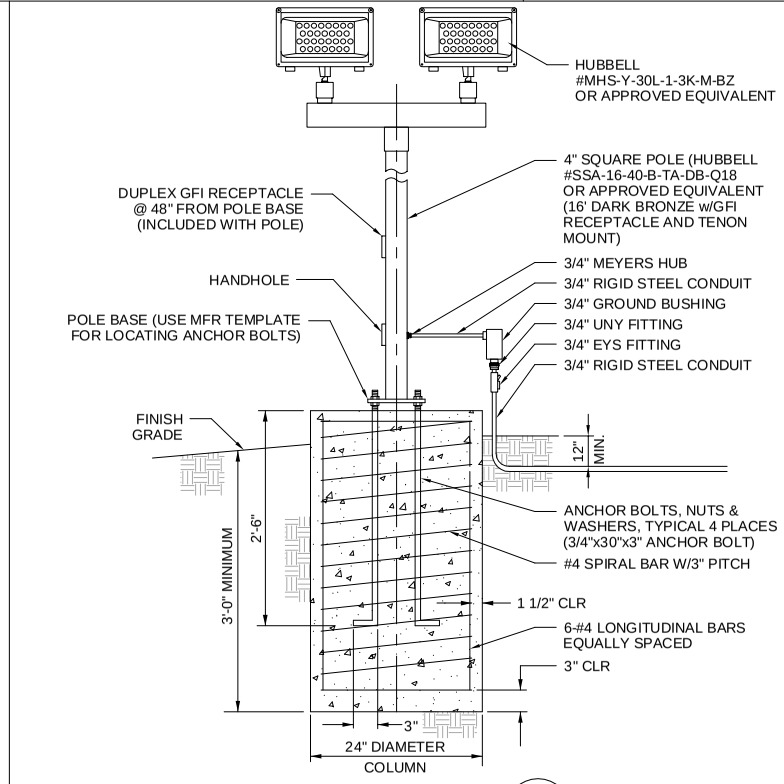
PIPE SUPPORT DETAIL WITH FOOTING

NTS — 7 / 19



PIPE RACK DETAIL

NTS — 8 / 19



LIGHT POLE DETAIL

NTS — 9 / 19

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

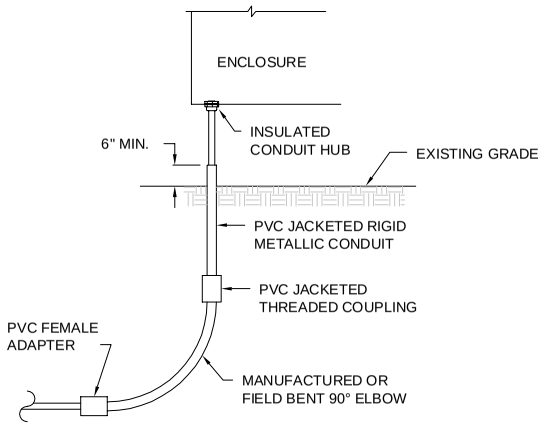
BOZEMAN LANDFILL

LFG/SVE/AI AND TREATMENT SYSTEM

TREATMENT FACILITY DETAILS

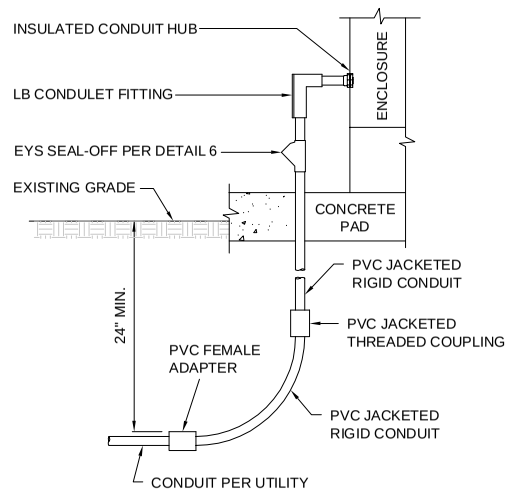
DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 19-80-0038MECH	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 19 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		

I:\dwg\Bozeman\Construction Drawings\19-80-0038MECH.dwg 7/07/15 16:03:26 scott.angus



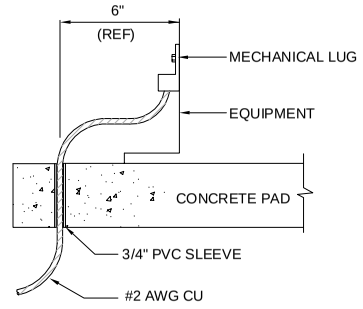
UNDERGROUND CONDUIT INTO AN ABOVE GRADE ENCLOSURE DETAIL 1/20

NTS



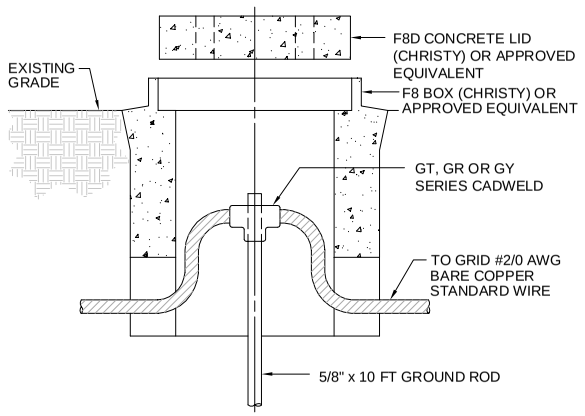
UNDERGROUND CONDUIT TRANSITION INTO AN ENCLOSURE DETAILS 2/20

NTS



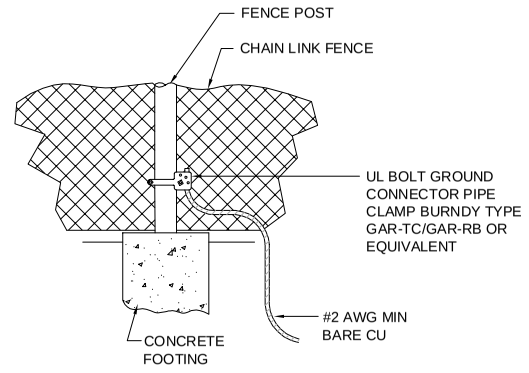
GROUND RING CONCRETE PENETRATION DETAIL 3/20

NTS



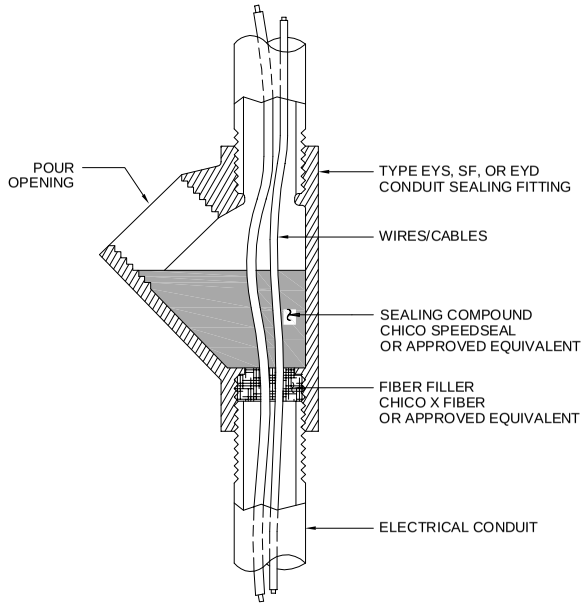
GROUND ROD DETAIL 4/20

NTS



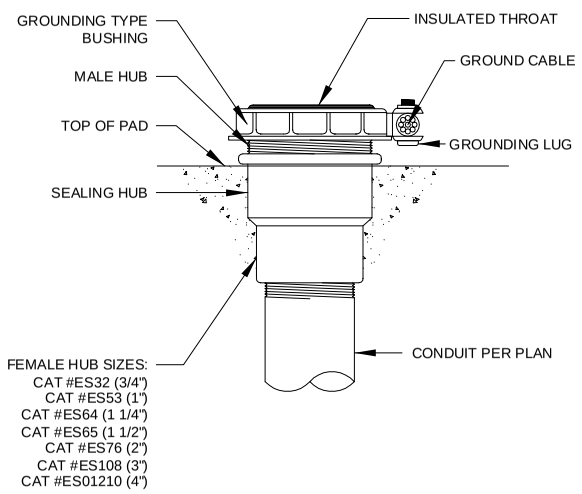
FENCE POST GROUND DETAIL 5/20

NTS



EYS CONDUIT SEAL DETAIL 6/20

NTS

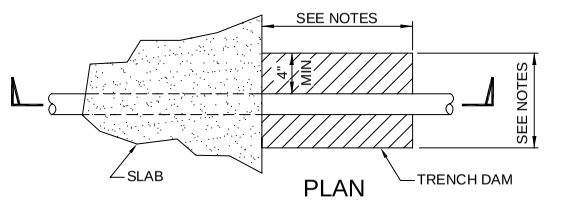


ES CONDUIT SEAL DETAIL 7/20

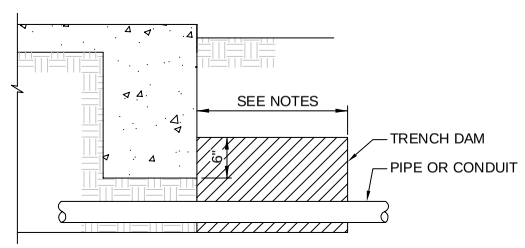
NTS

TRENCH DAM NOTES:

1. ALL TRENCH DAMS SHALL BE INSTALLED IN TRENCHES CONTAINING PIPING AND CONDUIT THAT CONNECTS DIRECTLY FROM THE UTILITY LINES TO THE FACILITY.
2. THE WIDTH OF A TRENCH DAM SHALL BE ONE HALF THE LENGTH.
3. TRENCH DAMS SHALL BE CONSTRUCTED OF ONE OF THE FOLLOWING:
   a. BENTONITE CEMENT SLURRY THREE FEET LONG: A MIXTURE OF 4% TYPE II CEMENT AND 2% POWERED BENTONITE.
   b. COMPACTED NATIVE SOILS BACKFILL FIVE FEET LONG: NATIVE SOILS SHALL BE COMPACTED AT LEAST 90% RELATIVE COMPACTION IN ACCORDANCE WITH ASTM D-1557 PROCEDURES.
   c. CONCRETE MIXES OTHER THAN BENTONITE CEMENT SLURRY MAY BE USED PROVIDED CONDUIT OR PIPING IS WRAPPED WITH HIGH DENSITY PVC FOAM TAPE, CLOSED CELLS, ADHESIVE BACKED, 1/4" THICK X 1/2" WIDE SHALL BE APPLIED TO CLEAN SURFACE WITH ENDS BUTTED TOGETHER AT MOST VISIBLE LOCATIONS IN TRENCH DAM.
4. PIPING AND CONDUIT SHALL BE PROTECTED FROM CORROSION AND STRUCTURAL SETTLEMENT AS FOLLOWS:
   a. TAPE SHALL BE APPLIED ON CONDUIT AND PIPING ENCASED IN CEMENT SLURRY OR CONCRETE.
   b. TAPE SHALL BE PS-37-90, BLACK PLASTIC PVC OR PE PRESSURE-SENSITIVE CORROSION PREVENTITIVE TAPE.



PLAN



SECTION

TRENCH DAM DETAIL 8/20

NTS

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

811 Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

CITY OF BOZEMAN 1883 GALLATIN CO. MONTANA

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

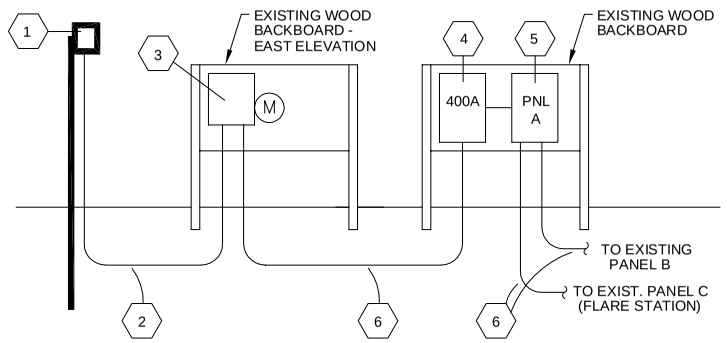
BOZEMAN LANDFILL

LFG/SVE/AI AND TREATMENT SYSTEM

TREATMENT FACILITY DETAILS

DESIGNED BY : K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 20-80-0039MECH	
CHECKED BY : M. PEARSON	DATE : 6-2015		
APPROVED BY : L. CAWLFIELD	DATE : 6-2015	SHEET 20 OF 23	

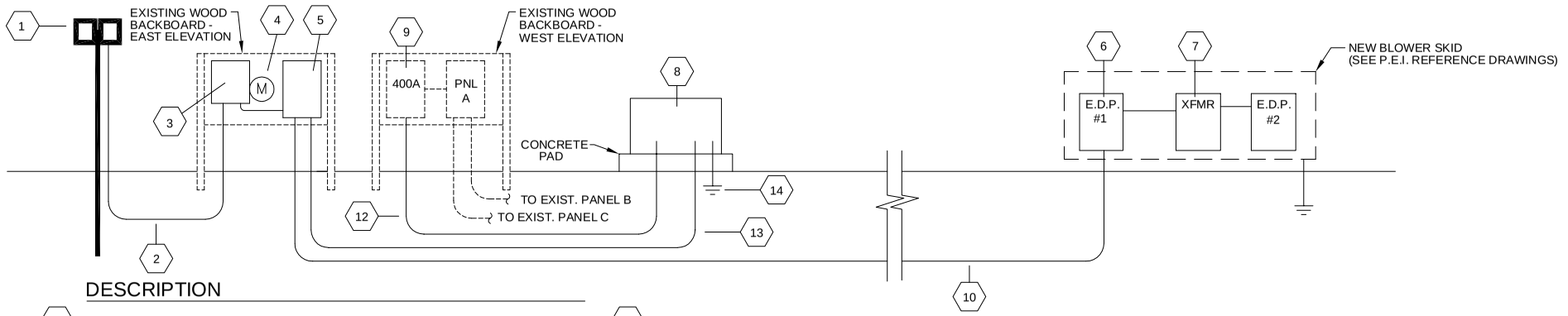
I:\dwg\Bozeman\Construction Drawings\20-80-0039MECH.dwg 5/27/15 15:32:11 scott.angus



DESCRIPTION

1. EXISTING POWERPOLE AND TRANSFORMER.
2. EXISTING UNDERGROUND FEED FROM UTILITY COMPANY TRANSFORMER.
3. EXISTING 400A, 240 VOLTS, 1Ø, C.T. CAN
4. EXISTING 400 AMP MAIN DISCONNECT PANEL
5. EXISTING 240V DISTRUBUTION PANEL
6. EXISTING CONDUIT AND WIRES

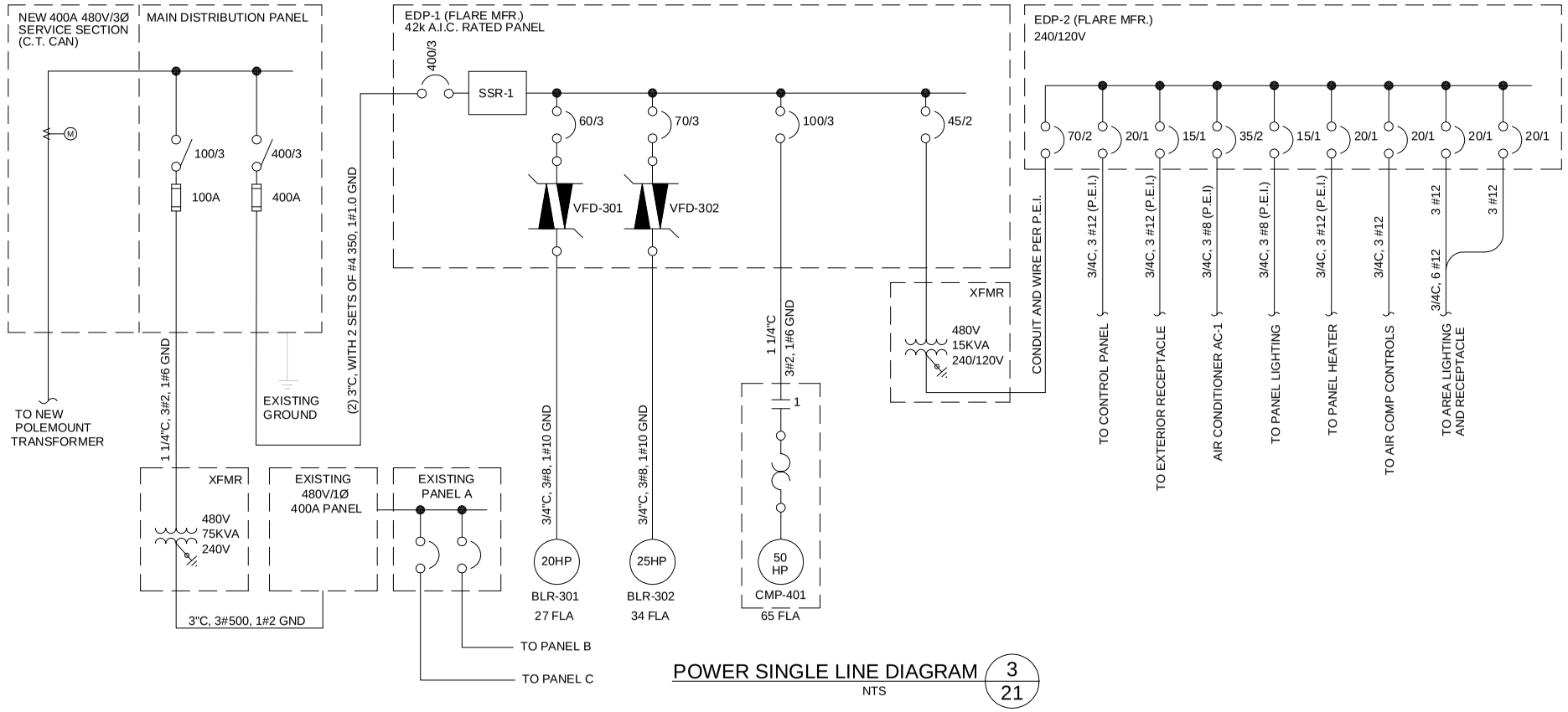
EXISTING ELECTRICAL SERVICE - 240V/1Ø — 1/21
NTS



DESCRIPTION

1. NEW POWERPOLE AND TRANSFORMER. UTILITY COMPANY WILL INSTALL POLE AND TRANSFORMER TO FEED POWER FOR THIS PROJECT.
2. NEW UNDERGROUND FEED FROM UTILITY COMPANY TRANSFORMER. THIS FEED WILL BE COMING FROM A POLE MOUNTED BANK OF TRANSFORMERS. COORDINATE DETAILS WITH THE UTILITY REPRESENTATIVE. FOLLOW THE UTILITY COMPANY SPECIFICATIONS AND DETAILS FOR THE TRENCH, CONDUIT, FEEDERS AND BACKFILL FOR THE PROJECT.
3. NEW 400A, 480 VOLTS, 3 PHASE, C.T. SECTION PER UTILITY SPECIFICATIONS.
4. NEW 400 AMPS, 480 VOLTS, 3 PHASE METER PER UTILITY SPECIFICATIONS.
5. NEW 400 AMPS, 480 VOLTS, 3 Ø MAIN DISTRIBUTION PANEL WITH NEW 400 AMP 3 POLE CIRCUIT BREAKER AND 100A 3 POLE CIRCUIT BREAKER.
6. NEW 480 VOLTS, 3 Ø ELECTRICAL DISTRUBITION PANEL (E.D.P. #1) BY FLARE MANUFACTURER.
7. NEW 15KVA 480V/240/120V/1 Ø TRANSFORMER BY FLARE MANUFACTURER.
8. NEW 75KVA 480V/240V/1 Ø TRANSFORMER BY CONTRACTOR.
9. EXISTING 240V 400A DISCONNECT PANEL
10. FEEDER TO THE E.D.P. #1 TO BE TWO PARALLEL RUNS OF 3" CONDUITS WITH 2 SETS OF 4-#350 AND 1-#1/0 GND
11. 480V POWER CENTER ENCLOSURE (E.D.P. #1) DESIGNED BY THE EQUIPMENT SUPPLIER. VERIFY EXACT DETAILS WITH THE SUPPLIER OF THE EQUIPMENT.
12. 1 1/4"C, 3#2, 1#6 GROUND
13. 3"C, 3#500, 1#2 GROUND
14. GROUND PER NEC.

NEW ELECTRICAL SERVICE - 480V/3Ø — 2/21
NTS



POWER SINGLE LINE DIAGRAM — 3/21
NTS

PANEL EDP-1 LOAD SCHEDULE

BLOWER 301 (20 HP)	27.0 AMPS
BLOWER 302 (20 HP)	34.0 AMPS
CMP 401 (50 HP)	65.0 AMPS
15kVA XFMR	31.0 AMPS
75kVA XFMR	80.0 AMPS
TOTAL CONNECTED	237.0 AMPS
25% LARGEST LOAD	20.0 AMPS
TOTAL CONNECTED	257.0 AMPS
TOTAL CONNECTED LOAD	257.0 AMPS
25% LARGEST LOAD	20.0 AMPS
TOTAL FEEDER LOAD	277.0 AMPS

480 VOLT LOAD SCHEDULE — 4/21
NTS

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

AMES ENGINEERING, LLC
Electrical Design & Consulting
406.458.0494

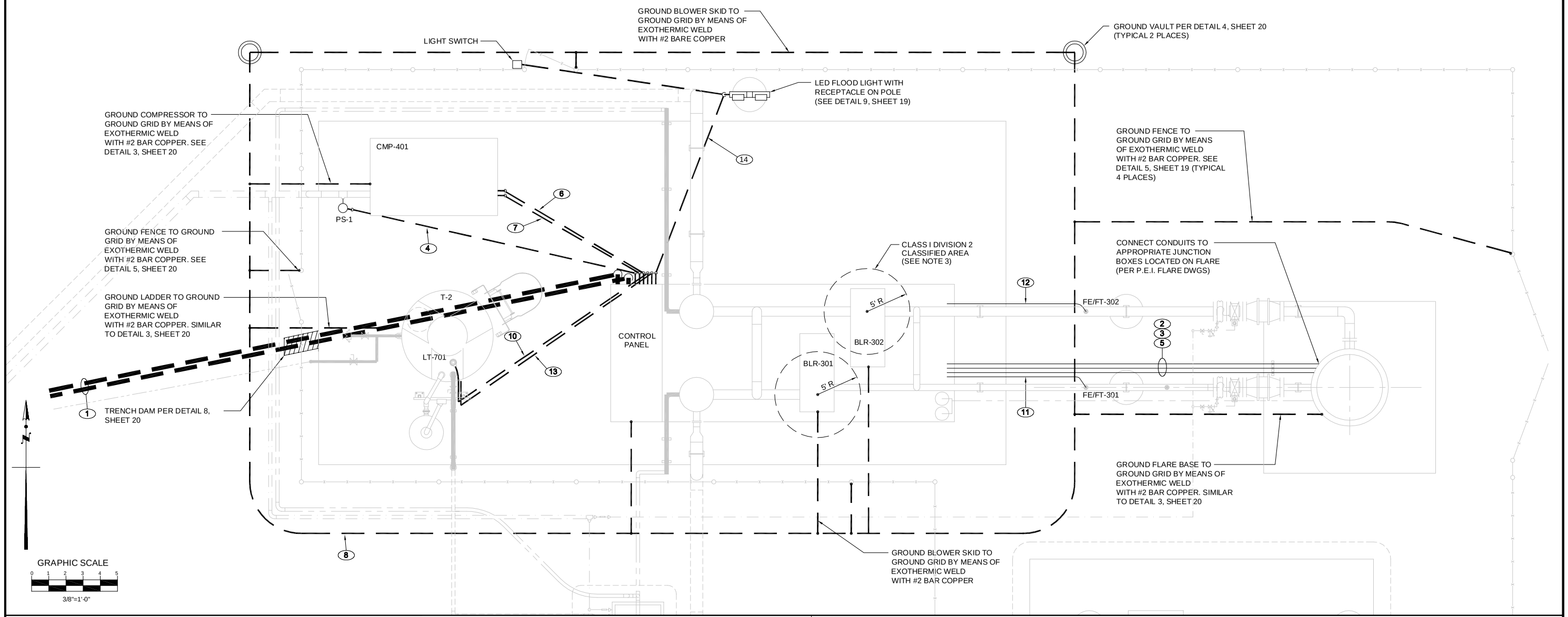
Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL
LFG/SVE/AI AND TREATMENT SYSTEM
POWER SINGLE LINE DIAGRAM AND LOAD SCHEDULES

DESIGNED BY : S. AMES	SCALE: AS SHOWN		
DRAWN BY : S. AMES/S. ANGUS	DATE : 6-2015	FILE NO.: 21-68-0006SLD	
CHECKED BY : M. PEARSON	DATE : 6-2015		
APPROVED BY : L. CAWLFIELD	DATE : 6-2015	SHEET 21 OF 23	

I:\dwg\Bozeman\Construction Drawings\21-68-0006SLD.dwg 6/30/15 16:15:30 scott.angus



CONDUIT SCHEDULE

NO.	SIZE	WIRE	TYPE	FROM	TO	NOTES
1	2-3"	2 SETS OF 4 #350, 1 #1/0 GND	480V	480V MDP	EDP-1 (FLARE SKID)	COMMON TRENCH WITH OTHER PIPES
2	3/4"	2 BELDEN 8760, 4 TYPE "KX" T/C 18 GAUGE WITH SHIELD, PVC JACKET, 1 #12 GND	SIGNAL	CONTROL PANEL	J-BOX (LV) @ FLARE (TE/FE/FCV)	FLARE MANUFACTURER TO PROVIDE WIRING
3	3/4"	7 #16, 2 #12	120V	CONTROL PANEL	J-BOX (HV) @ FLARE	
4	3/4"	3 #14	120V	CONTROL PANEL	PS-1	FLARE MFR SHALL PROVIDE PS-1/VERIFY CONDUIT STUB-UP
5	3/4"	UV SENSOR CABLES	SIGNAL	CONTROL PANEL	BE-501 @ FLARE	FLARE MFR SHALL PROVIDE WIRING
6	3/4"	4 #12	480V	EDP-1	CMP-401	VERIFY CONDUIT STUB-UP LOCATION
7	3/4"	3 #12	120V	EDP-2	AIR COMP DRYER/DRAINS	VERIFY CONDUIT STUB-UP LOCATION
8	N/A	#2/0 BARE COPPER	GROUND			
9	3/4"	6 PAIR PHONE LINE???	PHONE	CELLUAR?	?	
10	3/4"	1 BELDEN 8760	SIGNAL	CONTROL PANEL	LT-701	TANK T-2
11	3/4"	1 BELDEN 8760	SIGNAL	CONTROL PANEL	FE/FT-301	LFG PIPING TO FLARE
12	3/4"	1 BELDEN 8760	SIGNAL	CONTROL PANEL	FE/FT-302	SVE PIPING TO FLARE
13	3/4"	PER MANUFACTURER	HEAT TRACE	CONTROL PANEL	T-2	SEE NOTE 6. INSTALL PER MANUFACTURER
14	3/4"	6#12	120V	CONTROL PANEL	LIGHT/SWITCH AND RECEPTACLE	

CONSTRUCTION NOTES:

1. UNLESS OTHERWISE NOTED, ALL UNDERGROUND CONDUIT SHALL BE PVC COATED RIGID GALVANIZED STEEL. ALL EXPOSED CONDUIT SHALL BE RIGID GALVANIZED STEEL. FINAL CONNECTION TO FIELD DEVICES SHALL BE MADE WITH SHORT LENGTH (MAX 18") OF METALLIC SEALTITE FLEXIBLE CONDUIT AND APPROVED FITTINGS.
2. AREA BELOW GRADE IS CLASSIFIED AS CLASS 1, DIVISION 1. ALL UNDERGROUND CONDUITS SHALL BE FITTED WITH SEAL-OFF FITTINGS (BOTH ENDS) WHEN TERMINATING ABOVE GRADE. USE TYPE ES SEALING HUBS AT ALL FREE STANDING PANELS, AND TYPE EYS OR EZS WITHIN 12" OF FINISHED GRADE ON ALL OTHER CONDUITS. ALL SEALS TO BE PACKED AND POURED WITH APPROVED PRODUCTS. SEE SHEET 13 FOR DETAILS.
3. AREA WITHIN A 60" RADIUS OF LANDFILL GAS BLOWER SEAL IS CLASSIFIED AS CLASS I, DIVISION 2. ALL WIRING WITHIN THIS AREA SHALL COMPLY WITH SECTION 501 OF THE CURRENT VERSION OF THE NATIONAL ELECTRICAL CODE.
4. CONTRACTOR SHALL INSTALL 120V ELECTRIC AUTO DRAIN LINE AND DRYER, AS NEEDED.
5. OTHER THAN INSTRUMENTATION CABLES AND THERMOCOUPLES, ALL WIRES SHALL BE STRANDED COPPER, TYPE THWN.
6. 1,150 GALLON POLY TANK (64" DIAMETER) AND LIQUID PIPING SHALL BE HEAT TRACED.

NO.	REVISION DESCRIPTION	DATE	BY:
2	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

AMES ENGINEERING, LLC
Electrical Design & Consulting
406.458.0494

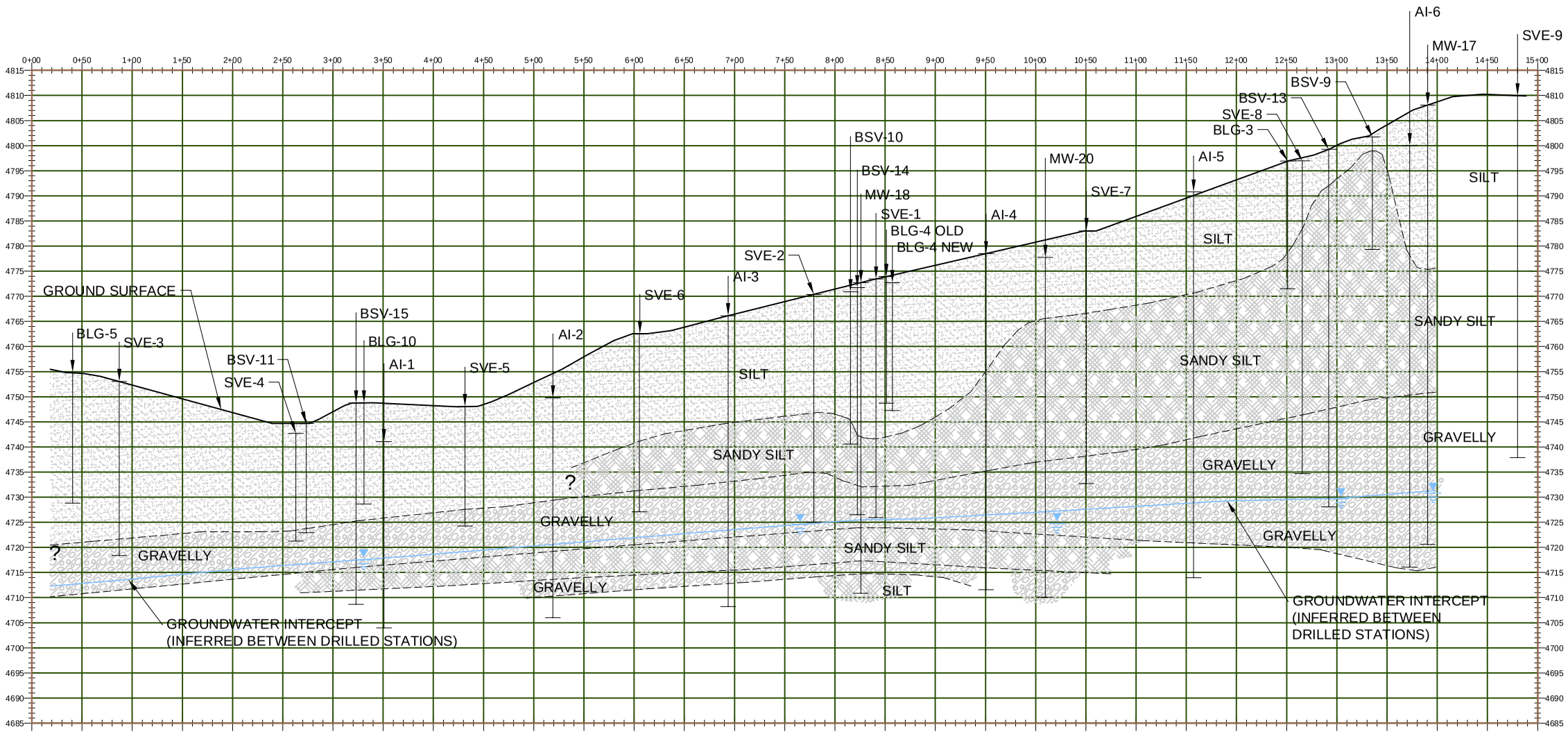
Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL
LFG/SVE/AI TREATMENT SYSTEM
ELECTRICAL PLAN AND CONDUIT SCHEDULE

DESIGNED BY : S. AMES/K. JOHNSON	SCALE: AS SHOWN		
DRAWN BY : S. ANGUS	DATE : 6-2015	FILE NO.: 22-71-0013EP	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 22 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		

I:\dwg\Bozeman\Construction Drawings\22-71-0013EP.dwg 6/26/15 16:17:20 scott.angus



12
5:1
0 60 120

NOTE:
PROVISIONAL GEOLOGIC INTERPRETATION
SILT AND/OR SANDY SILT DEPOSITS MAY CONTAIN
GRAVELLY AND/OR SANDY INTERVALS

GEOLOGIC CROSS SECTION A-A AT SOUTH BOUNDARY (A / 23)

NO.	REVISION DESCRIPTION	DATE	BY:
1	90% DESIGN SUBMITTAL	6/12/2015	SA
1	30% DESIGN SUBMITTAL	5/4/2015	SA

Utilities Underground Location Center (UULC)
Call 1-800-424-5555 (or 811)

TETRA TECH BAS
3822 E. University Drive
Phoenix, AZ 85034
TEL 602.267.0336 FAX 602.267.0446

BOZEMAN LANDFILL
LFG/SVE/AI AND TREATMENT SYSTEM
GEOLOGIC CROSS SECTION A-A ALONG SOUTH BOUNDARY

DESIGNED BY : M. BELL	SCALE: AS SHOWN		
DRAWN BY : M. BELL	DATE : 6-2015	FILE NO.: 23-33-0094XSEC	
CHECKED BY : M. PEARSON	DATE : 6-2015	SHEET 23 OF 23	
APPROVED BY : L. CAWLFIELD	DATE : 6-2015		

I:\dwg\Bozeman\Construction Drawings\23-33-0094XSEC.dwg 5/27/15 15:36:04 scott.angus