APPENDIX B
COMPRESSOR STATION, METER FACILITY, AND PIPELINE DESIGN DETAILS

Table A-1. Preliminary Compressor Station Equipment List

TAG NO	QTY	DESCRIPTION	Size	PFD DWG. NO.
	1	Pig Launcher/ Receiver	36" Barrel, 1.25" Wall, 17'-10" Long	12361-1100-010
	2	Pig Receiver	16" Barrel, 0.938" Wall, 8'-8" Long	12361-1100-010
	1	Plant Flow Meter	20" OD x 72' Long	12361-1100-010
V-100	2	Slug Catcher (2 pieces)	32'-10" x 5'-4" & 29' x 5'-4"	12361-1100-010
	2	ESD Valves	30" 600lb rating	12361-1100-010
	1	Actuated Valves	30" 600lb rating	12361-1100-010
C-300(A, B,C, D, E)	5	Compressor 9000 hp EMD/Ariel KVB Frame	Skid 75' x 14'	12361-1100-011
	5	Gas Aftercooler (2 50 hp motor drive fans)	15' x 51' - 30mm btu/hr	12361-1100-011
	5	Coalescing Filter Separator 1415 psig @ -20/150 °F	Size TBD	12361-1100-011
F-300	1	Vortex Separator 1415 psig @ -20/150 °F	Size TBD	12361-1100-011
H-100	1	Heater (TBD)	Size TBD	12361-1100-011
	4	Actuated Valve (Monitor Regulators)	Size TBD	12361-1100-011
	9	Control Valve	16" - 1500lb rating	12361-1100-011
	1	Fixed Position Back Pressure Valve	16" - 1500lb rating	12361-1100-011
F-400	11	Filter Coalescer	Size TBD	12361-1100-011
V-400 (A, B)	2	Dehydration Regen skid	13' x 40' x 12' H	12361-1100-011
	2	Overhead Cooler Skid	12' x 25' x 12' H	Vendor
	2	TEG Reboiler	72" O.D. x 24'	Vendor
	2	TEG Contactor	78" ID x 28' S/S	Vendor
	2	Stahl Column	20" O.D. x 10'	Vendor
	2	Still/Reflux condenser	30" O.D. x 20'	Vendor
	2	TEG Surge Tank	54" O.D. x 24'	Vendor
	1	Pig Launcher/Receiver	16" Barrel, 0.938" Wall, 8'-8" Long	12361-1100-012
	6	Wellhead Flow meter Single Pass 1500lb rating	Size TBD	12361-1100-012
V-600 (A,B,C,D)	3	Wellhead Separator 3540 psig @ -20/150°F	24" O.D. x 96" Long	12361-1100-012
	1	Chemical Injection skid	10' x 10'	12361-1100-012
	1	Corrosion Inhibitor/Methanol Tank	Size TBD	12361-1100-012
	3	Control Valves	6" - 1500lb rating	12361-1100-012
	6	Actuated Valve	10" - 1500lb rating	12361-1100-012
	3	ESD Valve	10" - 1500lb rating	12361-1100-012
	2	Pig Launcher/Receiver	16" Barrel, 0.938" Wall, 8'-8" Long	12361-1100-013
	6	Wellhead Flow meter Single Pass 1500lb rating	Size TBD	12361-1100-013

Table A-1. Preliminary Compressor Station Equipment List

TAG NO	QTY	DESCRIPTION	Size	PFD DWG. NO.
V-700 (A,B,C)	3	Wellhead Separator 3540 psig @ - 20/150°F	24” O.D. x 96” Long	12361-1100-013
	1	Chemical Injection skid	10' x 10'	12361-1100-013
	1	Corrosion Inhibitor/Methanol Tank	Size TBD	12361-1100-013
	3	Control Valves	6" - 1500lb rating	12361-1100-013
	6	Actuated Valve	10" - 1500lb rating	12361-1100-013
	3	ESD Valve	10" - 1500lb rating	12361-1100-013
`	2	Pig Launcher/Receiver	20" Barrel, 0.938" Wall, 9’-7” Long	12361-1100-014
	6	Wellhead Flow meter Single Pass 1500lb rating	Size TBD	12361-1100-014
V-800 (A,B,C)	3	Wellhead Separator 3540 psig @ - 20/150°F	24” O.D. x 96” Long	12361-1100-014
	1	Chemical Injection skid	10' x 10'	12361-1100-014
	1	Corrosion Inhibitor/Methanol Tank	Size TBD	12361-1100-014
	3	Control Valves	6" - 1500lb rating	12361-1100-014
	6	Actuated Valve	10" - 1500lb rating	12361-1100-014
	3	ESD Valve	10" - 1500lb rating	12361-1100-014
`	1	Pig Launcher/Receiver	20" Barrel, 0.938" Wall, 9’-7” Long	12361-1100-015
	6	Wellhead Flow meter Single Pass 1500lb rating	Size TBD	12361-1100-015
V-800 (A,B,C)	3	Wellhead Separator 3540 psig @ - 20/150°F	24” O.D. x 96” Long	12361-1100-015
	1	Chemical Injection skid	10' x 10'	12361-1100-015
	1	Corrosion Inhibitor/Methanol Tank	Size TBD	12361-1100-015
	3	Control Valves	6" - 1500lb rating	12361-1100-015
	6	Actuated Valve	10" - 1500lb rating	12361-1100-015
	3	ESD Valve	10" - 1500lb rating	12361-1100-015
T-500	3	Produced Water Storage Tank (750 Bbl API-12F)	15'-6" O.D. x 24" High	12361-1100-016
P-500	1	Produced Water Disposal Pump TBD	Size TBD	12361-1100-016
	5	VFD's (1400.13kv-6kv 380fla)	10' x 35'	Electrical Drawings
	1	Transformer 1000.115kvD-13.8kvY	12' x 20'	Electrical Drawings
	2	MCC (1010.480V 1600aH 800aV 65kaI)	10' x 40'	Electrical Drawings
	1	13kv Switch gear	TBD	Electrical Drawings
	1	Transformer 1001. 13kvD-480vY	12' x 20'	Electrical Drawings
	3	Manual 115Kv1200a No Load Switch	TBD	Electrical Drawings
	3	BusMtd 115Kv74kMCOV Arrestor	TBD	Electrical

Table A-1. Preliminary Compressor Station Equipment List

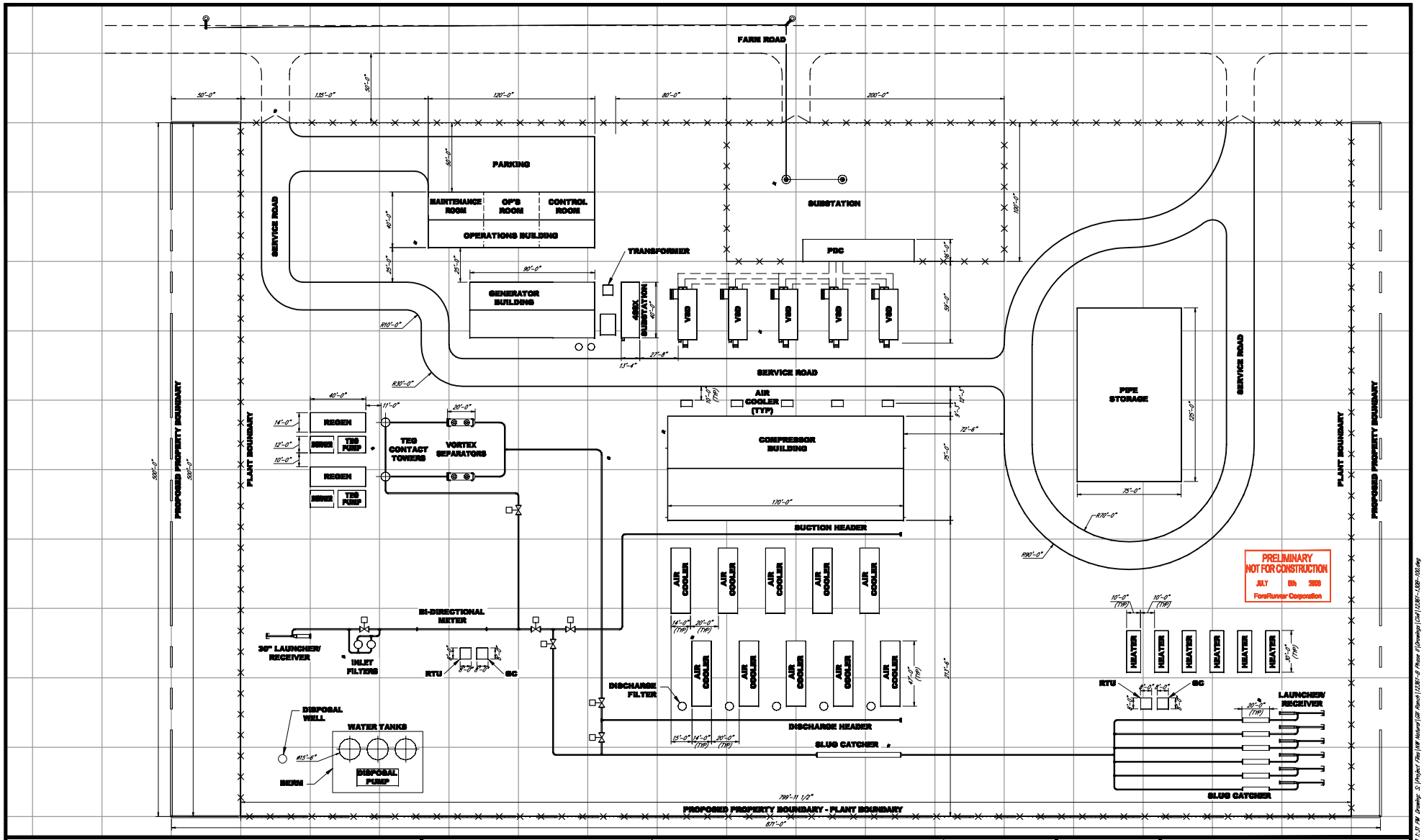
TAG NO	QTY	DESCRIPTION	Size	PFD DWG. NO.
				Drawings
	3	BusMtd Combo Current Voltage Transformer	TBD	Electrical Drawings
	1	Revenue Meter	TBD	Electrical Drawings
	1	GFC Switch 115Kv1200a	TBD	Electrical Drawings
	2	Communication Tower	Apprx 100'	Electrical Drawings

Table A-2. Compressor Station Estimated Surface Area of Impervious Surfaces

Description	Length	Width	Number	Total SA
Compressor Bldg	165	65	1	7507.5
Air Coolers	15	49	5	3675
Water Tank & Containment	65	50	1	3250
Main Transformer Pad	12	20	1	240
Protective Relay Enclosure	8	8	1	64
PDC	80	16	1	1280
Generator Bldg	75	50	1	3750
420V MCC	10	40	1	400
480V Transformer	10	10	1	100
Operations Bldg	150	50	1	7500
Dehy Regen Skids	14	40	2	1120
Dehy Towers	15	15	2	450
Compressor VFD's	10	35	5	1750
Service Road E	1131	20	1	22620
Service Road W	325	20	1	6500
Estimate surface area with 20% extra factor			**72247.8**	**sq ft**

Table A-2. Compressor Station Estimated Surface Area of Impervious Surfaces

Description	Length	Width	Number	Total SA
Compressor Bldg	165	65	1	7507.5
Air Coolers	15	49	5	3675
Water Tank & Containment	65	50	1	3250
Main Transformer Pad	12	20	1	240
Protective Relay Enclosure	8	8	1	64
PDC	80	16	1	1280
Generator Bldg	75	50	1	3750
420V MCC	10	40	1	400
480V Transformer	10	10	1	100
Operations Bldg	150	50	1	7500
Dehy Regen Skids	14	40	2	1120
Dehy Towers	15	15	2	450
Compressor VFD's	10	35	5	1750
Service Road E	1131	20	1	22620
Service Road W	325	20	1	6500
Estimate surface area with 20% extra factor			**72247.8**	**sq ft**



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REVISIONS					
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P6	ISSUED PRELIMINARY	SJB	5/29/08		
P5	RESIZED COMP BLD, ADDED COOLERS & PWR LINES	MCW	05/13/08		
P4	REVISED EQUIPMENT LAYOUT & RENAMED DWG NUM	MCW	04/02/08		
P3	REVISED SUBSTATION SIZE	NBH	03/5/08		
P2	REVISED COMPRESSOR/ELECTRICAL LAYOUT	NBH	02/20/08		
P1	PRELIMINARY FOR CLIENT REVIEW	GAN	10/18/07		

ENGINEERING RECORD		
DRAWN	G.NELSON	10/16/07
CHECKED		
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH SITE PLAN

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
1"=30'	12361-B		12361-1308-100	P7

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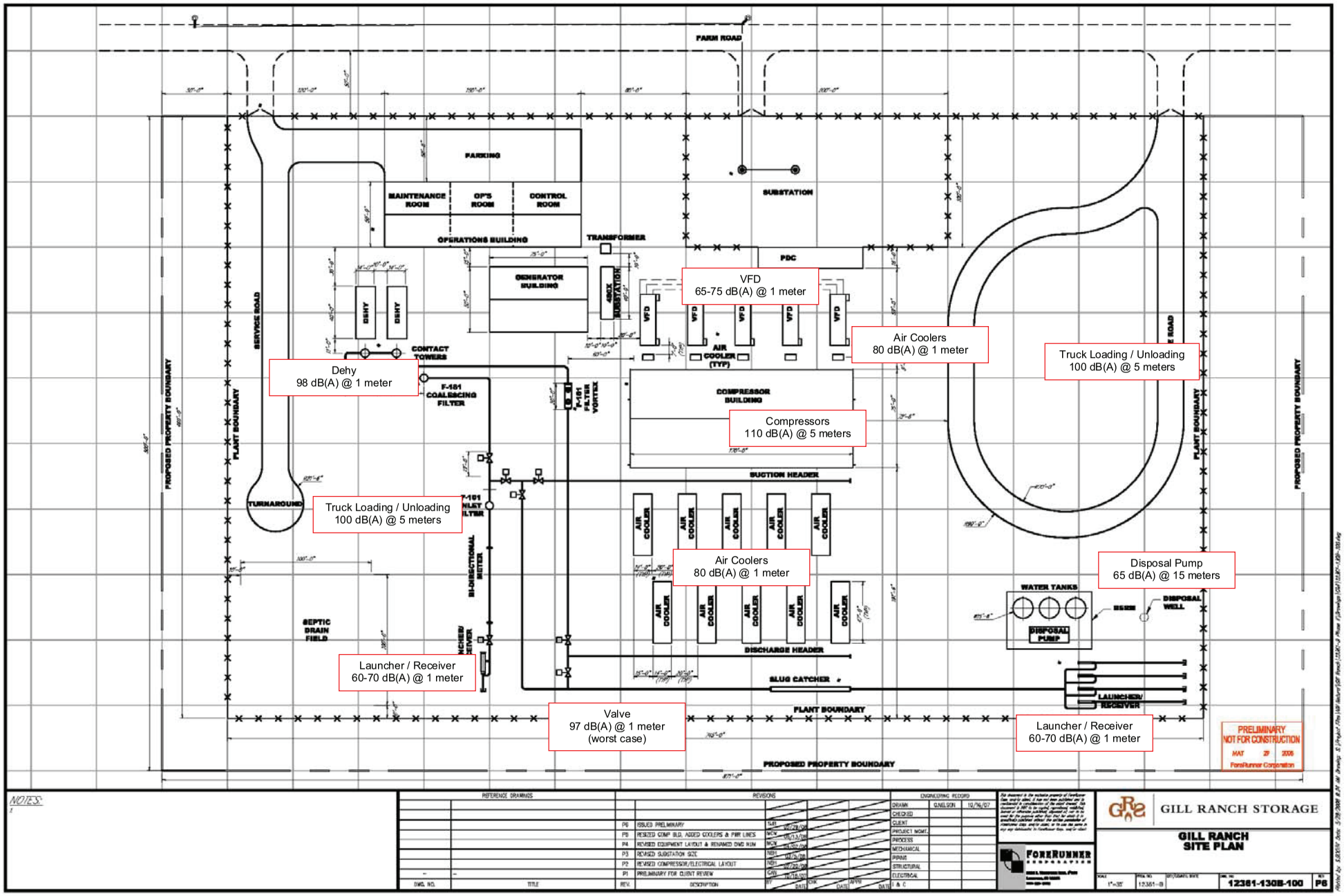

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								CHECKED		
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			P5	RESIZED COMP BLD, ADDED COOLERS & PIPE LINES	WCW	05/13/08		PROJECT MGMT.		
			P4	REVISED EQUIPMENT LAYOUT & RENAMED DWG RUN	WCW	04/30/08		PROCESS		
			P3	REVISED SUBSTATION SIZE	NSH	04/29/08		MECHANICAL		
			P2	REVISED COMPRESSOR/ELECTRICAL LAYOUT	NSH	04/29/08		PIPING		
			P1	PRELIMINARY FOR CLIENT REVIEW	CAN	04/18/07		STRUCTURAL		
DWG. NO.	TITLE		REV.	DESCRIPTION	BY	DATE	CHK. APPR. DATE	ELECTRICAL		
								I & C		

GILL RANCH STORAGE

GILL RANCH SITE PLAN

SCALE	PROJ. NO.	DOCUMENT NO./TYPE	DWG. NO.	REV.
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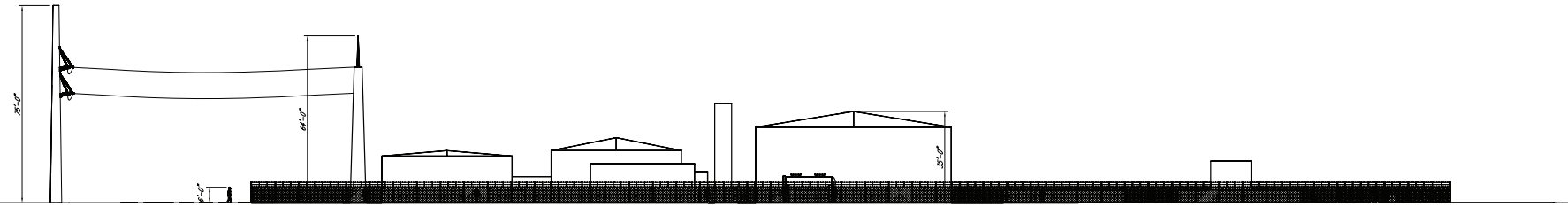

ELEVATION LOOKING EAST

SCALE: NONE
APROX. VIEWING DISTANCE 500ft

PRELIMINARY
NOT FOR CONSTRUCTION
MAY 29 2008
ForeRunner Corporation

NOTES:
1.

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		P2	RESIZED COMP BLD, ADDED COOLERS & PWR LINES	MCW	05/13/08			PIPING		
		P1	PRELIMINARY FOR CLIENT REVIEW	MCW	04/11/08			STRUCTURAL		
DWG. NO.	TITLE	REV.	DESCRIPTION	BY	DATE	CHK	APPR	ELECTRICAL		
						DATE	DATE	I & C		

FORERUNNER CORPORATION
[illegible]

GILL RANCH STORAGE

GILL RANCH
ELEVATION LOOKING EAST

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
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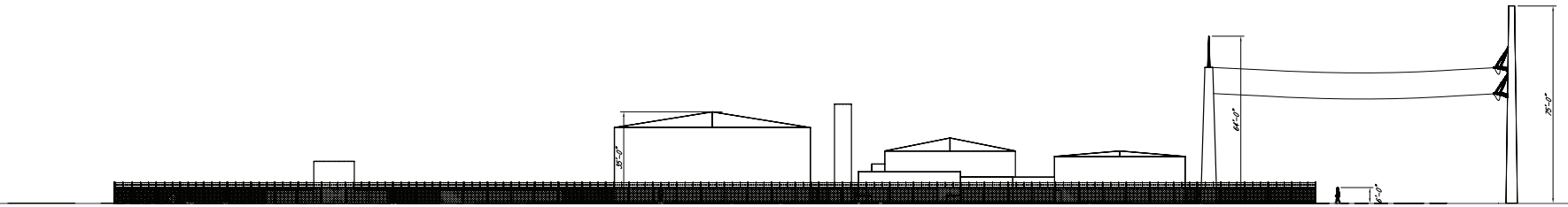

ELEVATION LOOKING WEST

SCALE: NONE
APROX. VIEWING DISTANCE 500ft

PRELIMINARY
NOT FOR CONSTRUCTION
MAY 29 2008
ForeRunner Corporation

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		P1	PRELIMINARY FOR CLIENT REVIEW	MCW	04/10/08			STRUCTURAL		
DWG. NO.	TITLE	REV.	DESCRIPTION	BY	DATE	CHK	APPR	ELECTRICAL		
						DATE	DATE	I & C		

FORERUNNER CORPORATION
[redacted]

GILL RANCH STORAGE

GILL RANCH
ELEVATION LOOKING WEST

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
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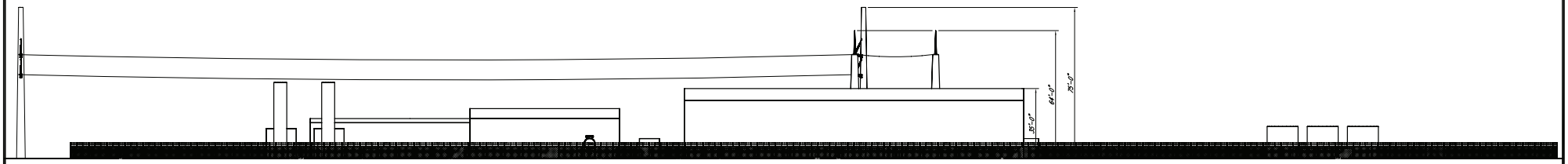

ELEVATION LOOKING NORTH

SCALE: NONE
APROX. VIEWING DISTANCE 500ft

PRELIMINARY
NOT FOR CONSTRUCTION
MAY 29 2008
ForeRunner Corporation

NOTES:
1.

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								I & C		

FORERUNNER CORPORATION
2000 S. TELEGRAPH RDS. #100
LAGUNA, CA 94000
000-000-0000

GILL RANCH STORAGE

GILL RANCH
ELEVATION LOOKING NORTH

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
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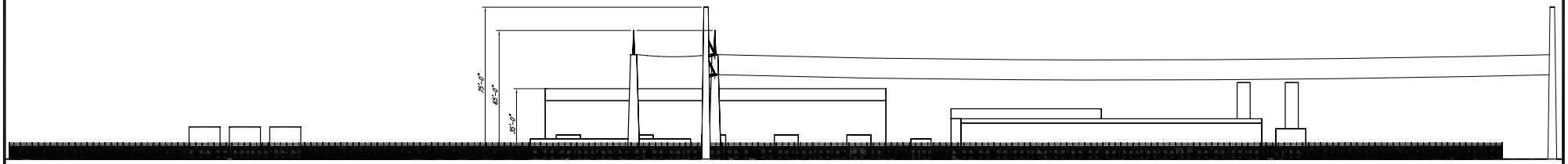

ELEVATION LOOKING SOUTH

SCALE: NONE
APROX. VIEWING DISTANCE 500ft

PRELIMINARY
NOT FOR CONSTRUCTION
MAY 29 2008
ForeRunner Corporation

NOTES:
1.

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								I & C		

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GILL RANCH STORAGE

GILL RANCH
ELEVATION LOOKING SOUTH

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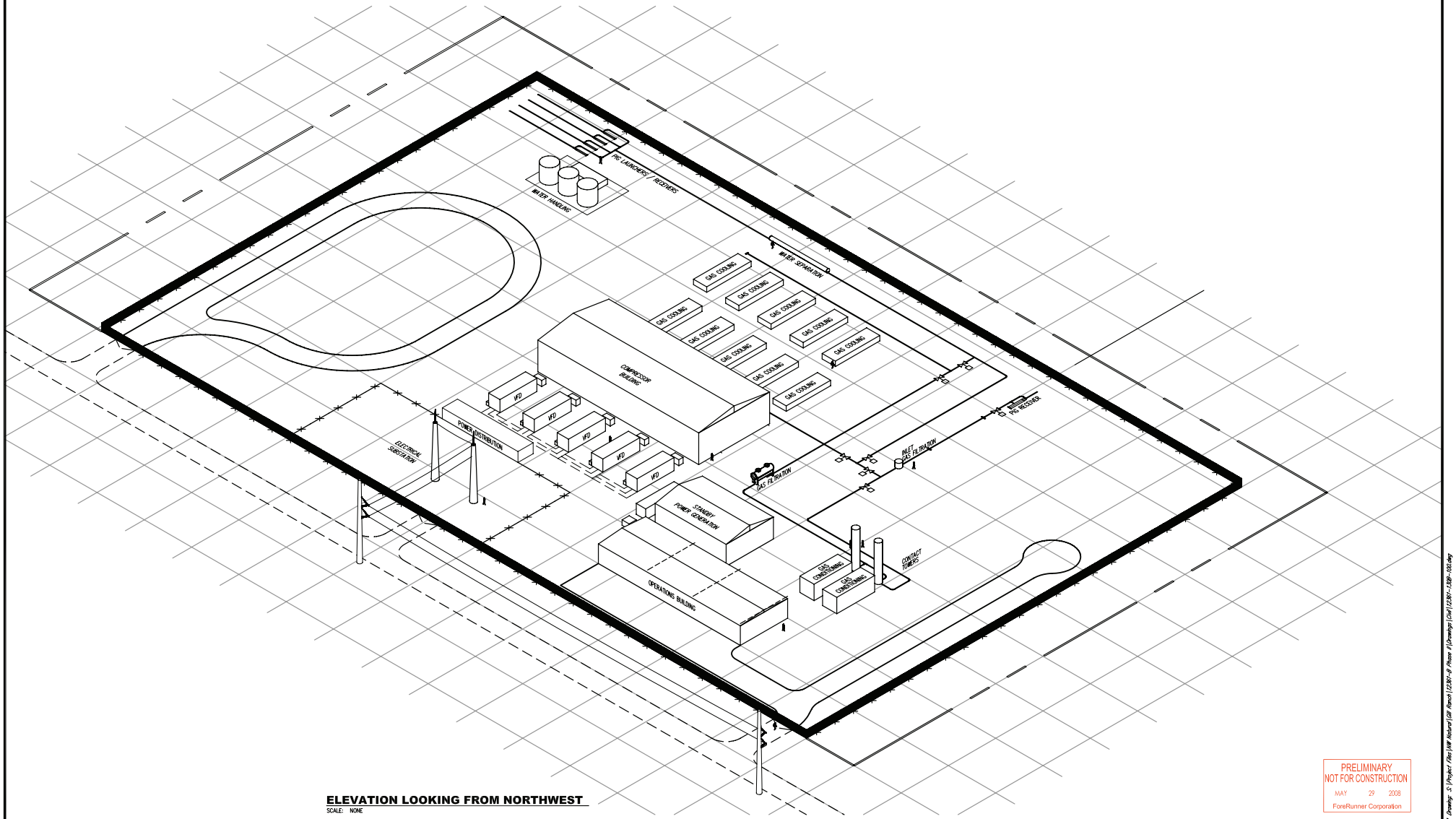

ELEVATION LOOKING FROM NORTHWEST
SCALE: NONE

PRELIMINARY
NOT FOR CONSTRUCTION
MAY 29 2008
ForeRunner Corporation

NOTES:
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								I & C		

FORERUNNER CORPORATION
2000 S. TELEGRAPH RDS. #100
LAGRANGE, CO 80222
303-999-9999

GILL RANCH STORAGE

GILL RANCH
ELEVATION LOOKING FROM NORTHWEST

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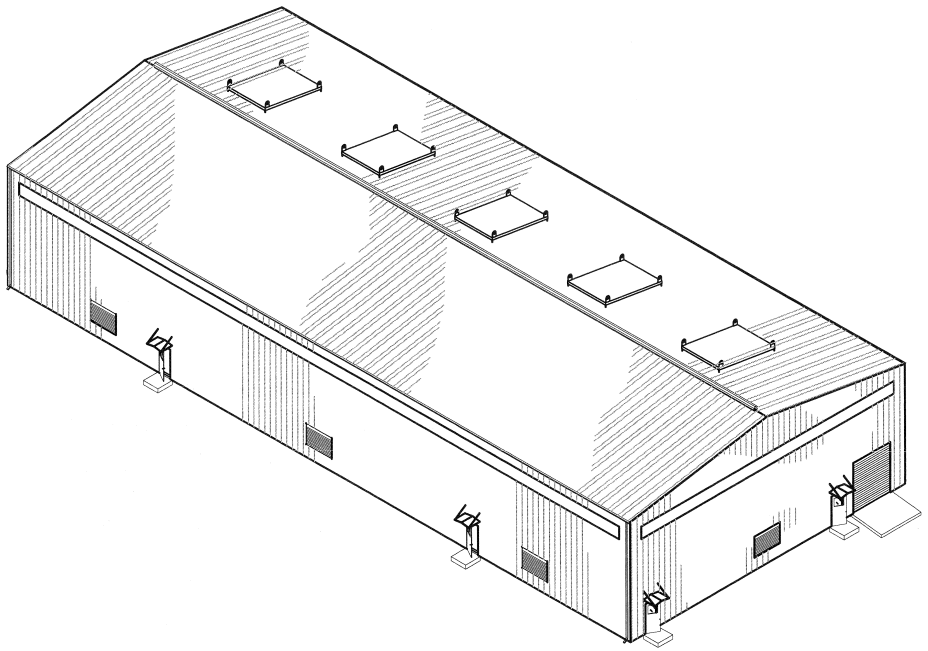


DESIGN CRITERIA & LOADS

DESIGN CODE LOCAL ORDINANCES	CBC-2007 (ADAPTATION OF IBC-2006/ASCE 7-05) MADEIRA COUNTY, CA
DEAD LOAD SNOW WIND SEISMIC	WEIGHT OF ALL STRUCTURAL MATERIALS N/A, ROOF LL = 20 PSF 90 MPH, EXPOSURE "C" Iw = 1.0 SDC = D, OCCUPANCY CATEGORY II, I_E = 1.0 S_S = 0.48, S_1 = 0.27
BRIDGE CRANE	7.5 T ELECTRIC-DRIVEN (ALL MOVEMENTS) REMOTE-CONTROLLED W/ACCESS LADDER AT THE END OF THE BUILDING, WITH PLATFORM AND HANDRAILS OVER THE GIRDER (S); W/SPARK-FREE FEATURES
COLLATERAL LOADS	10 PSF ROOF LOAD (MECHANICAL + ELECTRICAL) ROOF CONSTRUCTION LOAD POINT LOAD 250 lb.
CONTINGENCY LOADS AT FRAMES /RAFTERS	2 KIPS VERTICAL LOAD APPLIED AT ANY LOCATION 2 KIPS AT ANY POINT 2 FEET FROM THE COLUMN
SPECIAL LOADS	CABLE TRAYS & OTHER LOADS AS SHOWN & SPECIFIED
LATERAL DEFLECTION	AS PER TABLE 1604.3 IBC-2006
LOAD COMBINATIONS	AS RECOMMENDED BY ASCE 7-05
STRUCTURAL CONNECTIONS	ASTM A325 BOLTS

BUILDING SHOP DRAWINGS SHALL BE PE-STAMPED AND SUBMITTED FOR APPROVAL PRIOR TO FABRICATION.

ROOF, WALL PANELS & TRIM

BUILDING SHALL BE WEATHER TIGHT (NOT PRESSURIZED.)
ROOF SHALL BE WATERTIGHT

EXTERIOR ROOF PANELS	24 GAUGE MINIMUM/15 YEARS PAINT WARRANTY
EXTERIOR WALL PANELS	24 GAUGE MINIMUM
INTERIOR ROOF LINER PANELS	26 GA PERFORATED LINER FOR SOUND CONTROL
INTERIOR WALL LINER PANELS	26 GA FULL HEIGHT PERFORATED FOR SOUND CONTROL

EXTERIOR TRIM, FLASHING, GUTTERS AND DOWN SPOUTS 26 GAUGE MINIMUM

CADMIUM-PLATED CARBON STEEL SELF-DRILLING FASTENERS WITH LOOSE STEEL AND NEOPRENE WASHER, PAINTED TO COMPLIMENT ADJACENT PANELS, SHALL BE USED TO ATTACH THE PANELS TO THE SECONDARY MEMBERS.

CLOSED CELL, PRE-FORMED CLOSURE STRIPS HAVING A PROFILE MATCHING THE PANEL CONFIGURATION SHALL BE PROVIDED AT THE EAVE, RAKE AND RIDGE

ALL EXTERIOR, INTERIOR PANELS AND TRIM SHALL BE PAINTED PER SCHEDULE (SEE BELOW)

INSULATION

THERMAL INSULATION SHALL HAVE MINIMUM R-VALUES AS FOLLOWS:
R-13 FOR ROOF
R-11 FOR WALLS
R-11 FOR DOORS

ACOUSTIC INSULATION N/A

DOORS

PERSONNEL DOORS

ALL PERSONNEL DOORS SHALL BE EQUIPPED WITH THE FOLLOWING:
- RAIN CANOPIES W/BRACING
- INSULATED STEEL (16ga MIN.), (3) STEEL TEMPLATE HINGES
- DOOR CYLINDER, LOCK, LATCH, CLOSURE & BRACKET
- THRESHOLD, WEATHER-STRIPPING
- TEMPERED INSULATED SAFETY GLASS
- KEYED ALIKE
- PANIC HARDWARE
- PAINTED PER SCHEDULE (SEE BELOW)

(A)	SINGLE PERSONNEL DOORS DOUBLE PERSONNEL DOORS	3070 NOMINAL SIZE 6070 NOMINAL SIZE	N/A

OVERHEAD DOORS

ALL ROLL-UP OVERHEAD DOORS SHALL BE:
- EQUIPPED WITH DRUM
- MANUAL CHAIN OPERATED
- INSULATED

(B) (2) 10' W X 12'H NOMINAL SIZE

WINDOWS & TRANSLUCENT PANELS

STANDARD BUILDING VENDOR ITEMS:

(C)	5'-HIGH TRANSLUCENT PANELS 4'X 4' DOUBLE – GLAZED WINDOWS	AS SHOWN, INTERIOR & EXTERIOR FOR SOUND CONTROL N/A

HEATING, VENTILATION & A/C

HEATING
SPACE HEATERS TBD
DESIGN TEMPERATURE RANGES 60F MIN DURING THE CLODEST AMBIENT

VENTILATION
NATURAL DRAFT VENTILATION SYSTEM WITH FORCED PURGE/EXCHAUST
PROVIDE MINIMUM OF (6) ACPH [AIR CHANGES PER HOUR] NORMALLY, 12 ACPH FOR EMERGENCY PURGE
SYSTEM COMPONENTS:
(D)
- RIDGE VENT OR ROOFTOP VENTILATION UNITS FOR EXAHUST
- EXHAUST FANS
(E)
- INTAKE LOUVERS

DESIGN TEMPERATURE RANGES 85F MAX DURING THE HOTTEST AMBIENT

A/C N/A

FRAMED OPENINGS

ROOF FRAMED OPENINGS (CURB CONSTRUCTION W/REMOVABLE COVER) FOR MOTOR REMOVAL – 10'X15'
WALL FRAMED OPENINGS FOR PIPE PENETRATIONS AS SHOWN
WALL FRAMED OPENINGS FOR CABLE TRAYS ENTRY

VENDOR SHALL SUPPLAY EXTRA SIDING, INSUDATION, FLASHING, CAULCKING MATERIALS TO CLOSE THE GAPS AROUND THE WALL/ROOF PENETRATIONS & FRAMED OPENINGS

MISCELLANEOUS ACCESSORIES

(LATER)

ELECTRICAL

SEE ELECTRICAL DRAWINGS FOR WIRING, LIGHTING, LIGHTNING PROTECTION, GROUNDING, ETC.
ELECTRIC AREA CLASSIFICATION INSIDE THE BUILDING SHALL BE **CLASS 1, DIV. 2**

COLOR / FINISH SCHEDULE:

PRIMARY STRUCTURAL MEMBERS:	RED OXIDE PRIMED
SECONDARY STRUCTURAL MEMBERS:	PRE-PRIMED
ROOF PANELS:	.....
WALL PANELS:	.....
RAKE TRIM:	.....
DOWNSPOUTS:	.....
EXTERIOR WALL TRIM:	.....
PERSONNEL DOORS:	MANUFACTURER'S STANDARD PRIMER. FINISH PAINTED TO MATCH WALL COLOR
ROLL-UP DOOR:	MANUFACTURER'S STANDARD PRIMER. FINISH PAINTED TO MATCH WALL COLOR
ROOF HOODS: (EXTERIOR ONLY)	.....
WALL FANS: (EXTERIOR ONLY)	.....
ICE / SNOW CANOPY	.....

NOTES:
1.

REFERENCE DRAWINGS		REVISIONS						ENGINEERING RECORD		
								DRAWN	KLH	6/13/08
								CHECKED		
								CLIENT		
								PROJECT MGMT.		
								PROCESS		
								MECHANICAL		
		B	ISSUED FOR CLIENT'S REVIEW	SJB 7/09/08				PIPING		
		A	ISSUED FOR REVIEW	KLH 6/13/08				STRUCTURAL		
DWG. NO.	TITLE	REV.	DESCRIPTION	BY DATE	CHK DATE	APPR DATE		ELECTRICAL		
								I & C		

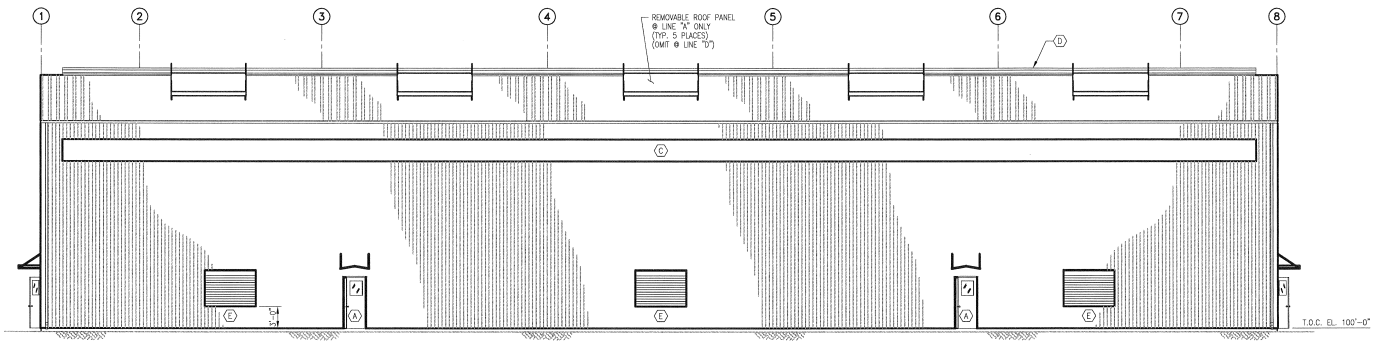
FORERUNNER CORPORATION
3900 S. Wadsworth Blvd. #800
Lakewood, CO 80235
303-985-6855

GILL RANCH STORAGE

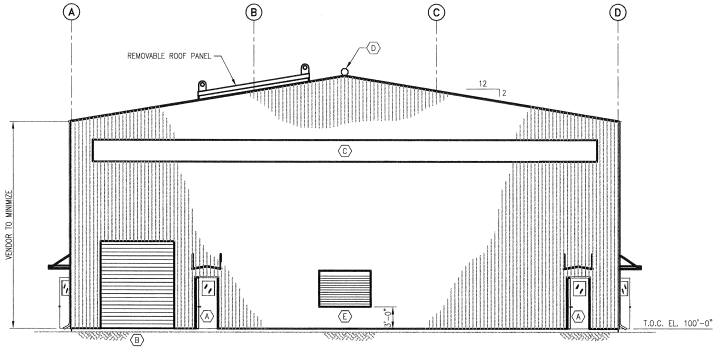
GILL RANCH STORAGE
ARCHITECTURAL
COMPRESSOR BUILDING

SCALE	PROJ. NO.	QTY./COUNTY, STATE	DWG. NO.	REV.
AS NOTED	12361-B		12361-160B-100	B

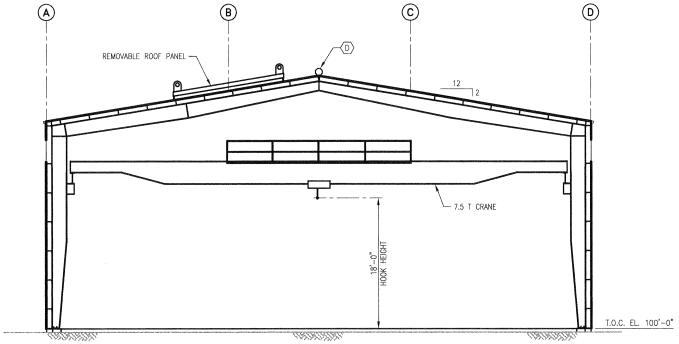
Plotted by: STEVEB Date: 7/9/2008 9:42 AM Drawing: S:\Project Files\WW Natural\Gill Ranch\12361-B Phase II\Drawings\Structural\12361-160B-100.dwg



ELEVATION @ LINES D & A (O.H.)
SCALE: 1/8"=1'-0"



ELEVATION @ LINES 1 & 8 (O.H.)
SCALE: 1/8"=1'-0"



TYPICAL BUILDING SECTION
SCALE: 1/8"=1'-0"

NOTES:
1.

REFERENCE DRAWINGS			REVISIONS					
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–	–	A	ISSUED FOR REVIEW	KLH	6/13/08			
DWG. NO.	TITLE	REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR DATE

ENGINEERING RECORD		
DRAWN	KLH	6/13/08
CHECKED		
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

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GILL RANCH STORAGE

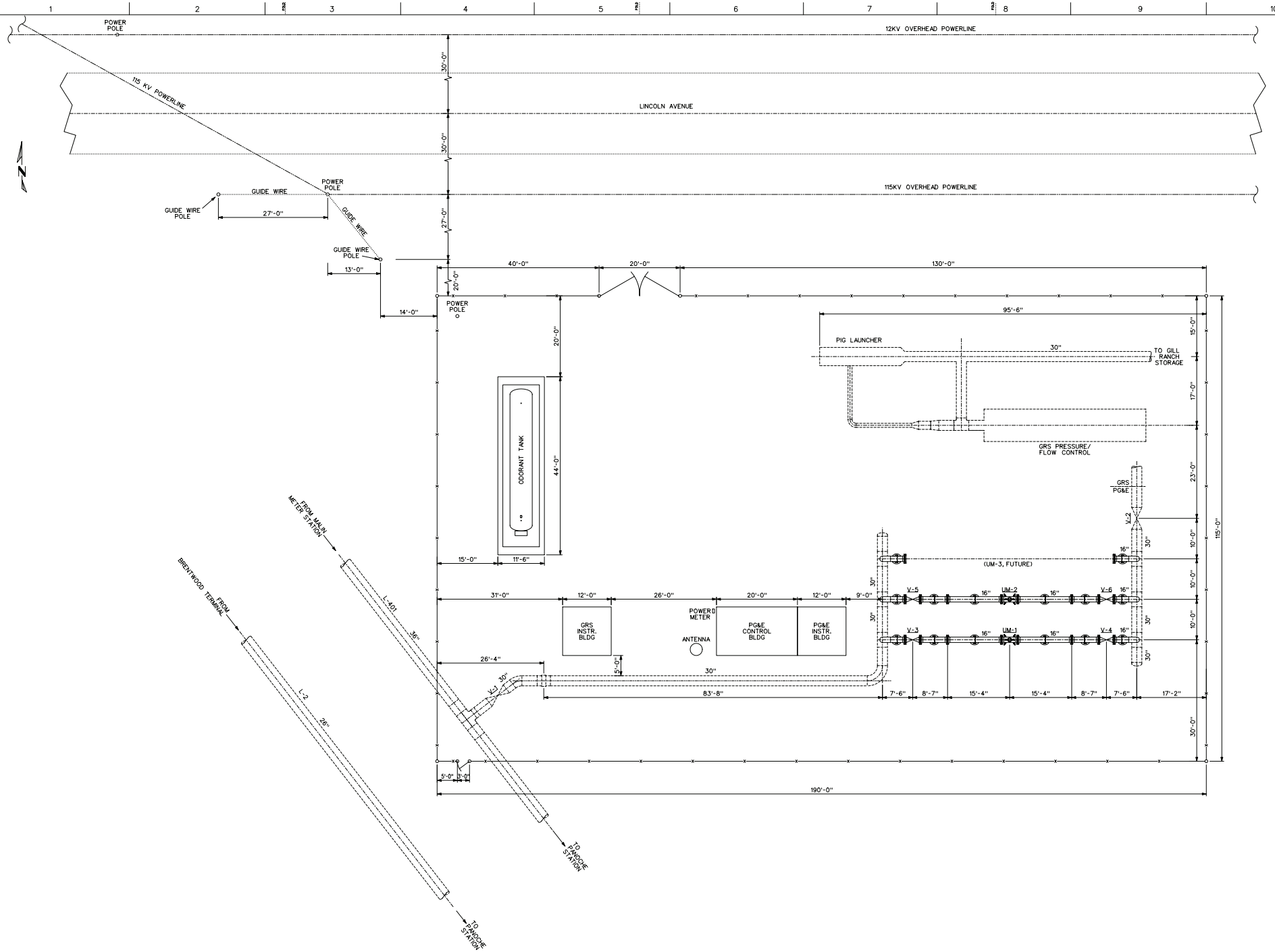
GILL RANCH STORAGE
ARCHITECTURAL
COMPRESSOR BUILDING
ELEVATIONS & SECTION

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV.
AS NOTED	12361-B		12361-160B-102	B

Table A-3. Storage Tap Facility Equipment List

TAG NO	QTY	ForeRunner Equipment	Size	PFD DWG. NO.
	1	Pig Launcher	36” Barrel 1.25” Wall 17’ -10” Long	TBD
	1	Block Valve	30” –600lb rating	TBD
	2	Blow Down Valve	4” – 600lb rating	TBD
		PLC	TBD	TBD
		Radio Tower	Apprx. 40'-100’	TBD

TAG NO	QTY	PG&E Equipment	Size	PFD DWG. NO.
TBD	TBD	Pressure Relief	Size TBD	TBD
TBD	TBD	ESD Valve	Size TBD	TBD
TBD	TBD	All other Equip TBD	Size TBD	TBD



NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
1	- - -	ISSUED FOR CONSTRUCTION	30604380	RC			

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY

REVISIONS

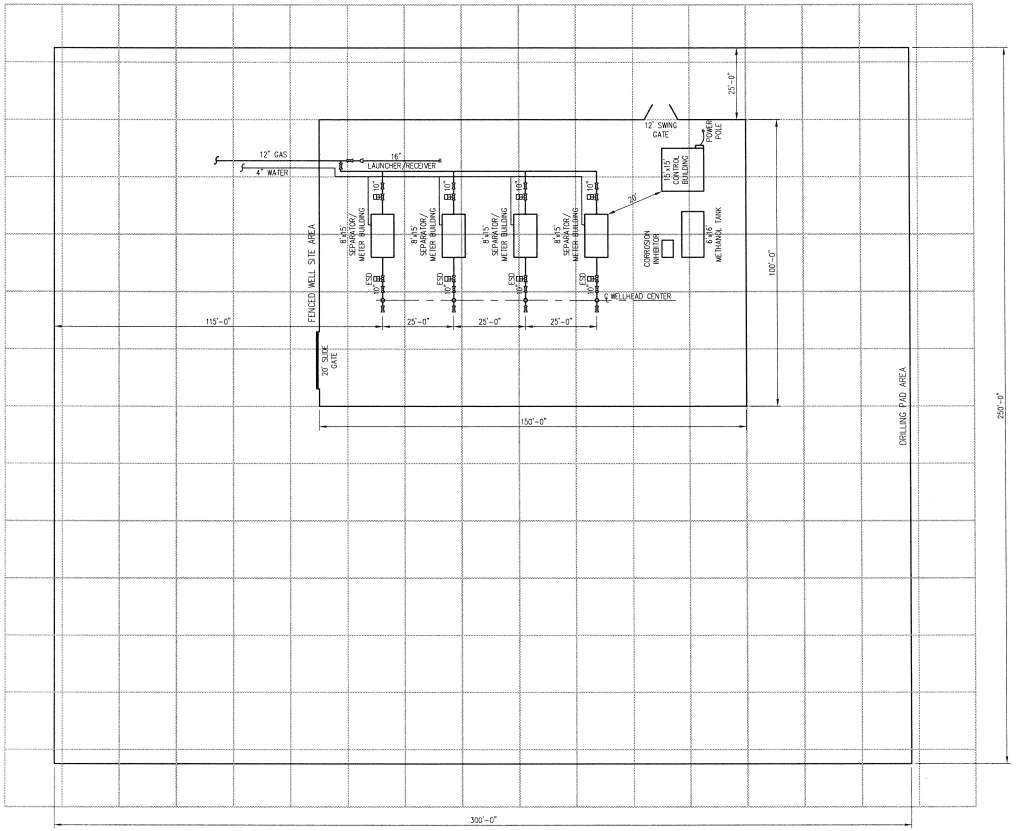
APPROVED BY	SO 30604380
	SUPV J.SHAH
	DSGN S.LAU
	DWN R.CHOW
	CHKD
	OK
	DATE
	SCALE 1/8"=1'-0"

PIPING - PLAN
MAIN GAS, YARD
GILL RANCH STATION

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	OF SHEETS
DRAWING NUMBER	REV
4800830	1

FILENAME: 4800830.DGN 5-26-09 RC



NOTES:
1.

REFERENCE DRAWINGS		REVISIONS							ENGINEERING RECORD		
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									CHECKED		
									CLIENT		
									PROJECT MGMT.		
		P4	REVISED PRELIMINARY	S.B	05/15/08				PROCESS		
		P3	REVISED LAYOUT	S.B	05/19/08				MECHANICAL		
		P2	REVISED DRAWING NUMBER	WCM	04/11/08				PIPING		
–	–	P1	PRELIMINARY	GAN	10/18/07				STRUCTURAL		
DWG. NO.	TITLE	REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	ELECTRICAL		
									I & C		

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GILL RANCH STORAGE

GILL RANCH STORAGE
TYPICAL WELL PAD SITE LAYOUT

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV.
1"=20'	12361-D		12361-130D-200	P4

Electric and Magnetic Fields

The California Public Utilities Commission (CPUC) and the California Department of Health Services (CDHS) have not concluded that exposure to magnetic fields from utility electric facilities is a health hazard. Many reports have concluded that the potential for health effects associated with electric and magnetic field (EMF) exposure is too speculative to allow the evaluation of impacts or the preparation of mitigation measures.

EMF is a term used to describe electric and magnetic fields that are created by electric voltage (electric field) and electric current (magnetic field). Power frequency EMF is a natural consequence of electrical circuits, and can be either directly measured using the appropriate measuring instruments or calculated using appropriate information.

Electric Fields

Electric fields are present whenever voltage exists on a wire, and are not dependent on current. The magnitude of the electric field is primarily a function of the configuration and operating voltage of the line and decreases with the distance from the source (line). The electric field can be shielded (i.e., the strength can be reduced) by any conducting surface, such as trees, fences, walls, buildings, and most types of structures. The strength of an electric field is measured in volts per meter (V/m) or kilovolts per meter (kV/m).

Magnetic Fields

Magnetic fields are present whenever current flows in a conductor, and are not dependent on the voltage present on the conductor. The strength of these fields also decreases with distance from the source. However, unlike electric fields, most common materials have little shielding effect on magnetic fields.

The magnetic field strength is a function of both the current on the conductor and the design of the system. Magnetic fields are measured in units called Gauss. However, for the low levels normally encountered near power systems, the field strength is expressed in a much smaller unit, the milligauss (mG), which is one thousandth of a Gauss.

Power frequency EMF is present where electricity is used. This includes not only utility transmission lines, distribution lines, and substations, but also the building wiring in homes, offices, and schools, and in the appliances and machinery used in these locations. Typical magnetic fields from these sources can range from below 1 mG to above 1,000 mG (1 Gauss).

Magnetic field strengths diminish with distance. Fields from compact sources (i.e., those containing coils such as small appliances and transformers) decrease in inverse proportion to the distance from the source cubed. For three-phase power lines with balanced currents, the

magnetic field strength drops off inversely proportional to the distance from the line squared. Fields from unbalanced currents, which flow in paths such as neutral or ground conductors, fall off inversely proportional to the distance from the source. Conductor spacing and configuration also affect the rate at which the magnetic field strength decreases.

The magnetic field levels of PG&E's overhead and underground transmission lines will vary depending upon customer power usage. Magnetic field strengths for typical PG&E transmission line loadings at the edge of rights-of-way are approximately 10 to 90 mG. Under peak load conditions, the magnetic fields at the edge of the right-of-way would not likely exceed 150 mG. There are no long-term, health-based state or federal government EMF exposure standards. State regulations for magnetic fields have been developed in New York and Florida (150 mG and 200 mG at the edge of the right-of-way). However, these are based on limiting exposure from new facilities to levels no greater than existing facilities.

The strongest magnetic fields around the outside of a substation come from the power lines entering and leaving the station. The strength of the magnetic fields from transformers and other equipment decreases quickly with distance. Beyond the substation fence, the magnetic fields produced by the equipment within the station are typically indistinguishable from background levels.

Possible Health Effects

The possible effects of EMF on human health have come under scientific scrutiny. Concern about EMF originally focused on electric fields; however, much of the recent research has focused on magnetic fields. Uncertainty exists as to what characteristics of magnetic field exposure need to be considered to assess human exposure effects. Among the characteristics considered are field intensity, transients, harmonics, and changes in intensity over time. These characteristics may vary from power lines to appliances to home wiring, and this may create different types of exposures. The exposure most often considered is intensity or magnitude of the field.

There is a consensus among the medical and scientific communities that there is insufficient evidence to conclude that EMF causes adverse health effects. Neither the medical nor scientific communities have been able to provide any foundation upon which regulatory bodies could establish a standard or level of exposure that is known to be either safe or harmful. Laboratory experiments have shown that magnetic fields can cause biologic changes in living cells, but scientists are not sure whether any risk to human health can be associated with them. Some studies have suggested an association between surrogate measures of magnetic fields and certain cancers while others have not.

California Public Utilities Commission Decision Summary

Background

On January 15, 1991, the CPUC initiated an investigation to consider its role in mitigating the health effects, if any, of electric and magnetic fields from utility facilities and power lines. A working group of interested parties, called the California EMF Consensus Group, was created by the CPUC to advise it on this issue. It consisted of 17 stakeholders representing citizens groups, consumer groups, environmental groups, state agencies, unions, and utilities. The Consensus Group's fact-finding process was open to the public, and its report incorporated concerns expressed by the public. Its recommendations were filed with the Commission in March 1992.

In August 2004 the CPUC began a proceeding known as a "rulemaking" (R.04-08-020) to explore whether changes should be made to existing CPUC policies and rules concerning EMF from electric transmission lines and other utility facilities.

Through a series of hearings and conferences, the Commission evaluated the results of its existing EMF mitigation policies and addressed possible improvements in implementation of these policies. The CPUC also explored whether new policies are warranted in light of recent scientific findings on the possible health effects of EMF exposure.

The CPUC completed the EMF rulemaking in January 2006 and presented these conclusions in Decision D.06-01-042:

- The CPUC affirmed its existing policy of requiring no-cost and low-cost mitigation measures to reduce EMF levels from new utility transmission lines and substation projects.

- The CPUC adopted rules and policies to improve utility design guidelines for reducing EMF, and provides for a utility workshop to implement these policies and standardize design guidelines.

- Despite numerous studies, including one ordered by the Commission and conducted by the California Department of Health Services, the CPUC stated "we are unable to determine whether there is a significant scientifically verifiable relationship between EMF exposure and negative health consequences."

- The CPUC said it will "remain vigilant" regarding new scientific studies on EMF, and if these studies indicate negative EMF health impacts, the Commission will reconsider its EMF policies and open a new rulemaking if necessary.

In response to a situation of scientific uncertainty and public concern, the decision specifically requires PG&E to consider "no-cost" and "low-cost" measures, where feasible, to reduce exposure from new or upgraded utility facilities. It directs that no-cost mitigation measures be undertaken, and that low-cost options, when they meet certain guidelines for field reduction and cost, be adopted through the project certification process. PG&E was directed to develop, submit and follow EMF guidelines to implement the CPUC decision. Four percent of total project budgeted cost is the benchmark in implementing EMF mitigation, and mitigation measures should achieve incremental magnetic field reductions of at least 15%.

Reviews of EMF Studies

Hundreds of EMF studies have been conducted over the last 20 years in the areas of epidemiology, animal research, cellular studies, and exposure assessment. A number of nationally recognized multi-discipline panels have performed comprehensive reviews of the body of scientific knowledge on EMF. These panels' ability to bring experts from a variety of disciplines together to review the research gives their reports recognized credibility. It is standard practice in risk assessment and policymaking to rely on the findings and consensus opinions of these distinguished panels. None of these groups have concluded that EMF causes adverse health effects or that the development of standards were appropriate or would have a scientific basis.

Reports by the National Research Council/National Academy of Sciences, American Medical Association, American Cancer Society, National Institute of Environmental Health Sciences, World Health Organization, International Agency for Research on Cancer, and California Department of Health Services conclude that insufficient scientific evidence exists to warrant the adoption of specific health-based EMF mitigation measures. The potential for adverse health effects associated with EMF exposure is too speculative to allow the evaluation of impacts or the preparation of mitigation measures.

National Institute of Environmental Health Sciences

In June of 1999, the federal government completed a $60-million EMF research program managed by the National Institute of Environmental Health Sciences (NIEHS) and the Department of Energy (DOE). Known as the EMF RAPID (Research And Public Information Dissemination) Program. In their report to the U.S. Congress, the NIEHS concluded that:

> The NIEHS believes that the probability that ELF-EMF exposure is truly a health hazard is currently small. The weak epidemiological associations and lack of any laboratory support for these associations provide only marginal, scientific support that exposure to this agent is causing any degree of harm.

The NIEHS report also included the following conclusions:

> The National Toxicology Program routinely examines environmental exposures to determine the degree to which they constitute a human cancer risk and produces the 'Report on Carcinogens' listing agents that are 'known human carcinogens' or 'reasonably anticipated to be human carcinogens.' It is our opinion that based on evidence to date, ELF-EMF exposure would not be listed in the 'Report on Carcinogens' as an agent 'reasonably anticipated to be a human carcinogen.' This is based on the limited epidemiological evidence and the findings from the EMF-RAPID Program that did not indicate an effect of ELF-EMF exposure in experimental animals or a mechanistic basis for carcinogenicity.
>
> The NIEHS agrees that the associations reported for childhood leukemia and adult chronic lymphocytic leukemia cannot be dismissed easily as random or negative findings. The lack of positive findings in animals or in mechanistic studies weakens the belief that this association is actually due to ELF-EMF, but cannot completely discount the finding. The NIEHS also agrees with the conclusion that no other cancers or non-cancer health outcomes provide sufficient evidence of a risk to warrant concern.
>
> Epidemiological studies have serious limitations in their ability to demonstrate a cause and effect relationship whereas laboratory studies, by design, can clearly show that cause and effect are possible. Virtually all of the laboratory evidence in animals and humans and most of the mechanistic work done in cells fail to support a causal relationship between exposure to ELF-EMF at environmental levels and changes in biological function or disease status. The lack of consistent, positive findings in animal or mechanistic studies weakens the belief that this association is actually due to ELF-EMF, but it cannot completely discount the epidemiological findings.
>
> The NIEHS suggests that the level and strength of evidence supporting ELF-EMF exposure as a human health hazard are insufficient to warrant aggressive regulatory actions; thus, we do not recommend actions such as stringent standards on electric appliances and a national program to bury all transmission and distribution lines. Instead, the evidence suggests passive measures such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. NIEHS suggests that the power industry continue its current practice of siting power lines to reduce exposures and continue to explore ways to reduce the creation of magnetic fields around transmission and distribution lines without creating new hazards. We also encourage technologies that lower exposures from neighborhood distribution lines provided that they do not increase other risks, such as those from accidental electrocution or fire.

U.S. National Research Council/ National Academy of Sciences

In May 1999, the National Research Council/ National Academy of Sciences, an independent scientific agency responsible for advising the federal government on science, technology, and medicine, released its evaluation of the scientific and technical content of research projects conducted under the U.S. EMF RAPID Program, concluding that:

> The results of the EMF-RAPID program do not support the contention that the use of electricity poses a major unrecognized public-health danger. Basic research on the effects of power-frequency magnetic fields on cells and animals should continue, but a special research-funding effort is not required. Investigators should compete for funding through traditional research-funding mechanisms. If future research on this subject is funded through such mechanisms, it should be limited to tests of well-defined mechanistic hypotheses or replications of reported positive effects. If carefully performed, such experiments will have value even if their results are negative. Special efforts should be made to communicate the conclusions of this effort to the general public effectively.

The following specific recommendations are made by the committee:

1. The committee recommends that no further special research program focused on possible health effects of power-frequency magnetic fields be funded. Basic research on the effects of power-frequency magnetic fields on cells and animals should continue but investigators should compete for funding through traditional research funding mechanisms.
2. If, however, Congress determines that another time-limited, focused research program on the health effects of power-frequency magnetic fields is warranted, the committee recommends that emphasis be placed on replications of studies that have yielded scientifically promising claims of effects and that have been reported in peer-reviewed journals. Such a program would benefit from the use of a contract-funding mechanism with a requirement for complete reports and/or peer-reviewed publications at program's end.
3. The engineering studies were initiated without the guidance of a clearly established biologic effect. The committee recommends that no further engineering studies be funded unless a biologic effect that can be used to plan the engineering studies has been determined.
4. Much of the information from the EMF-RAPID biology program has not been published in peer-reviewed journals. NIEHS should collect all future peer-reviewed information resulting from the EMF-RAPID biology projects and publish a summary report of such information periodically on the NIEHS Web site.
5. The communication effort initiated by EMF-RAPID is reasonable. The two booklets and the telephone information line are useful, as is the EMF-RAPID Internet site. There are two limitations to the effort. First, it is largely passive, responding to inquiries and providing information, rather than being active. Second, much of the information

produced is in a scientific format not readily understandable by the public. The committee recommends that further material produced to disseminate information on power-frequency magnetic fields be written for the general public in a clear fashion. The Web site should be made more user-friendly. The booklet *Questions and Answers about EMF* should be updated periodically and made available to the public.

World Health Organization

The World Health Organization (WHO) established the International EMF Project in 1996 to investigate potential health risks associated with exposure to electric and magnetic fields (EMF). A WHO Task Group recently concluded a review of the health implications of extremely low frequency (ELF) EMF.

A Task Group of scientific experts was convened in 2005 to assess any risks to health that might exist from exposure to ELF electric and magnetic fields. Previously in 2002, the International Agency for Research on Cancer (IARC) examined the evidence regarding cancer; this Task Group reviewed evidence for a number of health effects, and updated the evidence regarding cancer. The conclusions and recommendations of the Task Group are presented in a WHO report titled: "Extremely Low Frequency Fields Environmental Health Criteria Monograph No.238" and Factsheet No 322.

> "New human, animal and in vitro studies, published since the 2002 IARC monograph, do not change the overall classification of ELF magnetic fields as a possible human carcinogen."
>
> "A number of other diseases have been investigated for possible association with ELF magnetic field exposure. These include cancers in both children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological modifications and neurological disease. The scientific evidence supporting a linkage between ELF magnetic fields and any of these diseases is much weaker than for childhood leukaemia and in some cases (for example, for cardiovascular disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease."
>
> "the epidemiological evidence is weakened by methodological problems, such as potential selection bias. In addition, there are no accepted biophysical mechanisms that would suggest that low-level exposures are involved in cancer development. Thus, if there were any effects from exposures to these low-level fields, it would have to be through a biological mechanism that is as yet unknown. Additionally, animal studies have been largely negative. Thus, on balance, the evidence related to childhood leukaemia is not strong enough to be considered causal."
>
> "Policy-makers should establish an ELF EMF protection programme that includes measurements of fields from all sources to ensure that the exposure limits are not exceeded either for the general public or workers."

> "Government and industry should monitor science and promote research programmes to further reduce the uncertainty of the scientific evidence on the health effects of ELF field exposure."
>
> "Policy-makers, community planners and manufacturers should implement very low-cost measures when constructing new facilities and designing new equipment including appliances."
>
> "Changes to engineering practice to reduce ELF exposure from equipment or devices should be considered, provided that they yield other additional benefits, such as greater safety, or little or no cost."
>
> "When changes to existing ELF sources are contemplated, ELF field reduction should be considered alongside safety, reliability and economic aspects."

International Agency for Research on Cancer

In June of 2001, the International Agency for Research on Cancer (IARC), a branch of the World Health Organization (WHO), evaluated the carcinogenic risk to humans of static and extremely low-frequency EMF. In October of 2001, the WHO published a Fact Sheet that summarized the IARC findings. Below is an excerpt from the fact sheet:

> In June 2001, an expert scientific working group of IARC reviewed studies related to the carcinogenicity of static and ELF electric and magnetic fields. Using the standard IARC classification that weighs human, animal and laboratory evidence, ELF magnetic fields were classified as possibly carcinogenic to humans based on epidemiological studies of childhood leukaemia. Evidence for all other cancers in children and adults, as well as other types of exposures (i.e. static fields and ELF electric fields) was considered not classifiable either due to insufficient or inconsistent scientific information.
>
> "Possibly carcinogenic to humans" is a classification used to denote an agent for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence for carcinogenicity in experimental animals.
>
> This classification is the weakest of three categories ("is carcinogenic to humans", "probably carcinogenic to humans" and "possibly carcinogenic to humans") used by IARC to classify potential carcinogens based on published scientific evidence. Some examples of well-known agents that have been classified by IARC are listed below:

Classification	Examples of Agents
Carcinogenic to humans (usually based on strong evidence of carcinogenicity in humans)	Asbestos Mustard gas Tobacco (smoked and smokeless) Gamma radiation
Probably carcinogenic to humans (usually based on strong evidence of carcinogenicity in animals)	Diesel engine exhaust Sun lamps UV radiation Formaldehyde
Possibly carcinogenic to humans (usually based on evidence in humans which is considered credible, but for which other explanations could not be ruled out)	Coffee Styrene Gasoline engine exhaust Pickled Vegetables ELF magnetic fields

DO ELF FIELDS CAUSE CANCER?

ELF fields are known to interact with tissues by inducing electric fields and currents in them. This is the only established mechanism of action of these fields. However, the electric currents induced by ELF fields commonly found in our environment are normally much lower than the strongest electric currents naturally occurring in the body such as those that control the beating of the heart.

Since 1979 when epidemiological studies first raised a concern about exposures to power line frequency magnetic fields and childhood cancer, a large number of studies have been conducted to determine if measured ELF exposure can influence cancer development, especially leukaemia in children.

There is no consistent evidence that exposure to ELF fields experienced in our living environment causes direct damage to biological molecules, including DNA. Since it seems unlikely that ELF fields could initiate cancer, a large number of investigations have been conducted to determine if ELF exposure can influence cancer promotion or co-promotion. Results from animal studies conducted so far suggest that ELF fields do not initiate or promote cancer.

However, two recent pooled analyses of epidemiological studies provide insight into the epidemiological evidence that played a pivotal role in the IARC evaluation. These studies suggest that, in a population exposed to average magnetic fields in excess of 0.3 to 0.4 μT, twice as many children might develop leukaemia compared to a population with lower exposures. In spite of the large number data base, some uncertainty remains as to whether magnetic field exposure or some other factor(s) might have accounted for the increased leukaemia incidence.

Childhood leukaemia is a rare disease with 4 out of 100,000 children between the age of 0 to 14 diagnosed every year. Also average magnetic field exposures above 0.3 or

0.4 μT in residences are rare. It can be estimated from the epidemiological study results that less than 1% of populations using 240 volt power supplies are exposed to these levels, although this may be higher in countries using 120 volt supplies.

The IARC review addresses the issue of whether it is feasible that ELF-EMF pose a cancer risk. The next step in the process is to estimate the likelihood of cancers in the general population from the usual exposures and to evaluate evidence for other (non-cancer) diseases. This part of the risk assessment should be finished by WHO in the next 18 months.

American Cancer Society

In the journal, *A Cancer Journal for Clinicians*, the American Cancer Society (ACS) reviewed EMF residential and occupational epidemiologic research in an article written by Dr. Clark W. Heath, Jr., ACS's vice president of epidemiology and surveillance research. Dr. Heath reviews 13 residential epidemiologic studies of adult and childhood cancer. Dr. Heath wrote:

> Evidence suggesting that exposure to EMF may or may not promote human carcinogenesis is mostly based on...epidemiologic observations.... While those observations may suggest such a relationship for leukemia and brain cancer in particular, the findings are weak, inconsistent, and inconclusive.... The weakness and inconsistent nature of epidemiologic data, combined with the continued dearth of coherent and reproducible findings from experimental laboratory research, leave one uncertain and rather doubtful that any real biologic link exists between EMF exposure and carcinogenicity.

American Medical Association

The AMA adopted recommendations of its Council on Scientific Affairs (CSA) regarding EMF health effects. The report was prepared as a result of a resolution passed by AMA's membership at its 1993 annual meeting. The following recommendations are based on the CSA's review of EMF epidemiologic and laboratory studies to date, as well as on several major literature reviews:

- Although no scientifically documented health risk has been associated with the usually occurring levels of electromagnetic fields, the AMA should continue to monitor developments and issues related to the subject.

- The AMA should encourage research efforts sponsored by agencies such as the National Institutes of Health, the U.S. Department of Energy, and the National Science Foundation. Continuing research should include study of exposures to EMF and its effects, average public exposures, occupational exposures, and the effects of field surges and harmonics.

- The AMA should support the meeting of an authoritative, multidisciplinary committee under the auspices of the National Academy of Sciences or the

National Council on Radiation Protection and Measurements to make recommendations about exposure levels of the public and workers to EMF and radiation.

References

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APPENDIX A.2

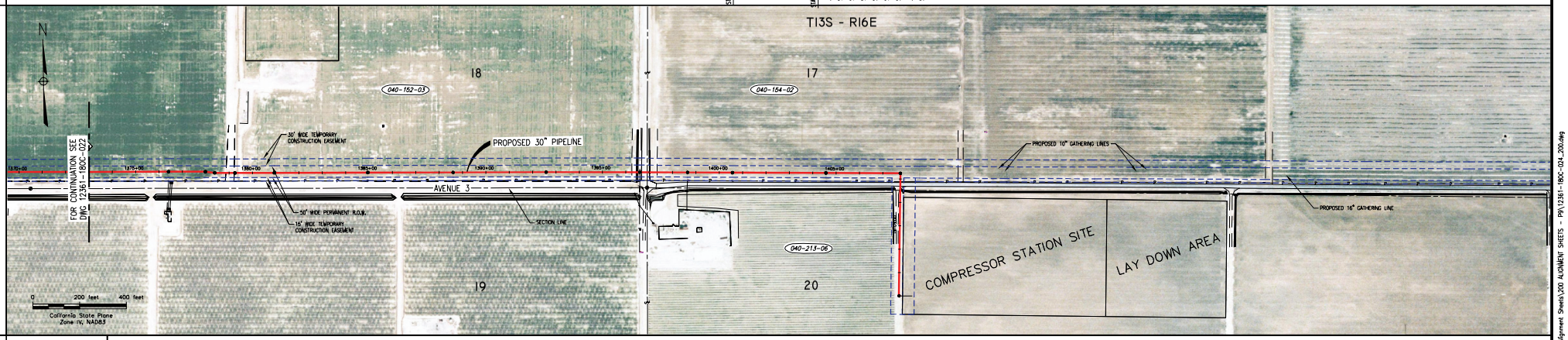
GAS PIPELINE ALIGNMENT SHEETS

OWNERSHIP	STA 1373+00.0	(040-182-03) CALIFORNIA VALLEY LAND COMPANY 2391.1 FEET/ 144.9 RODS	STA 1396+91.1	(040-184-02) NILUFARM LLC 1157.6 FEET/ 70.1 RODS	STA 1408+48.7 (040-215-06) SULLIVAN 459.0 FEET/ 27.8 RODS STA 1413+07.7
P/L DEPTH		PIPELINE DEPTH 5' TO T.O.P.			
ENVIRONMENTAL		SENSITIVE CULTURAL RESOURCES ARE IDENTIFIED IN THIS AREA. DETAILS ARE AVAILABLE TO QUALIFIED PERSONNEL UNDER SEPARATE COVER."			

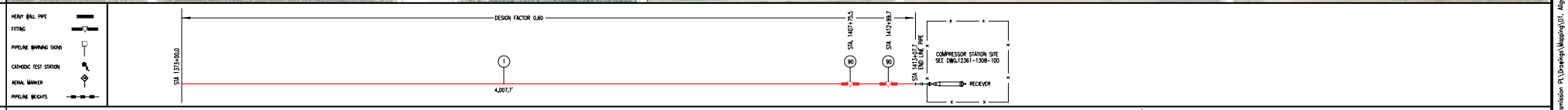
STATIONING

STA 1373+00.0	MATCH LINE			
STA 1376+40.5	POINT OF INTERSECTION	00°21'53" RT	638	
STA 1377+98.6	POINT OF INTERSECTION	07°10'54" RT	639	
STA 1378+38.6	POINT OF INTERSECTION	07°10'58" LT	640	
STA 1378+76.1	EXIT CROPS		641	
STA 1378+86.6	EDGE OF ROAD		642	
STA 1378+97.3	PUMP HEAD, 20' RT.		643	
STA 1379+22.2	EDGE OF ROAD		644	
STA 1379+25.3	POINT OF INTERSECTION	00°20'38" LT	645	
STA 1380+93.8	POINT OF INTERSECTION	00°00'51" LT	646	
STA 1384+94.4	POINT OF INTERSECTION	00°11'06" RT	647	
STA 1388+59.8	POINT OF INTERSECTION	00°10'46" LT	648	
STA 1392+58.2	POINT OF INTERSECTION	00°14'34" RT	649	
STA 1396+23.2	EXIT CROPS		650	
STA 1396+25.3	EDGE OF ROAD		651	
STA 1396+44.5	TOP OF SLOPE		652	
STA 1396+47.5	TOE OF SLOPE		653	
STA 1396+48.6	TOE OF SLOPE		654	
STA 1396+51.8	TOP OF SLOPE		655	
STA 1396+59.8	OH POWER LINE		656	
STA 1396+60.1	POINT OF INTERSECTION		657	
STA 1396+67.4	EDGE OF ROAD	00°17'24" RT	658	
STA 1396+91.1	SECTION LINE / PROPERTY LINE		659	
STA 1397+00.4	TOP OF SLOPE		660	
STA 1397+04.0	TOE OF SLOPE		661	
STA 1397+33.8	EDGE OF ROAD		662	
STA 1397+35.7	EXIT CROPS		663	
STA 1398+64.1	POINT OF INTERSECTION	00°02'30" LT	664	
STA 1400+36.2	POINT OF INTERSECTION	00°04'08" LT	665	
STA 1404+56.7	POINT OF INTERSECTION	00°00'29" RT	666	
STA 1407+75.5	POINT OF INTERSECTION	89°24'37" RT	675	
STA 1407+90.0	VEGETATION CHANGE		674	
STA 1408+10.5	OH POWER LINE		673	
STA 1408+15.1	EDGE OF PAVEMENT		672	
STA 1408+31.5	EDGE OF PAVEMENT		671	
STA 1408+44.7	EDGE OF ROAD		670	
STA 1408+48.7	SECTION LINE / PROPERTY LINE		669	
STA 1412+99.7	POINT OF INTERSECTION		667	
STA 1413+07.7	END SURVEY	88°59'52" LT	668	

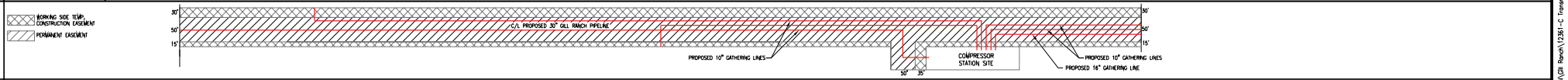
ALIGNMENT



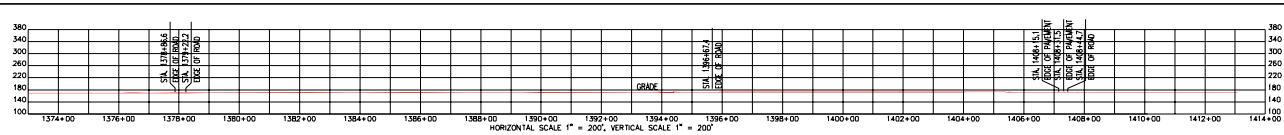
PIPELINE DATA



EASEMENT



PROFILE



ISSUED FOR REVIEW
MAY 29 2009
ForeRunner Corporation

SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 WLS FBE	4,007.7'
90	90° ELBOW, 3R (0.500" W.T.), CS, MSS SP-75, WPHY70	2
	TOTAL	4,007.7'

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-130B-100	COMPRESSOR FACILITY SITE PLAN
12361-180C-023	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P9	ISSUED FOR REVIEW	RS	5/29/09	CFE	5/29/09		
P8	ISSUED FOR REVIEW	SL	5/06/09				
P7	PRELIMINARY	SL	4/20/09				
P6	DRAWING NOT ISSUED						
P5	DRAWING NOT ISSUED						
P4	DRAWING NOT ISSUED						
P3	DRAWING NOT ISSUED						
P2	DRAWING NOT ISSUED						

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

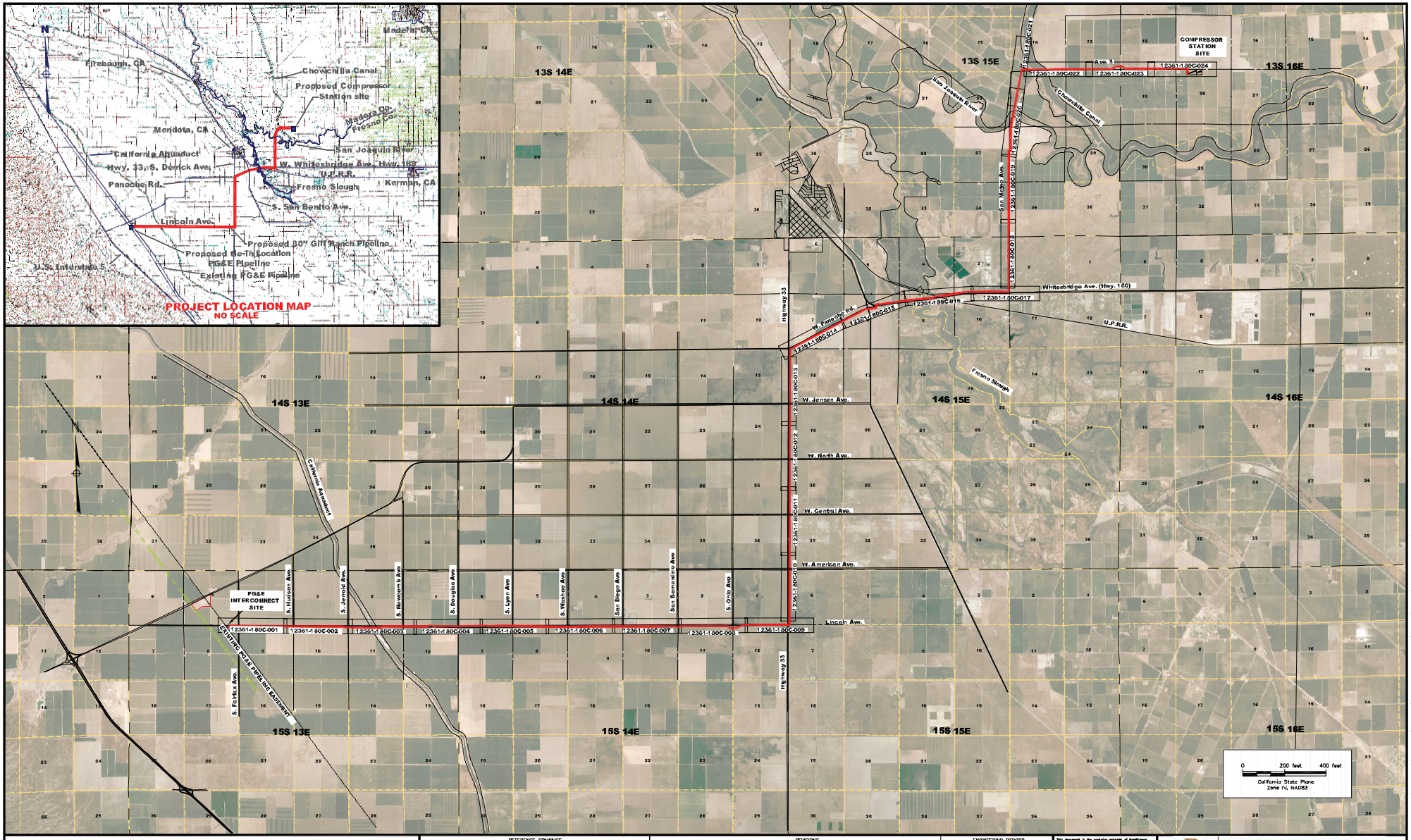
ForeRunner Corporation
Livermore, CA 94550

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 1373+00.0 TO 1413+07.7

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Madera Co., CA	12361-180C-024	P9

Plotted by: R.SUMRALD Date: 5/29/2009 4:01 PM Drawing: S:\Project Files\NW Natural\Gill Ranch\12361-C Transmission PL\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - PW\12361-180C-024_200.dwg



REFERENCE DRAWINGS			REVISIONS						ENGINEERING RECORD		
									DRAWN	PJD	2/18/08
									CHECKED		
		P6	RE-DRAWN – ISSUED FOR REVIEW	CFE	5/29/08	CFE	5/29/08		CLIENT		
		P5	ISSUED FOR PERMIT	PJD	5/27/08	CFE	5/27/08		PROJECT MGMT.		
		P4	PRELIMINARY	PJD	4/11/08	CFE	4/11/08		PROCESS		
		P3	PRELIMINARY	PJD	4/1/08	CFE	4/1/08		MECHANICAL		
		P2	PRELIMINARY	CFE	2/27/08	CFE	2/27/08		PIPING		
		P1	PRELIMINARY	PJD	2/18/08	CFE	2/18/08		STRUCTURAL		
DWG. NO.	TITLE	REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	ELECTRICAL		
									I & C		

ForeRunner Corporation

GILL RANCH STORAGE

GILL RANCH 30" PIPELINE ALIGNMENT COVER SHEET AND ALIGNMENT DRAWING INDEX

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
1"=4000'	12361-C	Fresno & Madera Co. CA	12361-180C-00A	P6

Plotted by: SJAURA Date: 5/29/2008 4:40 PM Drawing: S:\Project Files\NW Natural\Gill Ranch\12361-C Transmission PL\Drawings\Mapping\01. Alignment Sheets\X00 ALIGNMENT SHEETS - PW\12361-180C-001_X00COVERSHT.dwg

OWNERSHIP

STA 0+00.0

(027-060-67) DONALD NORTON, TRUSTEE OF THE M-B IRREVOCABLE TRUST UTD 11/15/1985 981.9 FEET/ 59.7 RODS (209)364-6106

STA 9+51.5

(027-060-65) BAKER, BARRY & BYRON 2654.0 FEET/ 159.6 RODS (209)364-6106

STA 35+85.3

(027-060-33) BEASLEY, DAVID TRUSTEE 1,520.0 FEET/ 80.0 RODS

STA 49+05.3

(027-060-18) BAKER, BARRY S. & MUSOOLAL, JUDITH U CO-TRUSTEES 694.7 FEET/ 35.0 RODS (209)364-6106

STA 55+00.0

P/L DEPTH

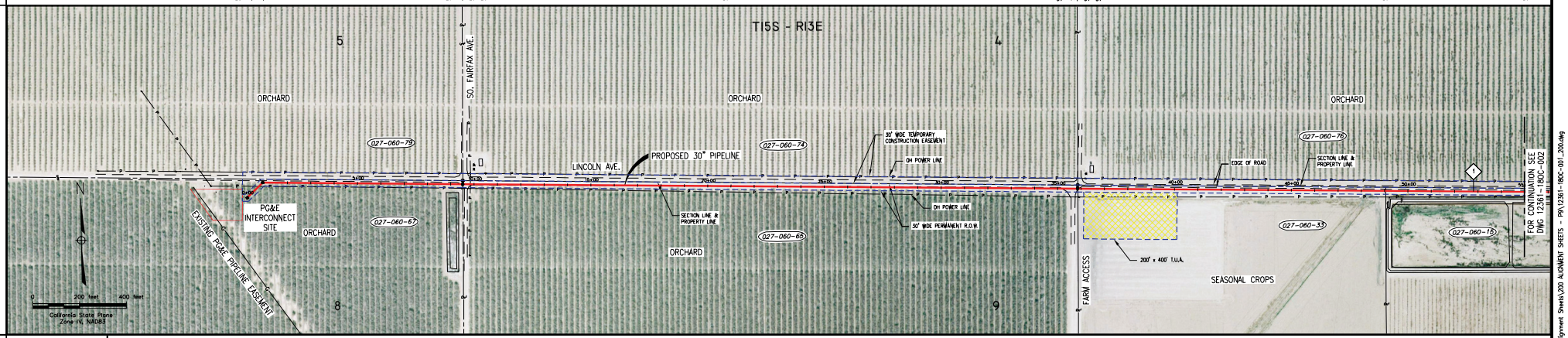
PIPELINE DEPTH 5' TO T.O.P.

ENVIRONMENTAL

STATIONING

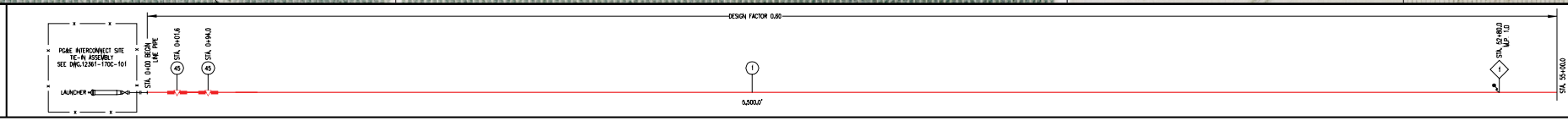
1 BEGIN SURVEY STA 0+00.0
2 POINT OF INTERSECTION STA 0+01.6
3 POINT OF INTERSECTION STA 0+94.0 — 45°00'47" LT / 45°01'05" RT
4 EDGE OF ROAD STA 9+42.4
5 POINT OF INTERSECTION STA 9+51.0 — 00°00'08" LT
6 SECTION LINE, PROPERTY LINE STA 9+51.5
7 OH POWER LINE STA 9+53.5
8 EDGE OF ROAD STA 20+73.5
9 EDGE OF ROAD STA 35+17.1
10 POINT OF INTERSECTION STA 35+85.0 — 07°07'14" RT
11 PROPERTY LINE STA 35+85.3
12 EDGE OF ROAD STA 35+87.3
13 PROPERTY LINE STA 49+05.3
MATCH LINE STA 55+00.0

ALIGNMENT



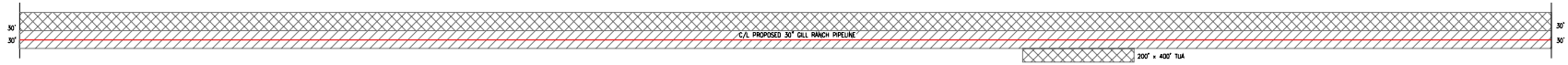
PIPELINE DATA

HEAVY WALL PIPE
FITTING
PIPELINE MARKING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS



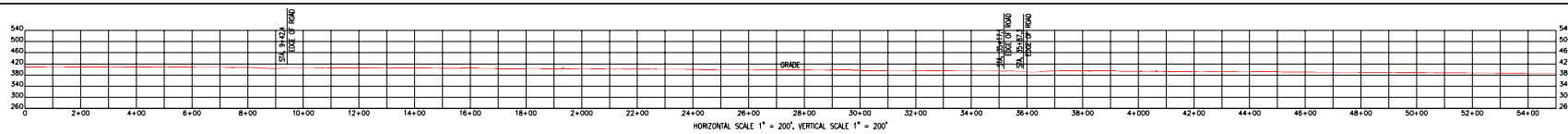
EASEMENT

WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT



PROFILE

ISSUED FOR REVIEW
MAY 29 2009
ForeRunner Corporation



SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 WLS FBE	5,500.0'
45	45° ELBOW, 3R (0.500" W.T.), CS, WSS SP-75, WPHY70	2
	CATHODIC TEST STATION	1

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-111	PG&E INTERCONNECT SITE - PLOT PLAN
12361-170C-101	PG&E TIE-IN ASSEMBLY PIPING DETAIL
12361-180C-002	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	APPR	DATE
P9	ISSUED FOR REVIEW	RS	5/29/09	CFE		5/29/09
P8	ISSUED FOR REVIEW	SL	5/06/09			
P7	PRELIMINARY / NEW SCALE	SL	4/20/09			
P6	ISSUE FOR PERMIT	MSP	1/8/08	CFE		1/8/08
P5	ISSUE FOR PERMIT	PJD	5/27/08	CFE		5/27/08
P4	PRELIMINARY	PJD	4/11/08	CFE		4/11/08
P3	PRELIMINARY	PJD	4/1/08	CFE		4/1/08
P2	PRELIMINARY	RC	2/27/08	CFE		2/27/08

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

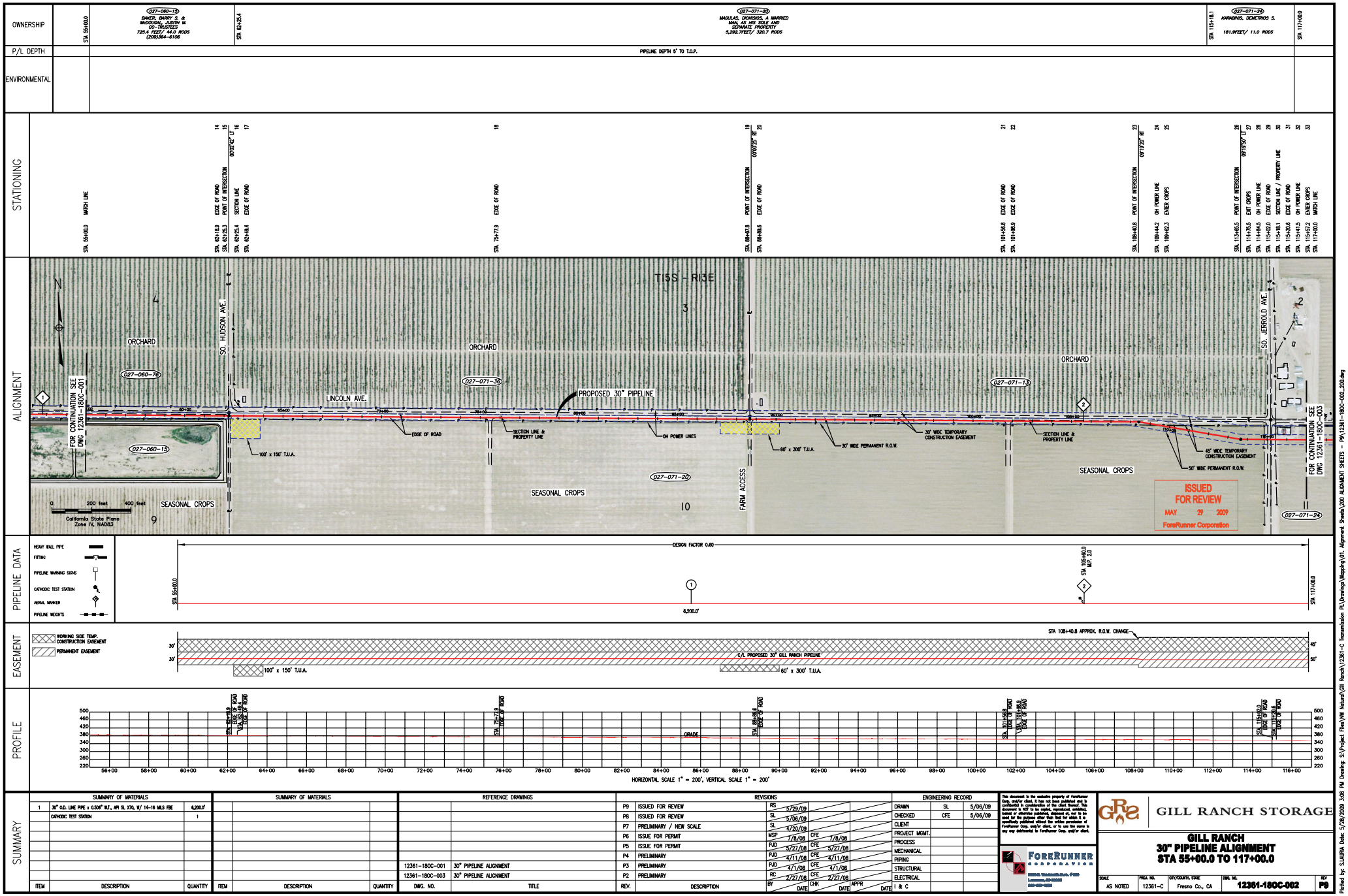
ForeRunner Corporation

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 0+00.0 TO 55+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Fresno Co., CA	12361-180C-001	P9

Plotted by: R.SCARVALO Date: 5/28/2009 3:07 PM DrawPrep: S:\Project Files\NW Natural\Gill Ranch\12361-C Transmission Pl\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - PRV\12361-180C-001_200.dwg


OWNERSHIP
STA 55+00.0
(027-060-15)
BAKER, BARRY S. & McDOUGAL, JUDITH M.
CO-TRUSTEES
725.4 FEET/ 44.0 RODS
(209)364-6106
STA 62+25.4
(027-071-20)
MAGULAS, DIONISIOS, A MARRIED MAN, AS HIS SOLE AND SEPARATE PROPERTY
5,292.7FEET/ 320.7 RODS
STA 115+18.1
(027-071-24)
KARABINIS, DEMETRIOS S.
161.9FEET/ 11.0 RODS
STA 117+00.0
P/L DEPTH
PIPELINE DEPTH 5' TO T.O.P.
ENVIRONMENTAL
STATIONING
MATCH LINE
STA 55+00.0
EDGE OF ROAD
POINT OF INTERSECTION
SECTION LINE
STA 62+18.8
STA 62+25.3
STA 62+25.4
STA 62+49.4
STA 75+77.9
STA 89+47.8
STA 89+89.6
STA 101+45.8
STA 101+85.9
STA 108+40.8
STA 109+44.2
STA 109+82.3
STA 113+65.5
STA 114+75.5
STA 114+84.5
STA 115+42.0
STA 115+81.1
STA 115+20.6
STA 115+41.5
STA 115+57.2
STA 117+00.0
ENTER CROPS
EXIT CROPS
OH POWER LINE
SECTION LINE / PROPERTY LINE
ALIGNMENT
T15S - R13E
ORCHARD
SEASONAL CROPS
SO. HUDSON AVE.
SO. JERROLD AVE.
LINCOLN AVE.
FARM ACCESS
PROPOSED 30" PIPELINE
FOR CONTINUATION SEE DWG 12361-180C-001
FOR CONTINUATION SEE DWG 12361-180C-003
(027-060-76)
(027-060-15)
(027-071-36)
(027-071-20)
(027-071-13)
(027-071-24)
EDGE OF ROAD
SECTION LINE & PROPERTY LINE
OH POWER LINES
100' x 150' T.U.A.
60' x 300' T.U.A.
30' WIDE PERMANENT R.O.W.
30' WIDE TEMPORARY CONSTRUCTION EASEMENT
45' WIDE TEMPORARY CONSTRUCTION EASEMENT
50' WIDE PERMANENT R.O.W.
0 200 feet 400 feet
California State Plane Zone IV, NAD83
ISSUED FOR REVIEW
MAY 29 2009
ForeRunner Corporation
PIPELINE DATA
HEAVY WALL PIPE
FITTING
PIPELINE WARNING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS
DESIGN FACTOR 0.60
STA 55+00.0
STA 105+60.0 M.P. 2.0
STA 117+00.0
6,200.0'
EASEMENT
WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT
STA 108+40.8 APPROX. R.O.W. CHANGE
30'
45'
50'
C/L PROPOSED 30" GILL RANCH PIPELINE
100' x 150' T.U.A.
60' x 300' T.U.A.
PROFILE
GRADE
500
460
420
380
340
300
260
220
56+00 58+00 60+00 62+00 64+00 66+00 68+00 70+00 72+00 74+00 76+00 78+00 80+00 82+00 84+00 86+00 88+00 90+00 92+00 94+00 96+00 98+00 100+00 102+00 104+00 106+00 108+00 110+00 112+00 114+00 116+00
HORIZONTAL SCALE 1" = 200', VERTICAL SCALE 1" = 200'
SUMMARY
SUMMARY OF MATERIALS
ITEM 1 | DESCRIPTION: 30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 MILS FBE | QUANTITY: 6,200.0'
ITEM CATHODIC TEST STATION | QUANTITY: 1
ITEM | DESCRIPTION | QUANTITY
SUMMARY OF MATERIALS
ITEM | DESCRIPTION | QUANTITY
REFERENCE DRAWINGS
DWG. NO. | TITLE
12361-180C-001 | 30" PIPELINE ALIGNMENT
12361-180C-003 | 30" PIPELINE ALIGNMENT
REVISIONS
REV. | DESCRIPTION | BY | DATE | CHK | APPR
P9 | ISSUED FOR REVIEW | RS | 5/29/09
P8 | ISSUED FOR REVIEW | SL | 5/06/09 | CFE | 5/06/09
P7 | PRELIMINARY / NEW SCALE | SL | 4/20/09
P6 | ISSUE FOR PERMIT | MSP | 1/8/08 | CFE | 1/8/08
P5 | ISSUE FOR PERMIT | PJD | 5/27/08 | CFE | 5/27/08
P4 | PRELIMINARY | PJD | 4/11/08 | CFE | 4/11/08
P3 | PRELIMINARY | PJD | 4/1/08 | CFE | 4/1/08
P2 | PRELIMINARY | RC | 2/27/08 | CFE | 2/27/08
ENGINEERING RECORD
DRAWN SL 5/06/09
CHECKED CFE 5/06/09
CLIENT
PROJECT MGMT.
PROCESS
MECHANICAL
PIPING
STRUCTURAL
ELECTRICAL
I & C
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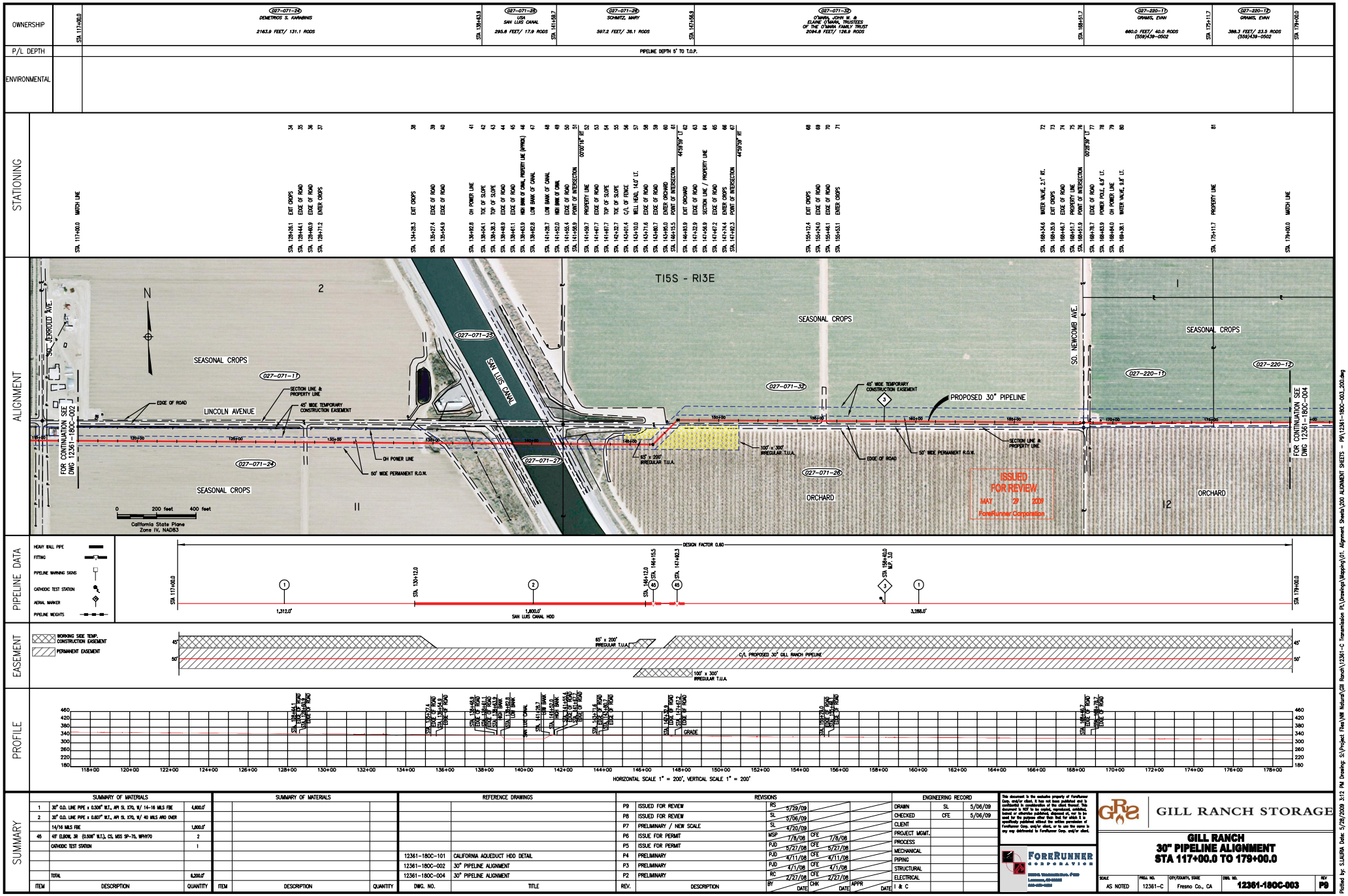
FORERUNNER CORPORATION
GILL RANCH STORAGE
GILL RANCH
30" PIPELINE ALIGNMENT
STA 55+00.0 TO 117+00.0
SCALE: AS NOTED
PROJ. NO.: 12361-C
CITY/COUNTY, STATE: Fresno Co., CA
DWG. NO.: 12361-180C-002
REV: P9
Plotted by: S.LAURA Date: 5/29/2009 3:08 PM Drawing: G:\Project Files\WIP Network\Gill Ranch\12361-C Transmission P/L\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - P9\12361-180C-002_200.dwg


OWNERSHIP
P/L DEPTH
ENVIRONMENTAL
STATIONING
ALIGNMENT
PIPELINE DATA
EASEMENT
PROFILE
SUMMARY
027-071-24
DEMETRIOS S. KARABINIS
2163.9 FEET/ 131.1 RODS
027-071-25
USA
SAN LUIS CANAL
295.6 FEET/ 17.9 RODS
027-071-26
SCHMITZ, MARY
397.2 FEET/ 36.1 RODS
027-071-32
O'BANION, JOHN W. &
ELAINE O'MARA, TRUSTEES
OF THE O'MARA FAMILY TRUST
2084.8 FEET/ 126.8 RODS
027-220-11
GRAMIS, EVAN
660.0 FEET/ 40.0 RODS
(559)439-0502
027-220-12
GRAMIS, EVAN
388.3 FEET/ 23.5 RODS
(559)439-0502
PIPELINE DEPTH 5' TO T.O.P.
T15S - R13E
SEASONAL CROPS
ORCHARD
LINCOLN AVENUE
SO. JERROLD AVE.
SO. NEWCOMB AVE.
SAN LUIS CANAL
EDGE OF ROAD
SECTION LINE & PROPERTY LINE
45' WIDE TEMPORARY CONSTRUCTION EASEMENT
50' WIDE PERMANENT R.O.W.
OH POWER LINE
PROPOSED 30" PIPELINE
65' x 200' IRREGULAR T.U.A.
100' x 300' IRREGULAR T.U.A.
FOR CONTINUATION SEE DWG 12361-180C-002
FOR CONTINUATION SEE DWG 12361-180C-004
ISSUED FOR REVIEW
MAY 27 2009
ForeRunner Corporation
0 200 feet 400 feet
California State Plane
Zone IV, NAD83
HEAVY WALL PIPE
FITTING
PIPELINE WARNING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS
DESIGN FACTOR 0.60
1,312.0'
1,400.0'
SAN LUIS CANAL HDD
3,288.0'
WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT
C/L PROPOSED 30" GILL RANCH PIPELINE
GRADE
HORIZONTAL SCALE 1" = 200', VERTICAL SCALE 1" = 200'
SUMMARY OF MATERIALS
ITEM DESCRIPTION QUANTITY
1 30" O.D. LINE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE 4,400.0'
2 30" O.D. LINE PIPE x 0.607" W.T., API 5L X70, W/ 40 MILS ARO OVER 14/16 MILS FBE 1,800.0'
45 45° ELBOW, 3R (0.506" W.T.), CS, MSS SP-75, WPHY70 2
CATHODIC TEST STATION 1
TOTAL 6,200.0'
SUMMARY OF MATERIALS
ITEM DESCRIPTION QUANTITY
REFERENCE DRAWINGS
DWG. NO. TITLE
12361-180C-101 CALIFORNIA AQUEDUCT HDD DETAIL
12361-180C-002 30" PIPELINE ALIGNMENT
12361-180C-004 30" PIPELINE ALIGNMENT
REVISIONS
REV. DESCRIPTION BY DATE CHK APPR DATE
P9 ISSUED FOR REVIEW RS 5/29/09
P8 ISSUED FOR REVIEW SL 5/06/09
P7 PRELIMINARY / NEW SCALE SL 4/30/09
P6 ISSUE FOR PERMIT MSP 1/8/08 CFE 1/8/08
P5 ISSUE FOR PERMIT PJD 5/27/08 CFE 5/27/08
P4 PRELIMINARY PJD 4/11/08 CFE 4/11/08
P3 PRELIMINARY PJD 4/1/08 CFE 4/1/08
P2 PRELIMINARY RC 2/27/08 CFE 2/27/08
ENGINEERING RECORD
DRAWN SL 5/06/09
CHECKED CFE 5/06/09
CLIENT
PROJECT MGMT.
PROCESS
MECHANICAL
PIPING
STRUCTURAL
ELECTRICAL
I & C
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ForeRunner Corporation
GILL RANCH STORAGE
GILL RANCH
30" PIPELINE ALIGNMENT
STA 117+00.0 TO 179+00.0
SCALE AS NOTED
PROJ. NO. 12361-C
CITY/COUNTY, STATE Fresno Co., CA
DWG. NO. 12361-180C-003
REV P9
Plotted by: S.LAURA Date: 5/29/2009 3:12 PM Drawing: S:\Project Files\WIP Network\Gill Ranch\12361-C Transmission P/L\Drawings\Mapping\Gr. Alignment Sheets\200 ALIGNMENT SHEETS - P9\12361-180C-003_200.dwg

SUMMARY	PROFILE	EASEMENT	PIPELINE DATA	ALIGNMENT	STATIONING	ENVIRONMENTAL	P/L DEPTH	OWNERSHIP

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.506" W.T. API 5L X70, W/ 14-16 MILS FBE	6,200.0'
	CATHODIC TEST STATION	1

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-003	30" PIPELINE ALIGNMENT
12361-180C-005	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P9	ISSUED FOR REVIEW	RS	5/29/09				
P8	ISSUED FOR REVIEW	SL	5/06/09				
P7	PRELIMINARY / NEW SCALE	SL	4/20/09				
P6	ISSUE FOR PERMIT	MSP	7/8/08	CFE	7/8/08		
P5	ISSUE FOR PERMIT	PJD	5/27/08	CFE	5/27/08		
P4	PRELIMINARY	PJD	4/11/08	CFE	4/11/08		
P3	PRELIMINARY	RC	4/11/08	CFE	4/11/08		
P2	PRELIMINARY	RC	2/27/08	CFE	2/27/08		

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

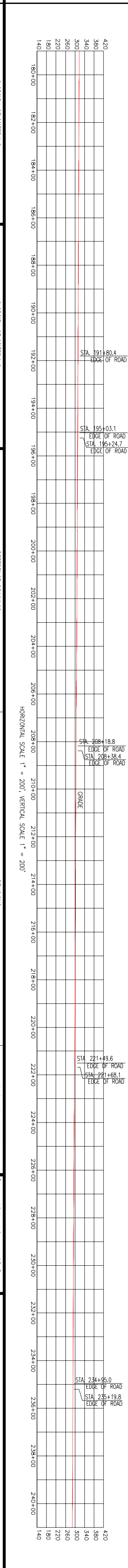
FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 179+00.0 TO 241+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Fresno Co., CA	12361-180C-004	P9

PROFILE



HORIZONTAL SCALE 1" = 200', VERTICAL SCALE 1" = 200'

EASEMENT

BORING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT

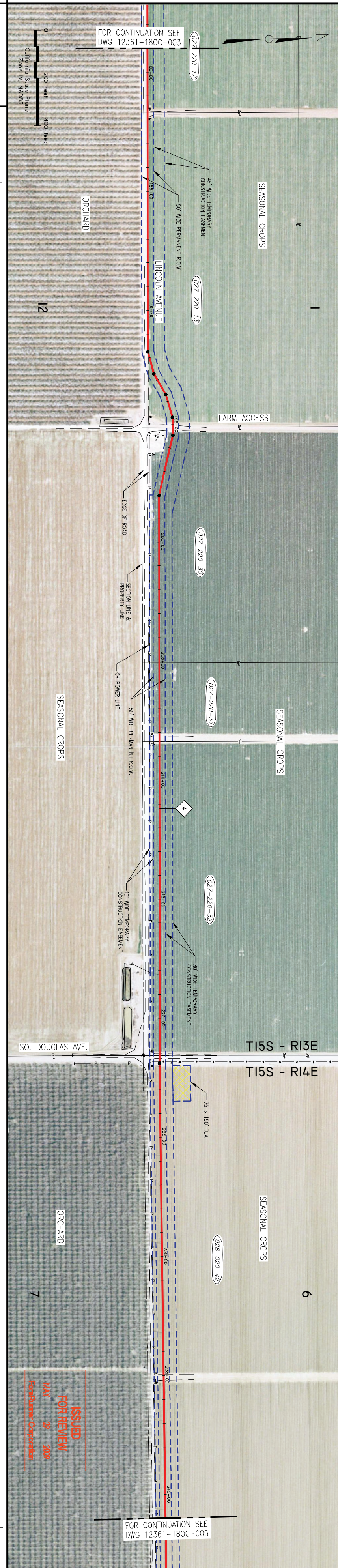
STA. 198+05.2 APPROX. WORK SPACE CHANGE
C/L PROPOSED 30" GILL RANCH PIPELINE
75' x 150' TUA

PIPELINE DATA

HEAVY WALL PIPE
FITTING
PIPELINE MARKING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS

STA 179+00.0
6,200.0'
STA 211+20.0 M.P. 4.0
DESIGN FACTOR 0.60
STA 241+00.0

ALIGNMENT



STATIONING

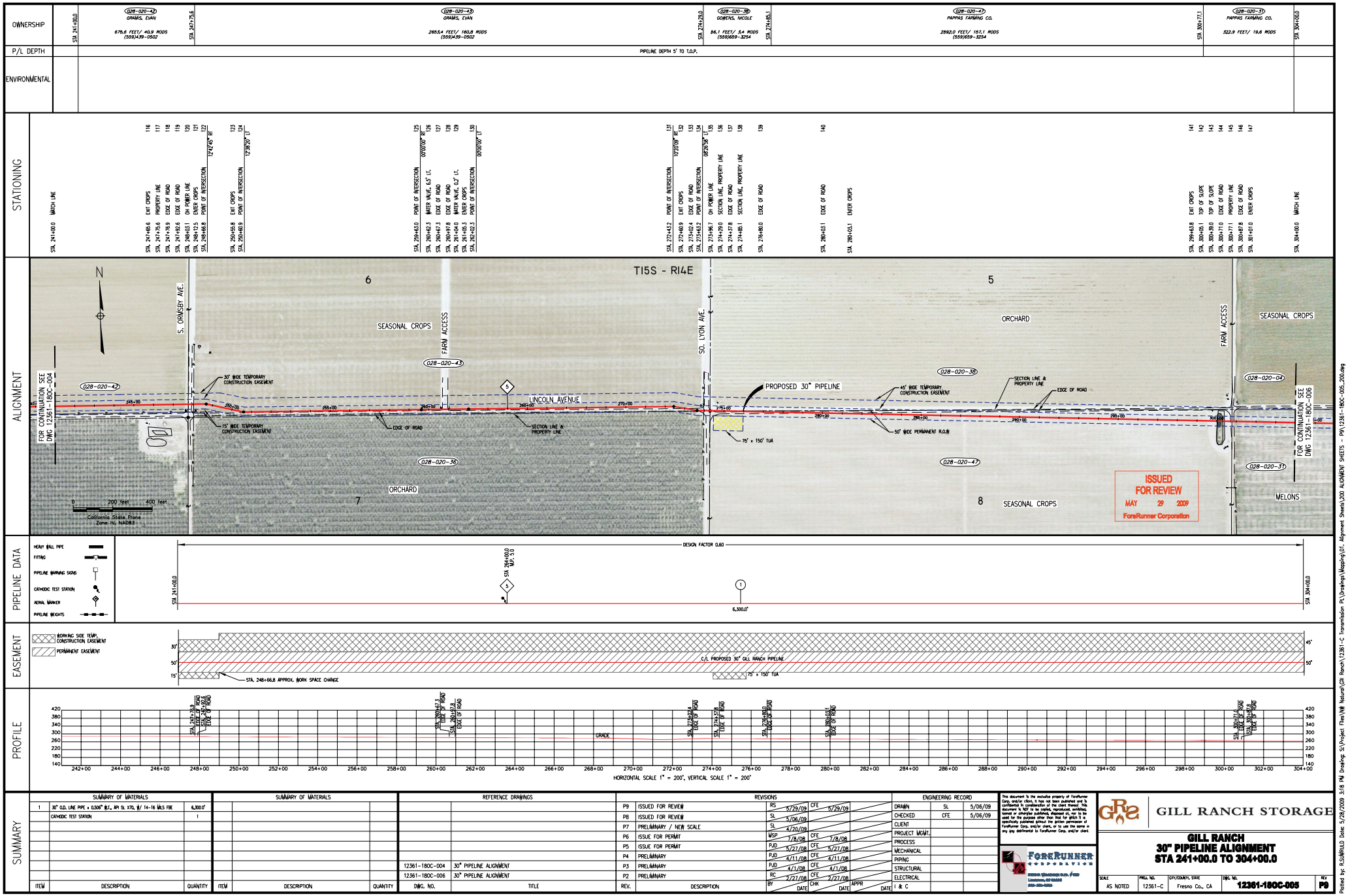
STATION	DESCRIPTION	NO.
STA. 179+00.0	MATCH LINE	
STA. 181+53.0	WATER VALVE, 9.0' LT.	82
STA. 181+71.7	PROPERTY LINE	83
STA. 181+95.3	WATER VALVE, 8.4' LT.	84
STA. 191+73.5	POINT OF INTERSECTION	85
	14°59'58" LT	
STA. 191+80.4	EDGE OF ROAD	86
STA. 191+92.6	ENTER CROPS	87
STA. 192+69.8	POINT OF INTERSECTION	88
STA. 193+69.8	POINT OF INTERSECTION	89
	15°00'01" LT	
	13°49'37" RT	
STA. 194+69.8	POINT OF INTERSECTION	90
	00°00'00" LT	
STA. 194+97.6	EXIT CROPS	91
STA. 195+03.1	EDGE OF ROAD	92
STA. 195+10.9	PROPERTY LINE	93
STA. 195+24.7	EDGE OF ROAD	94
STA. 195+39.8	ENTER CROPS	95
STA. 195+45.9	POINT OF INTERSECTION	96
	14°16'45" RT	
STA. 198+05.2	POINT OF INTERSECTION	97
	13°03'04" LT	
STA. 205+07.8	PROPERTY LINE	98
STA. 208+09.7	EXIT CROPS	99
STA. 208+18.8	EDGE OF ROAD	100
STA. 208+37.8	PROPERTY LINE	101
STA. 208+38.4	EDGE OF ROAD	102
STA. 208+47.4	ENTER CROPS	103
STA. 221+36.0	EXIT CROPS	104
STA. 221+49.6	EDGE OF ROAD	105
STA. 221+56.6	RANGE, SECTION & PROPERTY LINE	106
STA. 221+68.1	EDGE OF ROAD	107
STA. 221+82.5	WATER LINE	108
STA. 221+87.7	OH POWER LINE	109
STA. 221+88.1	POINT OF INTERSECTION	110
	00°45'24" LT	
STA. 221+98.6	ENTER CROPS	111
STA. 234+87.4	EXIT CROPS	112
STA. 234+95.0	EDGE OF ROAD	113
STA. 235+19.8	EDGE OF ROAD	114
STA. 241+00.0	MATCH LINE	

P/L DEPTH

PIPELINE DEPTH 5' TO T.O.P.

OWNERSHIP

STATION	OWNER
STA 179+00.0	(027-220-12) GRAMIS, EVAN; 271.7 FEET/ 16.5 RODS; (559)439-0502
STA 181+71.7	(027-220-13) GRAMIS, EVAN; 1339.2 FEET/ 81.2 RODS; (559)439-0502
STA 195+10.9	(027-220-30) GRAMIS, EVAN; 996.9 FEET/ 60.4 RODS; (559)439-0502
STA 205+07.8	(027-220-31) GRAMIS, EVAN; 330.0 FEET/ 20.0 RODS; (559)439-0502
STA 208+37.8	(027-220-32) CHRISTOPHER, SOTIRIS STEFANOPOULOS & ELENA STEFANOPOULOS, TRUSTEES OF THE AIR JEANNE STEFANOPOULOS TRUST; 1318.8 FEET/ 79.9 RODS
STA 221+56.6	(028-020-42) GRAMIS, EVAN; 1943.4 FEET/ 117.8 RODS; (559)439-0502
STA 241+00.0	


OWNERSHIP
STA 241+00.0
(028-020-42) GRAMS, EVAN
676.6 FEET/ 40.9 RODS (559)439-0502
STA 247+76.6
(028-020-43) GRAMS, EVAN
2655.4 FEET/ 160.8 RODS (559)439-0502
STA 274+29.0
(028-020-38) GOMENS, NICOLE
86.1 FEET/ 5.4 RODS (559)659-3254
STA 274+85.1
(028-020-47) PAPPAS FARMING CO.
2892.0 FEET/ 167.1 RODS (559)659-3254
STA 300+77.1
(028-020-31) PAPPAS FARMING CO.
322.9 FEET/ 19.6 RODS
STA 304+00.0
P/L DEPTH
PIPELINE DEPTH 5' TO T.O.P.
ENVIRONMENTAL
STATIONING
STA 241+00.0 MATCH LINE
STA 247+65.6 EXIT CROPS
STA 247+75.6 PROPERTY LINE
STA 247+78.9 EDGE OF ROAD
STA 247+92.6 EDGE OF ROAD
STA 248+03.1 OH POWER LINE
STA 248+12.5 ENTER CROPS
STA 248+66.8 POINT OF INTERSECTION 12°42'45" RT
STA 250+55.8 EXIT CROPS
STA 250+80.9 POINT OF INTERSECTION 12°38'20" LT
STA 259+43.0 POINT OF INTERSECTION 00°00'00" RT
STA 260+62.3 WATER VALVE, 6.5' LT.
STA 260+67.3 EDGE OF ROAD
STA 260+97.8 EDGE OF ROAD
STA 261+04.0 WATER VALVE, 10.2' LT.
STA 261+65.3 ENTER CROPS
STA 262+62.5 POINT OF INTERSECTION 00°00'00" LT
STA 272+43.2 POINT OF INTERSECTION 10°00'09" RT
STA 272+60.9 EXIT CROPS
STA 273+02.4 EDGE OF ROAD
STA 273+43.2 POINT OF INTERSECTION 08°26'58" LT
STA 273+96.7 OH POWER LINE
STA 274+29.0 SECTION LINE, PROPERTY LINE
STA 274+37.8 EDGE OF ROAD
STA 274+85.1 SECTION LINE, PROPERTY LINE
STA 276+80.0 EDGE OF ROAD
STA 280+03.1 EDGE OF ROAD
STA 280+03.1 ENTER CROPS
STA 299+43.8 EXIT CROPS
STA 300+05.1 TOP OF SLOPE
STA 300+39.0 TOP OF SLOPE
STA 300+71.0 EDGE OF ROAD
STA 300+77.1 PROPERTY LINE
STA 300+87.8 EDGE OF ROAD
STA 301+01.0 ENTER CROPS
STA 304+00.0 MATCH LINE
ALIGNMENT
N
T15S - R14E
S. ORMSBY AVE.
SEASONAL CROPS
FARM ACCESS
SO. LYON AVE.
ORCHARD
SEASONAL CROPS
FARM ACCESS
SEASONAL CROPS
(028-020-42)
(028-020-43)
(028-020-36)
(028-020-38)
(028-020-47)
(028-020-04)
(028-020-31)
FOR CONTINUATION SEE DWG 12361-180C-004
FOR CONTINUATION SEE DWG 12361-180C-006
30' WIDE TEMPORARY CONSTRUCTION EASEMENT
15' WIDE TEMPORARY CONSTRUCTION EASEMENT
EDGE OF ROAD
SECTION LINE & PROPERTY LINE
LINCOLN AVENUE
PROPOSED 30" PIPELINE
45' WIDE TEMPORARY CONSTRUCTION EASEMENT
50' WIDE PERMANENT R.O.W.
75' x 150' TUA
ISSUED FOR REVIEW
MAY 29 2009
ForeRunner Corporation
MELONS
0 200 feet 400 feet
California State Plane Zone IV, NAD83
PIPELINE DATA
HEAVY WALL PIPE
FITTING
PIPELINE MARKING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS
DESIGN FACTOR 0.60
STA 241+00.0
STA 264+00.0 MAP. 5.0
6,300.0'
STA 304+00.0
EASEMENT
WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT
30'
50'
15'
45'
50'
C/L PROPOSED 30" GILL RANCH PIPELINE
STA. 248+66.8 APPROX. WORK SPACE CHANGE
75' x 150' TUA
PROFILE
GRADE
HORIZONTAL SCALE 1" = 200', VERTICAL SCALE 1" = 200'
SUMMARY
SUMMARY OF MATERIALS
1 30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 MILS FBE 6,300.0'
CATHODIC TEST STATION 1
ITEM DESCRIPTION QUANTITY
SUMMARY OF MATERIALS
ITEM DESCRIPTION QUANTITY
REFERENCE DRAWINGS
12361-180C-004 30" PIPELINE ALIGNMENT
12361-180C-006 30" PIPELINE ALIGNMENT
DWG. NO. TITLE
REVISIONS
P9 ISSUED FOR REVIEW RS 5/29/09 CFE 5/29/09
P8 ISSUED FOR REVIEW SL 5/06/09
P7 PRELIMINARY / NEW SCALE SL 4/20/09
P6 ISSUE FOR PERMIT MSP 7/8/08 CFE 7/8/08
P5 ISSUE FOR PERMIT PJD 5/27/08 CFE 5/27/08
P4 PRELIMINARY PJD 4/11/08 CFE 4/11/08
P3 PRELIMINARY PJD 4/1/08 CFE 4/1/08
P2 PRELIMINARY RC 2/27/08 CFE 2/27/08
REV. DESCRIPTION BY DATE CHK APPR DATE
ENGINEERING RECORD
DRAWN SL 5/06/09
CHECKED CFE 5/06/09
CLIENT
PROJECT MGMT.
PROCESS
MECHANICAL
PIPING
STRUCTURAL
ELECTRICAL
I & C
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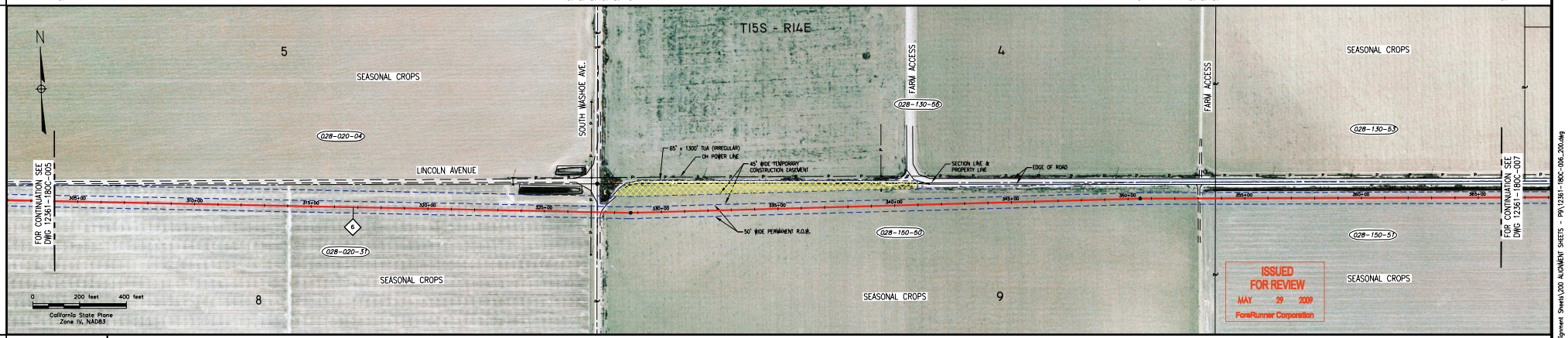
ForeRunner Corporation
GILL RANCH STORAGE
GILL RANCH
30" PIPELINE ALIGNMENT
STA 241+00.0 TO 304+00.0
SCALE AS NOTED
PROJ. NO. 12361-C
CITY/COUNTY, STATE Fresno Co., CA
DWG. NO. 12361-180C-005
REV P9
Plotted by: R.SUMPOLD Date: 5/29/2009 3:18 PM DrawPrep: S:\Project Files\NW Reburn\Gill Ranch\12361-C Transmission Pl\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - PRV\12361-180C-005_200.dwg

OWNERSHIP	STA 304+00.0	(028-020-37) PAPPAS FARMING CO. 2,297.9 FEET/ 139.3 RODS	STA 326+97.9	(028-150-50) WESTLANDS WATER DIST. 2,676.6 FEET/ 162.2 RODS
	STA 353+74.5	(028-150-51) WESTLANDS WATER DIST 1,226.0 FEET/ 74.3 RODS (559)241-6233	STA 366+00.0	
P/L DEPTH	PIPELINE DEPTH 5' TO T.O.P.			
ENVIRONMENTAL				

STATIONING

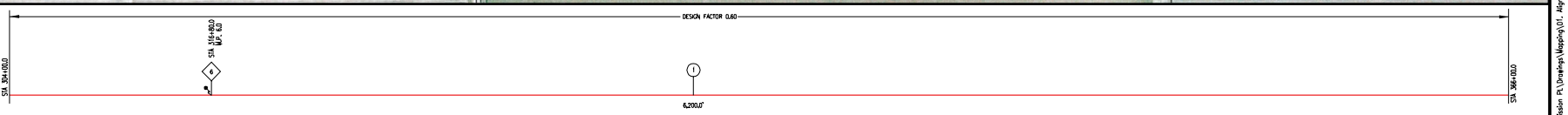
STA 304+00.0 MATCH LINE
148 STA 326+80.0 CNT CROSS
149 STA 326+99.6 CH POWER LINE
150 STA 327+25.3 SECTION LINE, PROPERTY LINE
151 STA 327+26.2 EDGE OF ROAD
152 STA 327+43.0 EDGE OF ROAD
153 STA 329+68.5 POINT OF INTERSECTION 02°45'58" LT
154 STA 350+52.1 POINT OF INTERSECTION 01°26'58" RT
155 STA 353+93.8 EDGE OF ROAD
156 STA 353+07.4 EDGE OF ROAD
157 STA 353+74.5 PROPERTY LINE
STA 366+00.0 MATCH LINE

ALIGNMENT



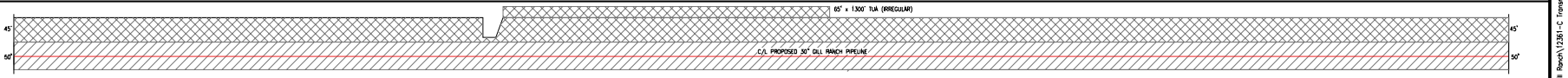
PIPELINE DATA

HEAVY WALL PIPE
FITTING
PIPELINE MARKING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS

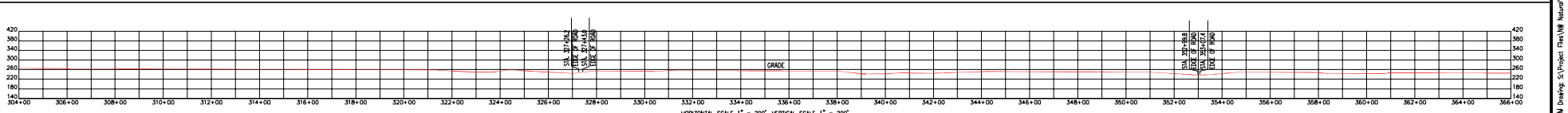


EASEMENT

WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT



PROFILE



SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 MILS FBE	6,200.0'
	CATHODIC TEST STATION	1

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-005	30" PIPELINE ALIGNMENT
12361-180C-007	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	APPR
P9	ISSUED FOR REVIEW	RS	5/29/09	CFE	5/29/09
P8	ISSUED FOR REVIEW	SL	5/06/09		
P7	PRELIMINARY / NEW SCALE	SL	4/20/09		
P6	ISSUE FOR PERMIT	MSP	7/8/08	CFE	7/8/08
P5	ISSUE FOR PERMIT	PJD	5/27/08	CFE	5/27/08
P4	PRELIMINARY	PJD	4/11/08	CFE	4/11/08
P3	PRELIMINARY	PJD	4/1/08	CFE	4/1/08
P2	PRELIMINARY	RC	2/27/08	CFE	2/27/08

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

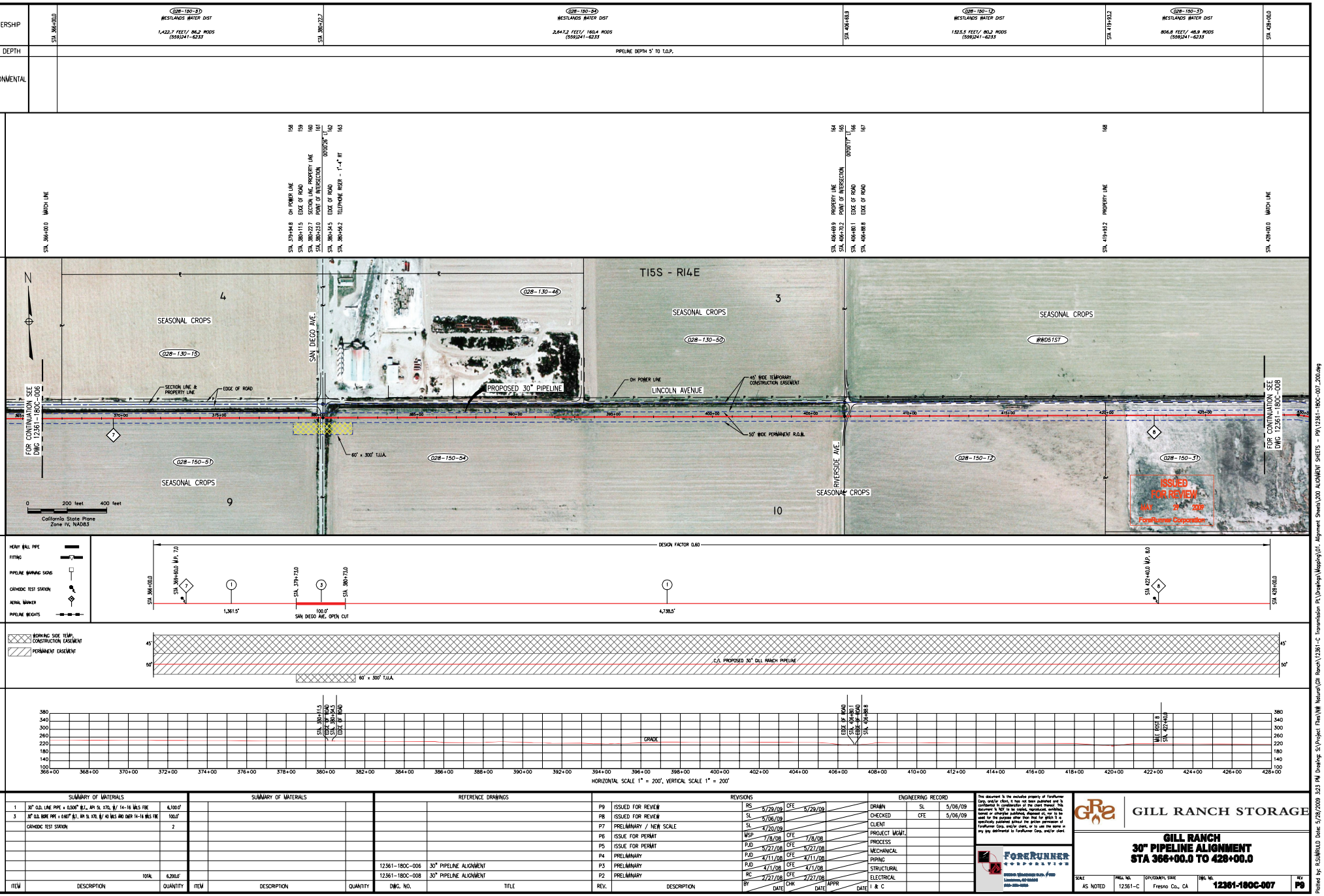
ForeRunner Corporation
Livermore, CA 94550
925-960-9990

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 304+00.0 TO 366+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Fresno Co., CA	12361-180C-006	P9

Plotted by: R.SCARNULO Date: 5/28/2009 3:21 PM DrawPrep: S:\Project Files\NW Returns\Gill Ranch\12361-C Transmission Pl.\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - PSV\12361-180C-006_200.dwg


OWNERSHIP
STA 366+00.0
(028-180-01) WESTLANDS WATER DIST 1,422.7 FEET/ 86.2 RODS (559)241-6233
STA 380+22.7
(028-180-04) WESTLANDS WATER DIST 2,647.2 FEET/ 160.4 RODS (559)241-6233
STA 406+69.9
(028-180-12) WESTLANDS WATER DIST 1,323.5 FEET/ 80.2 RODS (559)241-6233
STA 419+93.2
(028-180-31) WESTLANDS WATER DIST 806.8 FEET/ 48.9 RODS (559)241-6233
STA 428+00.0
P/L DEPTH
PIPELINE DEPTH 5' TO T.O.P.
ENVIRONMENTAL
STATIONING
STA 366+00.0 MATCH LINE
STA 379+94.8 OH POWER LINE
STA 380+11.5 EDGE OF ROAD
STA 380+22.7 SECTION LINE, PROPERTY LINE
STA 380+23.0 POINT OF INTERSECTION
STA 380+34.5 EDGE OF ROAD
STA 380+56.2 TELEPHONE RISER - 1'-4" ht
STA 406+69.9 PROPERTY LINE
STA 406+70.2 POINT OF INTERSECTION
STA 406+80.1 EDGE OF ROAD
STA 406+88.8 EDGE OF ROAD
STA 419+93.2 PROPERTY LINE
STA 428+00.0 MATCH LINE
ALIGNMENT
T15S - R14E
SEASONAL CROPS
SAN DIEGO AVE.
LINCOLN AVENUE
RIVERSIDE AVE.
WWD51ST
PROPOSED 30" PIPELINE
OH POWER LINE
45' WIDE TEMPORARY CONSTRUCTION EASEMENT
50' WIDE PERMANENT R.O.W.
60' x 300' T.U.A.
SECTION LINE & PROPERTY LINE
EDGE OF ROAD
028-130-15
028-130-46
028-130-50
028-150-51
028-150-54
028-150-17
028-150-31
FOR CONTINUATION SEE DWG 12361-180C-006
FOR CONTINUATION SEE DWG 12361-180C-008
0 200 feet 400 feet
California State Plane Zone IV, NAD83
ISSUED FOR REVIEW
MAY 29 2009
ForeRunner Corporation
PIPELINE DATA
HEAVY WALL PIPE
FITTING
PIPELINE MARKING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS
DESIGN FACTOR 0.60
STA 366+00.0
STA 389+60.0 WP: 7.0
1,361.5'
STA 379+73.0
100.0' SAN DIEGO AVE. OPEN CUT
STA 380+73.0
4,738.5'
STA 422+40.0 WP: 8.0
STA 428+00.0
EASEMENT
WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT
45'
50'
C/L PROPOSED 30" GILL RANCH PIPELINE
60' x 300' T.U.A.
PROFILE
GRADE
EDGE OF ROAD
STA 380+11.5
EDGE OF ROAD
STA 380+34.5
EDGE OF ROAD
STA 406+80.1
EDGE OF ROAD
STA 406+88.8
WWD51ST
STA 422+40.0
380 340 300 260 220 180 140 100
366+00 368+00 370+00 372+00 374+00 376+00 378+00 380+00 382+00 384+00 386+00 388+00 390+00 392+00 394+00 396+00 398+00 400+00 402+00 404+00 406+00 408+00 410+00 412+00 414+00 416+00 418+00 420+00 422+00 424+00 426+00 428+00
HORIZONTAL SCALE 1" = 200', VERTICAL SCALE 1" = 200'
SUMMARY
SUMMARY OF MATERIALS
1 30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 WLS FBE 6,100.0'
3 30" O.D. BORE PIPE x 0.607" W.T., API 5L X70, W/ 40 WLS AND OVER 14-16 WLS FBE 100.0'
CATHODIC TEST STATION 2
TOTAL 6,200.0'
ITEM DESCRIPTION QUANTITY
SUMMARY OF MATERIALS
ITEM DESCRIPTION QUANTITY
REFERENCE DRAWINGS
12361-180C-006 30" PIPELINE ALIGNMENT
12361-180C-008 30" PIPELINE ALIGNMENT
DWG. NO. TITLE
REVISIONS
P9 ISSUED FOR REVIEW RS 5/29/09 CFE 5/29/09
P8 ISSUED FOR REVIEW SL 5/06/09
P7 PRELIMINARY / NEW SCALE SL 4/20/09
P6 ISSUE FOR PERMIT MSP 7/8/08 CFE 7/8/08
P5 ISSUE FOR PERMIT PJD 5/27/08 CFE 5/27/08
P4 PRELIMINARY PJD 4/11/08 CFE 4/11/08
P3 PRELIMINARY PJD 4/1/08 CFE 4/1/08
P2 PRELIMINARY RC 2/27/08 CFE 2/27/08
REV. DESCRIPTION BY DATE CHK APPR DATE
ENGINEERING RECORD
DRAWN SL 5/06/09
CHECKED CFE 5/06/09
CLIENT
PROJECT MGMT.
PROCESS
MECHANICAL
PIPING
STRUCTURAL
ELECTRICAL
I & C
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ForeRunner Corporation
GILL RANCH STORAGE
GILL RANCH
30" PIPELINE ALIGNMENT
STA 366+00.0 TO 428+00.0
SCALE AS NOTED
PROJ. NO. 12361-C
CITY/COUNTY, STATE Fresno Co., CA
DWG. NO. 12361-180C-007
REV P9
Plotted by: R.SUMPOLD Date: 5/28/2009 3:23 PM DrawPrep: S:\Project Files\NW Network\Gill Ranch\12361-C Transmission Pl\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - PSV\12361-180C-007_200.dwg

OWNERSHIP

STA 428+00.0 — (028-150-37) WESTLANDS WATER DIST — 521.7 FEET/ 31.6 RODS (559)241-6233 — STA 435+21.7

STA 435+21.7 — (028-160-01) WARDEN, RONALD E. — 6,351.5 FEET/ 324.5 RODS — STA 486+73.2

STA 486+73.2 — (028-160-19) WESTLANDS WATER DIST — 426.8 FEET/ 28.9 RODS (559)241-6233 — STA 491+00.0

P/L DEPTH

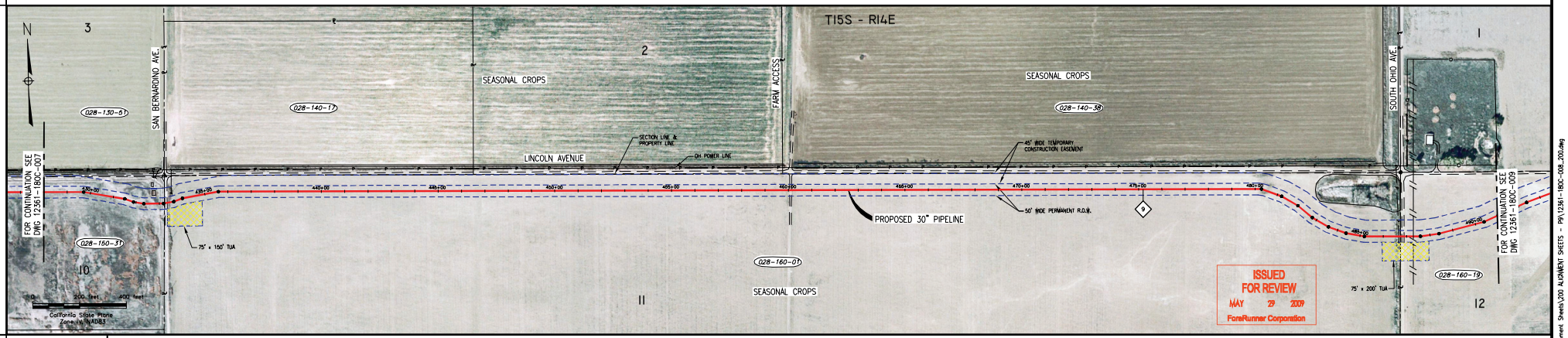
PIPELINE DEPTH 5' TO T.O.P.

ENVIRONMENTAL

STATIONING

STA 428+00.0	MATCH LINE				
STA 429+70.7	POINT OF INTERSECTION	093739" RT	189		
STA 431+49.2	POINT OF INTERSECTION	095954" RT	170		
STA 431+89.2	POINT OF INTERSECTION	095958" RT	171		
STA 432+33.6	POINT OF INTERSECTION	095958" RT	172		
STA 433+18.0	POINT OF INTERSECTION	100004" LT	173		
STA 433+21.7	SECTION LINE, PROPERTY LINE	095958" LT			
STA 433+23.5	EDGE OF ROAD		174		
STA 433+33.9	EDGE OF ROAD		175		
STA 433+42.4	POINT OF INTERSECTION	100003" LT	176		
STA 434+02.4	POINT OF INTERSECTION	100003" RT	177		
STA 435+58.7	POINT OF INTERSECTION	102353" RT	178		
STA 460+05.8	EDGE OF ROAD		179		
STA 460+13.8	EDGE OF ROAD		180		
STA 480+26.5	POINT OF INTERSECTION	200100" RT	181		
STA 481+18.9	POINT OF INTERSECTION	095959" RT	182		
STA 481+98.9	POINT OF INTERSECTION	100001" RT	183		
STA 482+78.9	POINT OF INTERSECTION	100002" LT	184		
STA 483+58.9	POINT OF INTERSECTION	095957" LT	185		
STA 484+38.9	POINT OF INTERSECTION	100004" LT	186		
STA 485+18.9	POINT OF INTERSECTION	095957" LT	187		
STA 486+65.3	OH POWER LINE		188		
STA 486+73.2	SECTION LINE, PROPERTY LINE		189		
STA 486+79.4	EDGE OF ROAD		190		
STA 486+88.8	EDGE OF ROAD		191		
STA 487+28.4	PIPELINE CROSSING (APPROX.)	075958" RT	192		
STA 487+68.9	POINT OF INTERSECTION	075958" RT	193		
STA 488+38.9	POINT OF INTERSECTION	085109" LT	194		
STA 489+38.9	POINT OF INTERSECTION	095959" LT	195		
STA 491+00.0	MATCH LINE				

ALIGNMENT



PIPELINE DATA

HEAVY WALL PIPE
FITTING
PIPELINE MARKING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS

DESIGN FACTOR 0.60

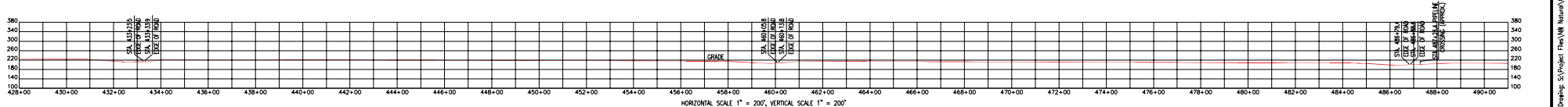
STA 428+00.0 — 6,820.0' — STA 475+20.0 WP, 9.0 — STA 486+20.0 — 100.0' SOUTH OHIO AVE. OPEN CUT — STA 487+20.0 — STA 487+28.4 PIPELINE CROSSING (APPROX.) — 380.0' — STA 491+00.0

EASEMENT

WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT

45' / 50' — C/L PROPOSED 30" GILL RANCH PIPELINE — 75' x 150' TUA — 75' x 200' TUA

PROFILE



SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE	6,200.0'
3	30" O.D. BORE PIPE x 0.607" W.T., API 5L X70, W/ 40 MILS ARO	100.0'
	CATHODIC TEST STATION	2
	TOTAL	6,300.0'

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-007	30" PIPELINE ALIGNMENT
12361-180C-009	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	APPR DATE
P9	ISSUED FOR REVIEW	RS	5/29/09	CFE	5/29/09
P8	ISSUED FOR REVIEW	SL	5/06/09		
P7	PRELIMINARY / NEW SCALE	SL	4/20/09		
P6	ISSUE FOR PERMIT	MSP	7/8/08	CFE	7/8/08
P5	ISSUE FOR PERMIT	PJD	5/27/08	CFE	5/27/08
P4	PRELIMINARY	PJD	4/11/08	CFE	4/11/08
P3	PRELIMINARY	PJD	4/1/08	CFE	4/1/08
P2	PRELIMINARY	RG	3/27/08	CFE	3/27/08

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

ForeRunner Corporation

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 428+00.0 TO 491+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Fresno Co., CA	12361-180C-008	P9

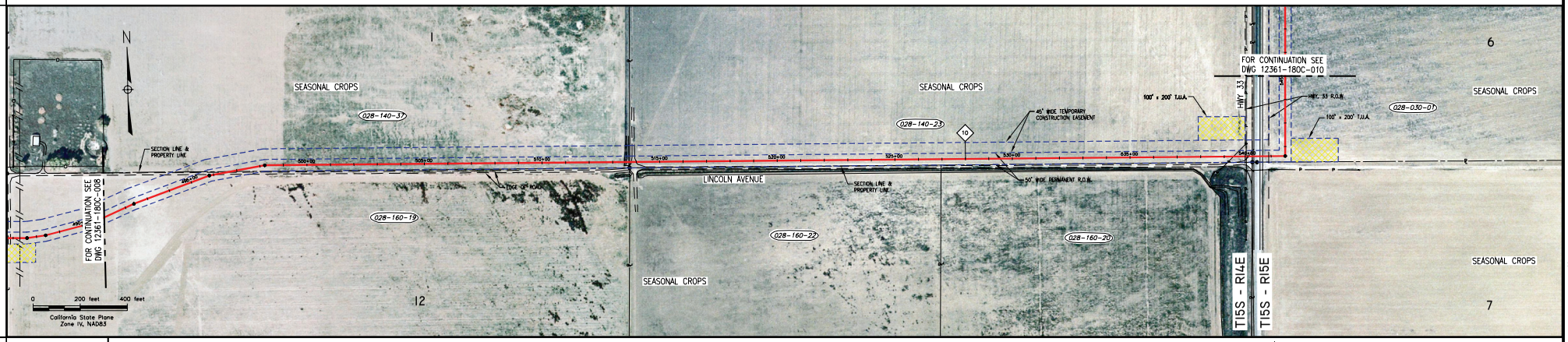
Plotted by: SLAGRA Date: 5/29/2009 3:32 PM Drawing: G:\Project Files\WIP Network\GR Ranch\12361-C Transmission Pl\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - P9\12361-180C-008_200.dwg

OWNERSHIP	STA 491+00.0	(028-160-19) WESTLANDS WATER DIST 676.8 FEET/ 39.0 RODS (559)241-6233	STA 498+76.8	(028-140-37) WESTLANDS WATER DIST 1,695.7 FEET/ 102.8 RODS (559)241-6233	STA 513+72.5
OWNERSHIP	(028-140-23) WESTLANDS WATER DIST 2,617.2 FEET/ 158.6 RODS (559)241-6233	STA 539+69.7	CDOT ST HWY 33 100.0 FEET/ 6.1 RODS	STA 540+80.7	(028-030-01) WESTLANDS WATER DIST 410.3 FEET/ 24.9 RODS (559)241-6233	STA 545+00.0
P/L DEPTH	PIPELINE DEPTH 5' TO T.O.P.					
ENVIRONMENTAL						

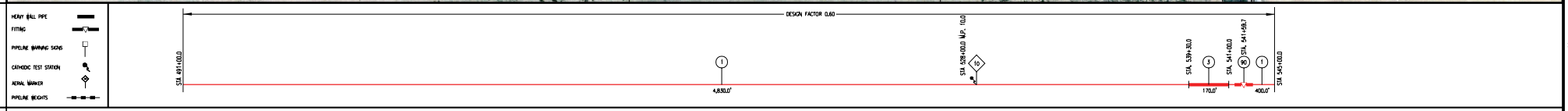
STATIONING

STA 491+00.0 MATCH LINE
STA 492+38.9 POINT OF INTERSECTION 047°22" RT
STA 496+81.3 POINT OF INTERSECTION 107°00'00" RT
STA 496+07.4 EDGE OF ROAD
STA 496+59.3 EDGE OF ROAD
STA 496+76.8 SECTION LINE, PROPERTY LINE
STA 498+20.8 POINT OF INTERSECTION 107°00'09" RT
STA 513+50.8 TOP OF SLOPE
STA 513+60.1 TOE OF SLOPE
STA 513+68.4 TOP OF SLOPE
STA 513+72.5 PROPERTY LINE
STA 513+79.6 EDGE OF ROAD
STA 514+00.7 EDGE OF ROAD
STA 539+40.0 OH POWER LINE
STA 539+89.7 RIGHT OF WAY
STA 539+94.5 OH POWER LINE
STA 540+19.7 SECTION LINE
STA 540+62.3 EDGE OF PAVEMENT
STA 540+63.5 TOE OF SLOPE
STA 540+66.1 ENTER CROPS
STA 540+89.7 RIGHT OF WAY
STA 541+09.7 POINT OF INTERSECTION 89°27'40" LT
STA 545+00.0 MATCH LINE

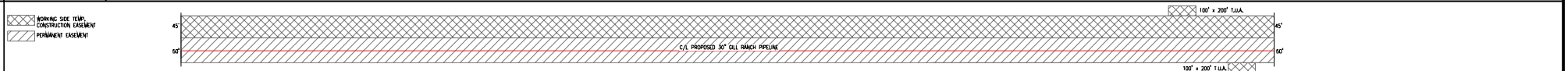
ALIGNMENT



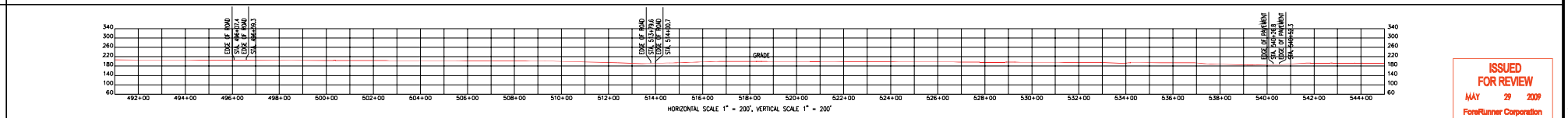
PIPELINE DATA



EASEMENT



PROFILE



ISSUED FOR REVIEW
MAY 29 2009
ForeRunner Corporation

SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 LBS FBE	5,230.0'
3	30" O.D. BORE PIPE x 0.607" W.T., API 5L X70, W/ 40 LBS ARO	
	OVER 14/16 LBS FBE	170.0'
90	90° ELBOW, 3R, (0.506" W.T.), CS, MSS SP-75, WPHY70	2
	CATHODIC TEST STATION	1
	TOTAL	5,400.0'

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-008	30" PIPELINE ALIGNMENT
12361-180C-010	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	APPR DATE
P9	ISSUED FOR REVIEW	RS	5/29/09	CFE	5/29/09
P8	ISSUED FOR REVIEW	SL	5/06/09		
P7	PRELIMINARY / NEW SCALE	SL	4/20/09		
P6	ISSUE FOR PERMIT	MSP	7/8/08	CFE	7/8/08
P5	ISSUE FOR PERMIT	PJD	5/27/08	CFE	5/27/08
P4	PRELIMINARY	PJD	4/11/08	CFE	4/11/08
P3	PRELIMINARY	PJD	4/1/08	CFE	4/1/08
P2	PRELIMINARY	RC	2/27/08	CFE	2/27/08

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

ForeRunner Corporation
[illegible] Livermore, CA 94550
925-[illegible]

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 491+00.0 TO 545+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Fresno Co., CA	12361-180C-009	P9

Plotted by: R.SCARVALO Date: 5/28/2009 3:26 PM DrawPrep: S:\Project Files\NW Naturon\Gill Ranch\12361-C Transmission Pl\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - PW\12361-180C-009_200.dwg

OWNERSHIP

STA 545+00.0

028-030-01
WESTLANDS WATER DIST
4938.3 FEET/ 299.3 RODS
(559)241-6233

STA 594+38.3

019-180-31
WESTLANDS WATER DIST
1461.7 FEET/ 88.6 RODS
(559)241-6233

STA 609+00.0

P/L DEPTH

PIPELINE DEPTH 5' TO T.O.P.

ENVIRONMENTAL

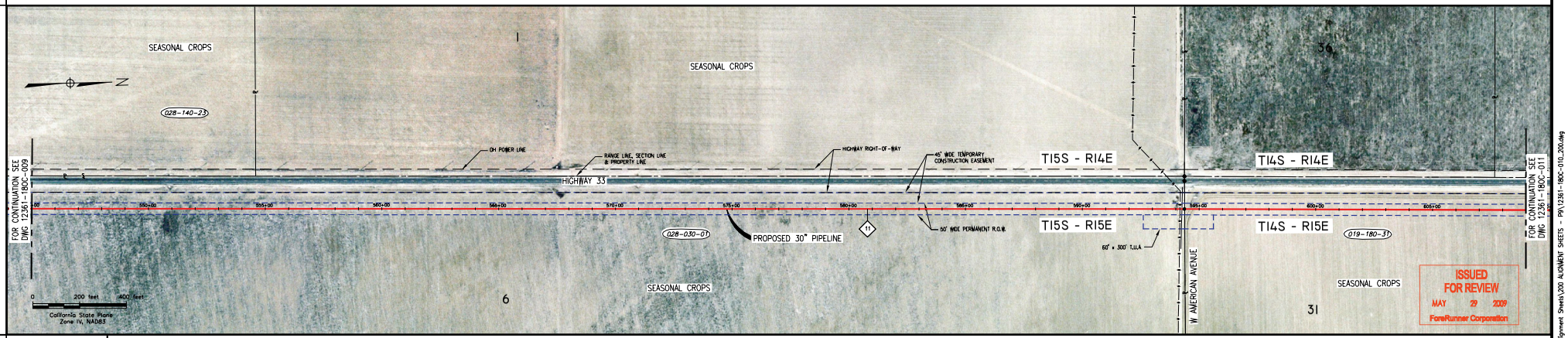
STATIONING

STA 545+00.0 MATCH LINE

STA 593+08.2 EXIT CROPS
STA 594+05.6 OH POWER LINE
STA 594+18.6 WATER LINE
STA 594+25.7 C/L OF ROAD (W. AMERICAN AVE.)
STA 594+37.2 POINT OF INTERSECTION
STA 594+38.3 TOWNSHIP, SECTION & PROPERTY LINE
STA 594+60.5 ENTER CROPS

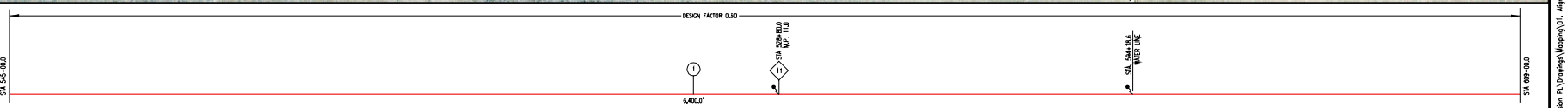
STA 609+00.0 MATCH LINE

ALIGNMENT



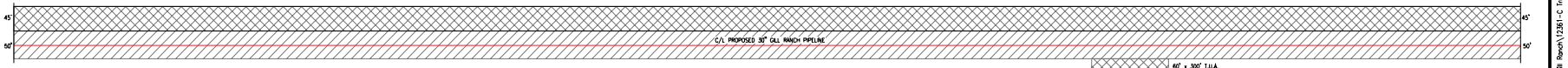
PIPELINE DATA

HEAVY WALL PIPE
FITTING
PIPELINE MARKING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS

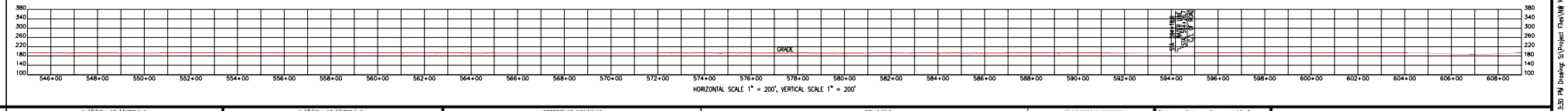


EASEMENT

WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT



PROFILE



SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 MILS FBE	6,400.0'
	CATHODIC TEST STATION	2

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-009	30" PIPELINE ALIGNMENT
12361-180C-011	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P9	ISSUED FOR REVIEW	RS	5/29/09	CFE	5/29/09		
P8	ISSUED FOR REVIEW	SL	5/06/09				
P7	PRELIMINARY / NEW SCALE	SL	4/20/09				
P6	ISSUE FOR PERMIT	MSP	1/8/08	CFE	1/8/08		
P5	ISSUE FOR PERMIT	PJD	5/27/08	CFE	5/27/08		
P4	PRELIMINARY	PJD	4/11/08	CFE	4/11/08		
P3	PRELIMINARY	PJD	4/1/08	CFE	4/1/08		
P2	PRELIMINARY	RC	2/27/08	CFE	2/27/08		

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

ForeRunner Corporation
Livermore, CA 94550
925-960-9990

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 545+00.0 TO 609+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Fresno Co., CA	12361-180C-010	P9

Plotted by: R.SCARVALO Date: 5/29/2009 3:20 PM Drawing: S:\Project Files\NW Returns\Gill Ranch\12361-C Transmission PL\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - PSV\12361-180C-010_200.dwg

OWNERSHIP

STA 609+00.0 | (019-180-31) WESTLANDS WATER DIST — 1196.3 FEET/ 72.6 RODS (559)241-6233 | STA 620+96.3 | (019-180-34) WESTLANDS WATER DIST — 2698.1 FEET/ 163.1 RODS (559)241-6233 | STA 647+54.4 | (019-180-35) WESTLANDS WATER DIST — 1110.6 FEET/ 67.3 RODS (559)241-6233 | STA 658+65.0 | (019-180-36) KRESANT OPERATING CO., INC CARL KRESANT 361.8 FEET/ 21.9 RODS (714)970-6412 | STA 662+26.8 | (019-180-35) WESTLANDS WATER DIST — 973.2 FEET/ 59.0 RODS (559)241-6233 | STA 672+00.0

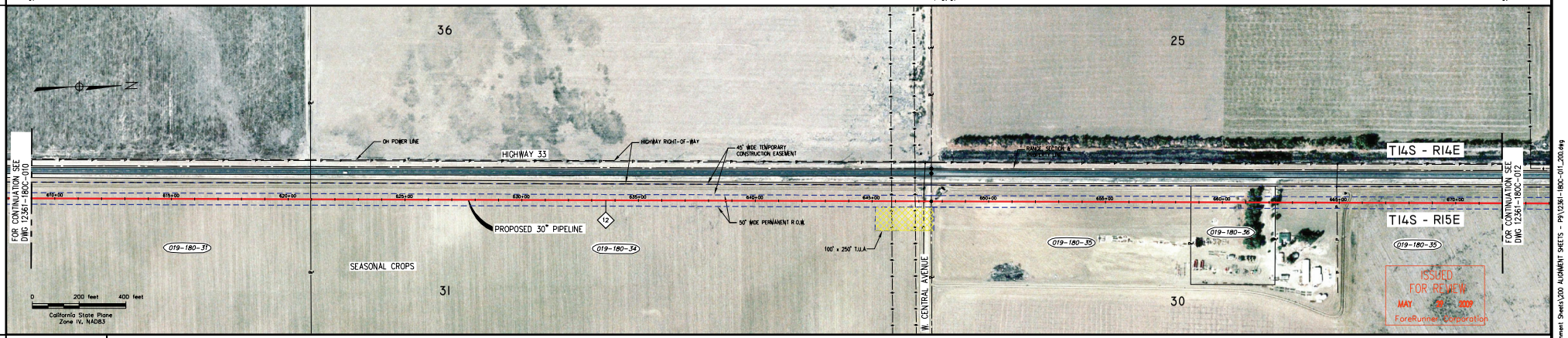
P/L DEPTH — PIPELINE DEPTH 5' TO T.O.P.

ENVIRONMENTAL

STATIONING

STA 609+00.0 MATCH LINE | 224 | STA 620+96.3 PROPERTY LINE | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | STA 645+84.1 WATER LINE | STA 646+84.9 WATER LINE | STA 647+07.1 CAT CROPS | STA 647+21.8 POWER POLE, 0.7' Lt. | STA 647+21.8 OH POWER LINE | STA 647+37.7 C/L OF ROAD (N. CENTRAL AVE.) | STA 647+53.8 POINT OF INTERSECTION | STA 647+54.4 SECTION LINE, PROPERTY LINE | STA 647+60.0 ENTER CROPS | STA 658+65.0 PROPERTY LINE (APPROX.) | 233 | STA 660+34.3 CAT CROPS | STA 662+26.8 PROPERTY LINE (APPROX.) | 234 | 235 | STA 664+90.8 OH POWER LINE | STA 665+50.6 ENTER CROPS | STA 672+00.0 MATCH LINE

ALIGNMENT



PIPELINE DATA

HEAVY WALL PIPE | FITTING | PIPELINE WARNING SIGNS | CATHODIC TEST STATION | AERIAL MARKER | PIPELINE WEIGHTS

DESIGN FACTOR 0.60

STA 609+00.0 | STA 631+60.0 W.P. 12.0 | STA 645+84.1 WATER LINE | STA 646+84.9 WATER LINE | STA 672+00.0

6,300.0'

EASEMENT

WORKING SIDE TEMP. CONSTRUCTION EASEMENT | PERMANENT EASEMENT

45' | 50' | C/L PROPOSED 30" GILL RANCH PIPELINE | 100' x 250' T.U.A.

PROFILE

380 340 300 260 220 180 140 100

GRADE

STA 645+84.1 WATER LINE | STA 646+84.9 WATER LINE | STA 647+37.7 C/L OF ROAD

610+00 612+00 614+00 616+00 618+00 620+00 622+00 624+00 626+00 628+00 630+00 632+00 634+00 636+00 638+00 640+00 642+00 644+00 646+00 648+00 650+00 652+00 654+00 656+00 658+00 660+00 662+00 664+00 666+00 668+00 670+00 672+00

HORIZONTAL SCALE 1" = 200', VERTICAL SCALE 1" = 200'

SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, B/ 14-16 WALS FBE	6,300.0'
	CATHODIC TEST STATION	3

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-010	30" PIPELINE ALIGNMENT
12361-180C-012	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P9	ISSUED FOR REVIEW	RS	5/29/09	CFE	5/29/09		
P8	ISSUED FOR REVIEW	SL	5/06/09				
P7	PRELIMINARY / NEW SCALE	SL	4/20/09				
P6	ISSUE FOR PERMIT	MSP	7/8/08	CFE	7/8/08		
P5	ISSUE FOR PERMIT	PJD	5/27/08	CFE	5/27/08		
P4	PRELIMINARY	PJD	4/11/08	CFE	4/11/08		
P3	PRELIMINARY	PJD	4/1/08	CFE	4/1/08		
P2	PRELIMINARY	RC	2/27/08	CFE	2/27/08		

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

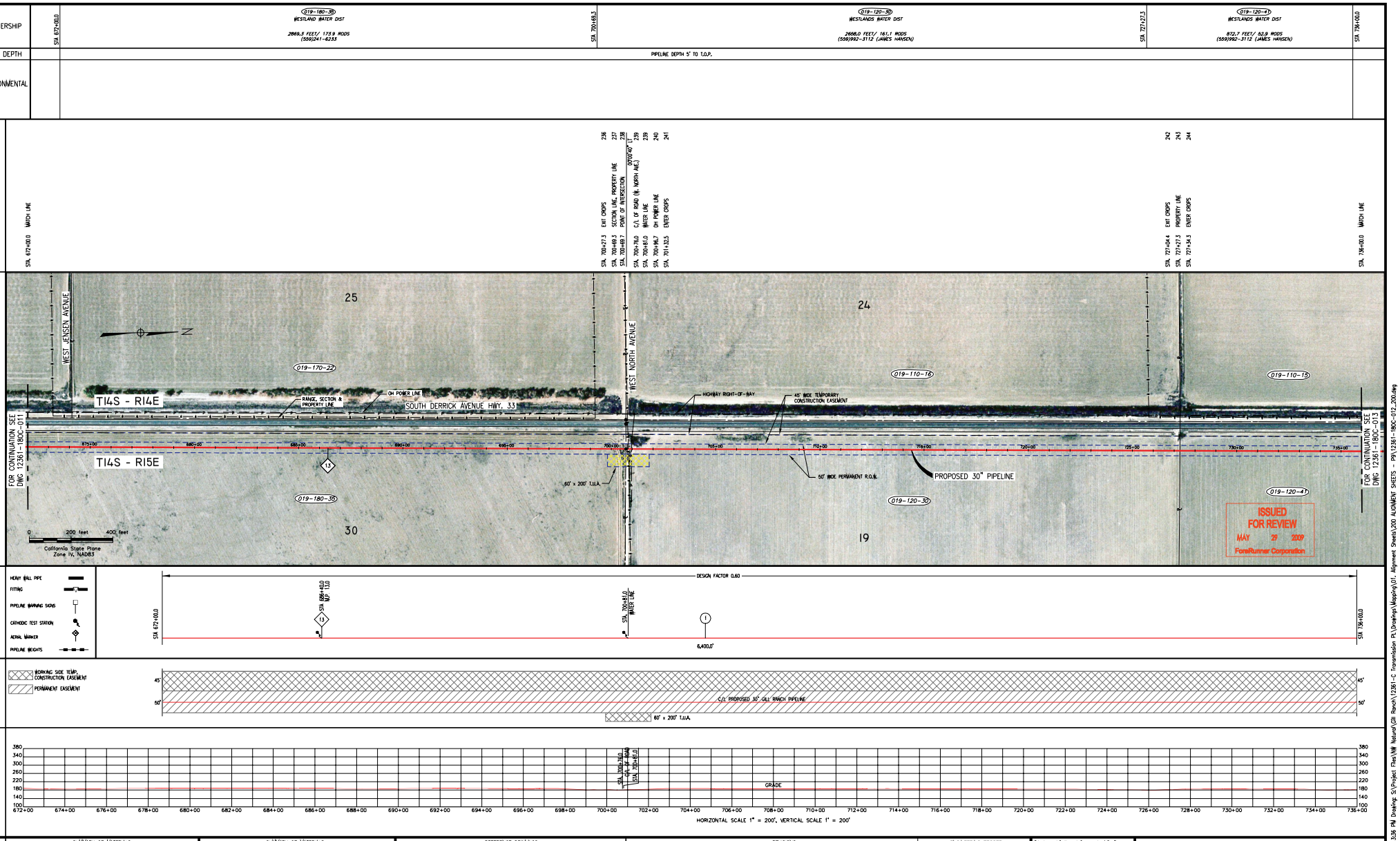
FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 609+00.0 TO 672+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG NO.	REV
AS NOTED	12361-C	Fresno Co., CA	12361-180C-011	P9

Plotted by: SLAURIA Date: 5/28/2009 8:33 AM Drawings: S:\Project Files\WIP Natural\Gill Ranch\12361-C transmission PL\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - P9\12361-180C-011_200.dwg



SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 MILS FBE	6,400.0'
	CATHODIC TEST STATION	2

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-011	30" PIPELINE ALIGNMENT
12361-180C-013	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P9	ISSUED FOR REVIEW	RS	5/29/09	CFE	5/29/09		
P8	ISSUED FOR REVIEW	SL	5/06/09				
P7	PRELIMINARY	SL	4/20/09				
P6	DRAWING NOT ISSUED						
P5	DRAWING NOT ISSUED						
P4	DRAWING NOT ISSUED						
P3	DRAWING NOT ISSUED						
P2	DRAWING NOT ISSUED						

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

ForeRunner Corporation
Livermore, CA 94550
925-960-9220

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 672+00.0 TO 736+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Fresno Co., CA	12361-180C-012	P9

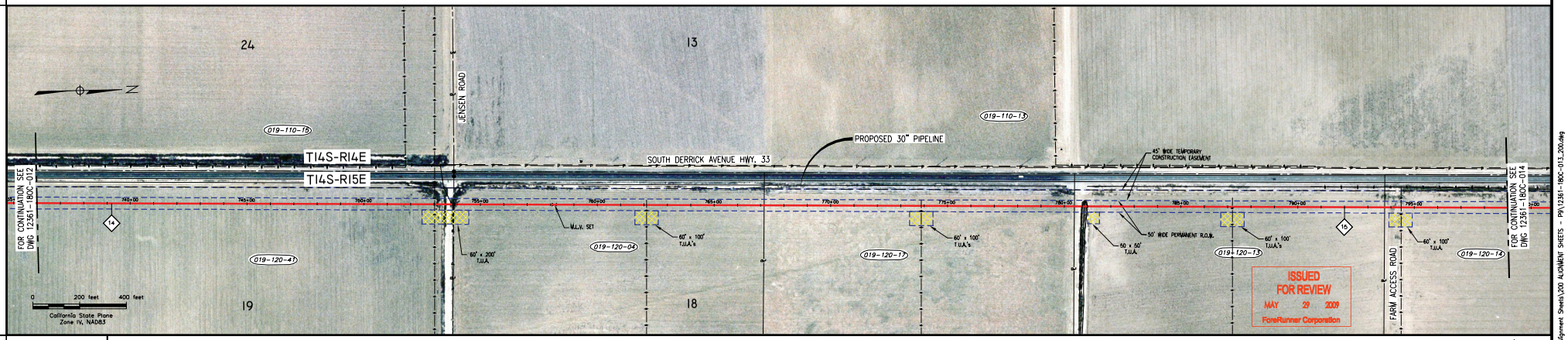
Plotted by: R.SCARBOLD Date: 5/29/2009 3:26 PM DrawPrep: S:\Project Files\NW Naturon\Gill Ranch\12361-C Transmission Pl.\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - PSV\12361-180C-012_200.dwg

OWNERSHIP	STA 736+00.0	(019-120-47) WESTLANDS WATER DIST 1,788.2 FEET/ 108.2 RODS (559)992-3112 (JAMES HANSEN)	STA 753+85.2	(019-120-04) WESTLANDS WATER DIST 1,529.2 FEET/ 80.6 RODS (559)992-3112 (JAMES HANSEN)	STA 767+14.4	(019-120-17) WESTLANDS WATER DIST 1,529.1 FEET/ 80.6 RODS (559)992-3112 (JAMES HANSEN)
OWNERSHIP	STA 780+43.5	(019-120-13) WESTLANDS WATER DIST 1,529.0 FEET/ 80.6 RODS (559)992-3112 (JAMES HANSEN)	STA 793+72.5	(019-120-14) WESTLANDS WATER DIST 527.0 FEET/ 32.0 RODS (559)992-3112 (JAMES HANSEN)	STA 799+00.0	
P/L DEPTH	PIPELINE DEPTH 5' TO T.O.P.					
ENVIRONMENTAL	SENSITIVE CULTURAL RESOURCES ARE IDENTIFIED IN THIS AREA. DETAILS ARE AVAILABLE TO QUALIFIED PERSONNEL UNDER SEPARATE COVER."					

STATIONING

245 STA 753+03.4 WATER LINE
246 STA 753+27.9 EXIT CROPS
247 STA 753+47.7 C/L OF ROAD (JENSEN ROAD)
248 STA 753+77.6 OH POWER LINE
249 STA 753+83.5 PP, 11F W. & GW ANCHOR, 11.7 LT.
250 STA 753+85.2 SECTION LINE, PROPERTY LINE
251 STA 753+85.9 POINT OF INTERSECTION 007°00'07" RT
STA 754+20.0 ENTER CROPS
252 STA 758+16.4 C/L MAIN LINE VALVE SET
253 STA 762+10.8 WATER LINE
254 STA 767+14.4 PROPERTY LINE
255 STA 773+88.3 WATER LINE
256 STA 780+43.4 EXIT CROPS
257 STA 780+43.5 PROPERTY LINE
258 STA 780+76.3 TOP OF BANK
259 STA 780+87.5 TOE OF SLOPE
260 STA 780+95.9 TOP OF BANK
261 STA 781+06.3 ENTER CROPS
262 STA 787+20.5 WATER LINE
263 STA 793+72.5 PROPERTY LINE
264 STA 794+43.0 WATER LINE
STA 799+00.0 MATCH LINE

ALIGNMENT



PIPELINE DATA

HEAVY WALL PIPE
FITTING
PIPELINE MARKING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS

STA 736+00.0
STA 739+20.0 M.P. 14.0
14
STA 753+03.4 WATER LINE
STA 758+16.4 M.L.V. SET
4
STA 762+10.8 WATER LINE
DESIGN FACTOR 0.60
1
6,300.0'
STA 773+88.3 WATER LINE
STA 787+20.5 WATER LINE
STA 792+20.0 M.P. 15.0
15
STA 794+43.0 WATER LINE
STA 799+00.0

EASEMENT

WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT

45'
50'
C/L PROPOSED 30" GILL RANCH PIPELINE
60' x 200' T.U.A.
60' x 100' T.U.A.
60' x 100' T.U.A.
50' x 50' T.U.A.
60' x 100' T.U.A.
60' x 100' T.U.A.

PROFILE

380 340 300 260 220 180 140 100

STA 739+20.0 MAIN POST 14
STA 753+03.4 WATER LINE
STA 753+47.7 C/L OF ROAD
STA 762+10.8 WATER LINE
GRADE
STA 773+88.3 WATER LINE
STA 787+20.5 WATER LINE
STA 794+43.0 WATER LINE

736+00 738+00 740+00 742+00 744+00 746+00 748+00 750+00 752+00 754+00 756+00 758+00 760+00 762+00 764+00 766+00 768+00 770+00 772+00 774+00 776+00 778+00 780+00 782+00 784+00 786+00 788+00 790+00 792+00 794+00 796+00 798+00

HORIZONTAL SCALE 1" = 200', VERTICAL SCALE 1" = 200'

SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE	6,300.0'
4	MAIN LINE VALE SET	1
	CATHODIC TEST STATION	7

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-170C-100	M.L.V. PIPING DETAILS
12361-180C-012	30" PIPELINE ALIGNMENT
12361-180C-014	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P9	ISSUED FOR REVIEW	SL	5/29/09	CFE	5/29/09		
P8	ISSUED FOR REVIEW	SL	5/06/09				
P7	PRELIMINARY	SL	4/20/09				
P6	DRAWING NOT ISSUED						
P5	DRAWING NOT ISSUED						
P4	DRAWING NOT ISSUED						
P3	DRAWING NOT ISSUED						
P2	DRAWING NOT ISSUED						

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

ForeRunner Corporation
Livermore, CA 94550

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 736+00.0 TO 799+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Fresno Co., CA	12361-180C-013	P9

Plotted by: R.SCARVALO Date: 5/29/2009 3:03 PM DrawPrep: S:\Project Files\NW Naturon\Gill Ranch\12361-C Transmission Pl.\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - PW\12361-180C-013_200.dwg

OWNERSHIP

STA 799+00.0 — (019-120-14) WESTLANDS WATER DIST — 456.8 FEET/ 27.6 RODS (559)992-3112 (JAMES HANSEN)

STA 803+56.5 — (019-120-01) WESTLANDS WATER DIST — 400.0 FEET/ 24.2 RODS (559)992-3112 (JAMES HANSEN)

STA 807+56.5 — (019-061-46) DOUBLE J FARMS — 2,729.3 FEET/ 165.4 RODS (559)992-3112 (JAMES HANSEN)

STA 834+85.8 — (019-061-40) DOUBLE J FARMS — 2,714.2 FEET/ 164.5 RODS (559)992-3112 (JAMES HANSEN)

STA 862+00.0

P/L DEPTH — PIPELINE DEPTH 5' TO T.O.P.

ENVIRONMENTAL — SENSITIVE CULTURAL RESOURCES ARE IDENTIFIED IN THIS AREA. DETAILS ARE AVAILABLE TO QUALIFIED PERSONNEL UNDER SEPARATE COVER."

STATIONING

STA 799+00.0 MATCH LINE

STA 803+56.5 PROPERTY LINE — 265

STA 805+32.2 EXIT CROPS — 266

STA 806+46.3 ENTER CROPS — 267

STA 806+52.5 POINT OF INTERSECTION — 268 — 62°02'38" RT

STA 807+56.5 SECTION LINE, PROPERTY LINE — 269

STA 807+83.1 OH POWER LINE — 270

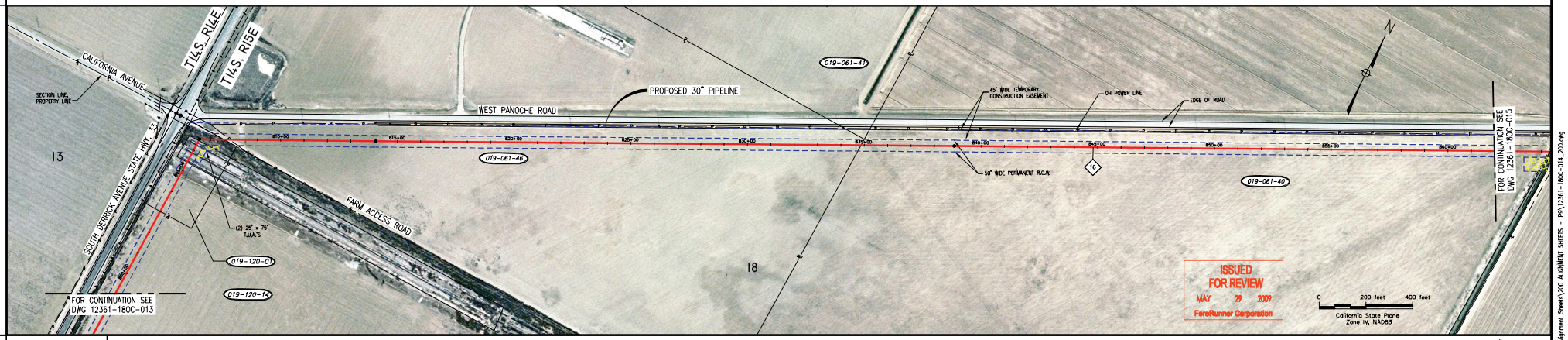
STA 814+06.9 POINT OF INTERSECTION — 271 — 007°19'51" LT

STA 834+85.8 PROPERTY LINE — 272

STA 838+85.4 POINT OF INTERSECTION — 275 — 007°03'53" RT

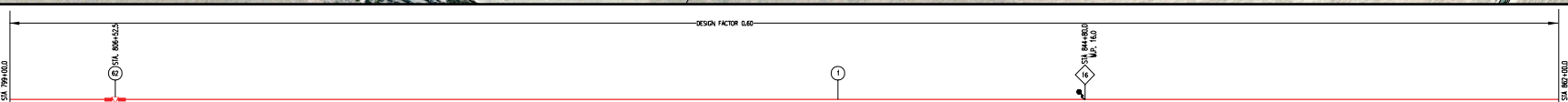
STA 862+00.0 MATCH LINE

ALIGNMENT



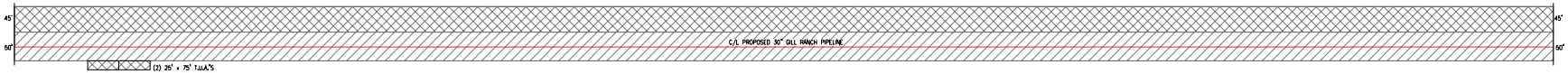
PIPELINE DATA

HEAVY WALL PIPE
FITTING
PIPELINE MARKING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS

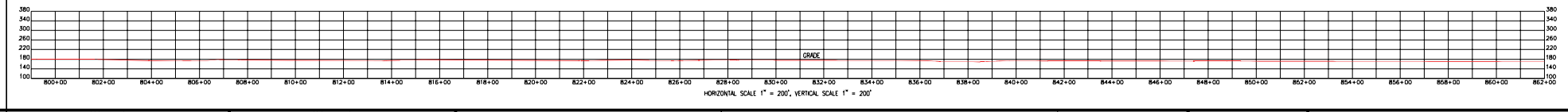


EASEMENT

WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT



PROFILE



SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 WLS FBE	6,292.1'
	CATHODIC TEST STATION	1
62	90° ELBOW, ESTIMATE(ABL, TBW TO FIT) (0.500" W.T. CS, MSS SP-75, WPHY70	1
	CS, MSS-SP-75, WPHY 70 (TRIM TO 62')	1

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-013	30" PIPELINE ALIGNMENT
12361-180C-015	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P9	ISSUED FOR REVIEW	SL	5/29/09	CFE	5/29/09		
P8	ISSUED FOR REVIEW	SL	5/06/09				
P7	PRELIMINARY	SL	4/20/09				
P6	DRAWING NOT ISSUED						
P5	DRAWING NOT ISSUED						
P4	DRAWING NOT ISSUED						
P3	DRAWING NOT ISSUED						
P2	DRAWING NOT ISSUED						

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

ForeRunner Corporation
Livermore, CA 94550

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 799+00.0 TO 862+00.0

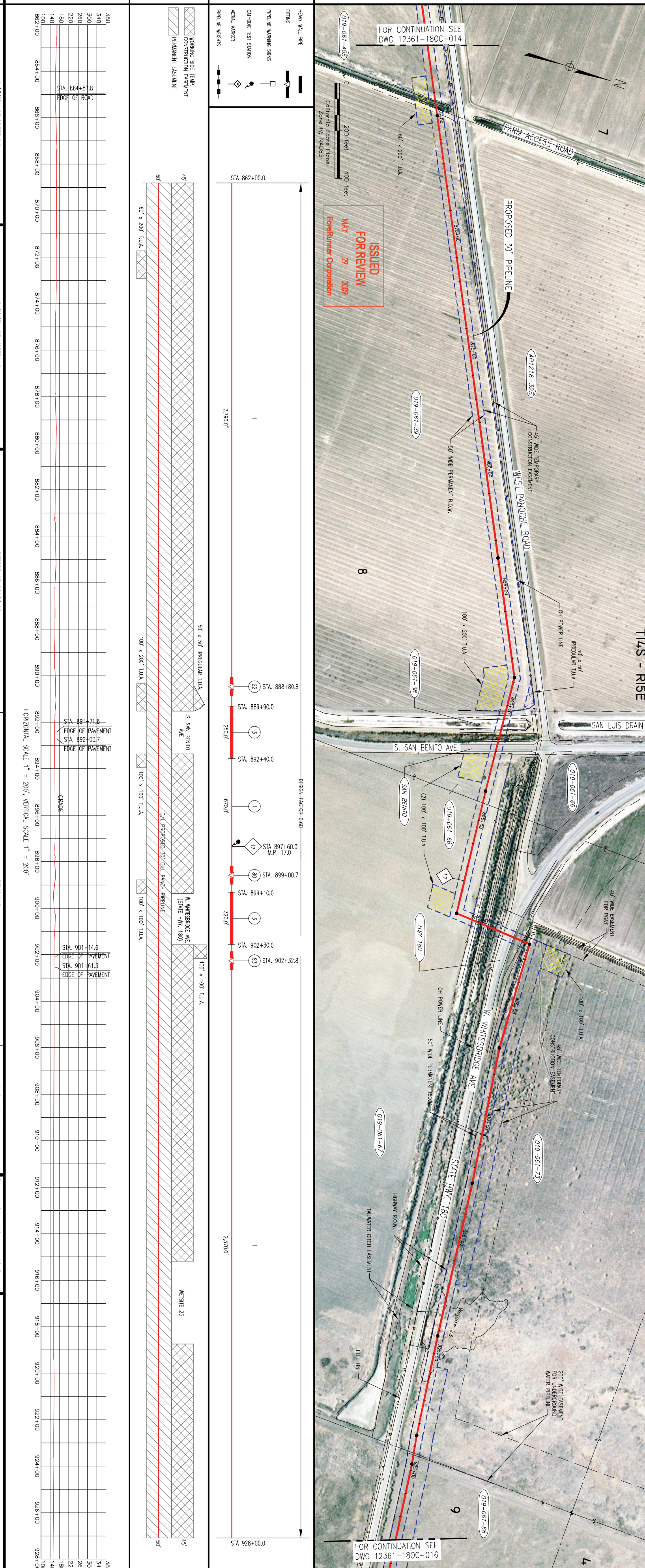
SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Fresno Co., CA	12361-180C-014	P9

Plotted by: R.SCARNULO Date: 5/29/2009 3:39 PM DrawPrep: S:\Project Files\NW Naturon\Gill Ranch\12361-C Transmission PL\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - PSV\12361-180C-014_200.dwg

GILL RANCH STORAGE

GILL RANCH 30" PIPELINE ALIGNMENT STA 862+00.0 TO 928+00.0

SUMMARY | PROFILE | EASEMENT | PIPELINE DATA | ALIGNMENT



STATIONING

STA. 862+00.0	MATCH LINE	
STA. 864+31.0	TOP OF BANK	274
STA. 864+49.1	TOE OF SLOPE	275
STA. 864+66.5	TOP OF BANK	276
STA. 864+68.3	SECTION LINE	277
STA. 864+87.8	EDGE OF ROAD	278
STA. 864+97.6	POINT OF INTERSECTION 00°02'29" LT	279
STA. 865+04.1	ENTER ORCHARD	280
STA. 890+24.6	PROPERTY LINE	
STA. 883+72.9	POINT OF INTERSECTION 00°02'07" LT	281
STA. 888+80.8	POINT OF INTERSECTION 22°10'54" RT	282
STA. 889+91.4	ENTER ORCHARD	283
STA. 890+24.6	ENTER EASEMENT	
STA. 890+27.5	TOE OF SLOPE	284
STA. 890+45.4	TOP OF SLOPE	285
STA. 890+57.4	TOP BANK OF CANAL	286
STA. 891+08.9	TOP BANK OF CANAL	287
STA. 891+21.0	TOP OF SLOPE	288
STA. 891+32.2	TOE OF SLOPE	289
STA. 891+49.8	RIGHT OF WAY, EXIT EASEMENT	
STA. 891+58.3	TOE OF SLOPE	290
STA. 891+71.8	EDGE OF PAVEMENT	291
STA. 892+00.7	EDGE OF PAVEMENT	292
STA. 892+11.5	RIGHT OF WAY	
STA. 893+73.2	POINT OF INTERSECTION 01°02'12" LT	293
STA. 894+23.1	SECTION LINE	294
STA. 899+00.7	POINT OF INTERSECTION 80°22'26" LT	295
STA. 899+71.6	FENCE	296
STA. 899+88.7	TOP OF SLOPE	297
STA. 899+98.4	TOP BANK OF CANAL	298
STA. 900+17.1	TOE OF SLOPE	299
STA. 900+26.1	TOE OF SLOPE	300
STA. 900+42.1	TOP BANK OF CANAL	301
STA. 900+52.6	TOP BANK OF CANAL	302
STA. 900+61.9	TOE OF SLOPE	303
STA. 900+66.6	TOE OF SLOPE	304
STA. 900+76.2	TOP BANK OF CANAL	305
STA. 900+79.7	RIGHT OF WAY	306
STA. 900+97.2	OH POWER LINE	307
STA. 900+99.6	TOE OF SLOPE	308
STA. 901+14.6	EDGE OF PAVEMENT	309
STA. 901+61.3	EDGE OF PAVEMENT	310
STA. 902+00.8	TOP OF SLOPE	311
STA. 902+07.7	RIGHT OF WAY	312
STA. 902+13.6	TOP OF SLOPE	313
STA. 902+13.6	FENCE	314
STA. 902+28.9	TOP OF SLOPE	315
STA. 902+32.8	POINT OF INTERSECTION 83°15'00" RT	316
STA. 906+87.0	POINT OF INTERSECTION 04°51'38" LT	317
STA. 912+66.5	POINT OF INTERSECTION 01°27'32" RT	318
STA. 917+67.2	BEGIN WETLAND	319
STA. 919+23.9	POINT OF INTERSECTION 00°49'06" LT	320
STA. 921+10.7	END WETLAND	321
STA. 923+52.0	POINT OF INTERSECTION 02°38'09" LT	323
STA. 924+27.3	SECTION LINE / PROPERTY LINE	324
STA. 924+34.1	FENCE	325
STA. 924+35.9	EXIT WATER PIPELINE EASEMENT	326
STA. 924+73.7	POINT OF INTERSECTION 02°53'18" RT	327
STA. 928+00.0	MATCH LINE	

ENVIRONMENTAL: SENSITIVE CULTURAL RESOURCES ARE IDENTIFIED IN THIS AREA. DETAILS ARE AVAILABLE TO QUALIFIED PERSONNEL UNDER SEPARATE COVER.

P/L DEPTH: PIPELINE DEPTH 5' TO T.O.P.

OWNERSHIP: STA 862+00.0 – STA 864+68.3; STA 890+24.6; STA 891+49.8; STA 892+11.5; STA 894+23.1; STA 900+79.7; STA 902+07.7; STA 924+27.3; STA 928+00.0

GILL RANCH 30" PIPELINE ALIGNMENT STA 862+00.0 TO 928+00.0

SCALE: AS NOTED | PROJ. NO. 12361-C | CITY/COUNTY, STATE: Fresno Co., CA | DWG. NO. 12361-180C-015 | REV. P9

FORERUNNER CORPORATION

Plotted by: S.LAURIA Date: 5/28/2009 3:44 PM Drawing: S:\Project Files\NW Natural\Gill Ranch\12361-C Transmission PL\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - P9\12361-180C-015_200.dwg

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 928+00.0 TO 990+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Fresno Co., CA	12361-180C-016	P9

SUMMARY

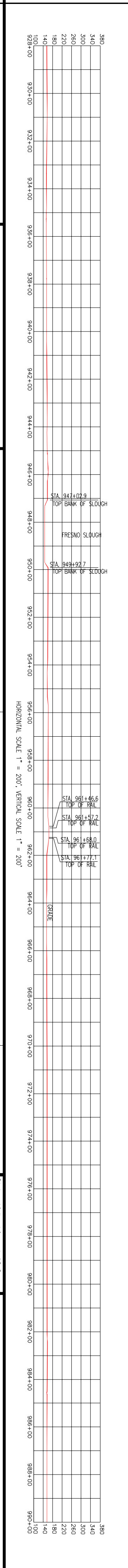
1	30" O.D. LINE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE	1,383.0'
2	30" O.D. LINE PIPE x 0.607" W.T., API 5L X70, W/ 14-16 MILS FBE	2,298.7'
3	30" O.D. BORE PIPE x 0.607" W.T., API 5L X70, W/ 40 MILS ARO OVER 14-16 MILS FBE	2,485.0'
	CATHODIC TEST STATION	1
	TOTAL	6,166.7'

12361-180C-015	30" PIPELINE ALIGNMENT
12361-180C-017	30" PIPELINE ALIGNMENT

REV	DESCRIPTION	BY	DATE
P9	ISSUED FOR REVIEW	SL	5/28/09
P8	ISSUED FOR REVIEW	SL	5/06/09
P7	PRELIMINARY	SL	4/20/09
P6	DRAWING NOT ISSUED		
P5	DRAWING NOT ISSUED		
P4	DRAWING NOT ISSUED		
P3	DRAWING NOT ISSUED		
P2	DRAWING NOT ISSUED		

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

PROFILE



EASEMENT

WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT

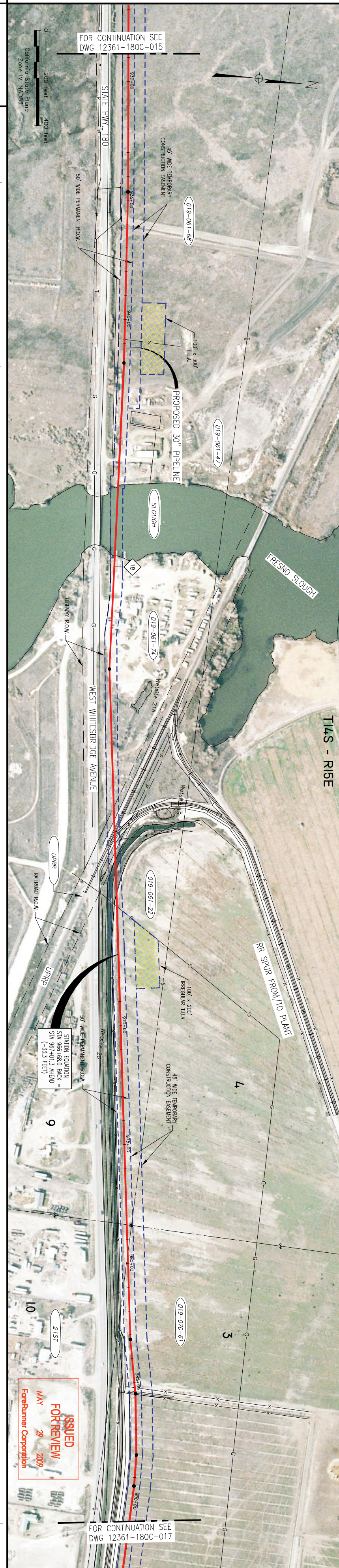
100' x 300' T.U.A.
FRESNO SLOUGH & SAN JOAQUIN R.R. HDD
C/L PROPOSED 30" GILL RANCH PIPELINE
100' x 200' IRREGULAR T.U.A.

PIPELINE DATA

HEAVY WALL PIPE
FITTING
PIPELINE MARKING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS

STA 928+00.0
DESIGN FACTOR 0.60
1,383.0'
STA 938+00.0
STA 941+83.0
STA 950+40.0 M.P. 18.0
2,485.0'
DESIGN FACTOR 0.50
STA 964+67.1 PIPELINE CROSSING
STATION EQUATION
STA 966+68.0 BACK =
STA 967+01.3 AHEAD
2,298.7'
STA 990+00.0

ALIGNMENT



STATIONING

STA. 928+00.0	MATCH LINE		
STA. 934+64.9	POINT OF INTERSECTION	328	01°15'26" RT
STA. 940+84.6	FENCE	329	
STA. 941+83.0	POINT OF INTERSECTION	331	01°20'32" RT
STA. 947+02.9	TOP BANK OF SLOUGH PROPERTY LINE (APPROX.)	953	
STA. 949+92.7	TOP BANK OF SLOUGH PROPERTY LINE (APPROX.)	954	
STA. 954+69.5	POINT OF INTERSECTION	955	04°32'22" LT
STA. 960+50.8	RAILROAD RIGHT OF WAY	956	
STA. 961+05.4	TOE OF SLOPE	957	
STA. 961+38.0	TOP OF SLOPE	958	
STA. 961+46.6	TOP OF RAIL	959	
STA. 961+57.2	TOP OF RAIL	960	
STA. 961+68.0	TOP OF RAIL	961	
STA. 961+77.1	TOP OF RAIL	962	
STA. 961+87.8	TOP OF SLOPE	963	
STA. 962+03.9	TOE OF SLOPE	964	
STA. 962+36.8	OH POWER LINE	965	
STA. 962+69.4	RAILROAD RIGHT OF WAY	966	
STA. 962+70.2	TOP OF BANK	967	
STA. 962+72.7	TOP OF SLOPE	968	
STA. 963+16.7	TOP OF BANK	969	
STA. 964+09.2	TOP OF SLOPE	970	
STA. 964+17.3	FENCE	971	
STA. 964+67.1	PIPELINE CROSSING	358	
STA. 978+37.6	SECTION LINE, PROPERTY LINE	360	
STA. 979+61.4	SECTION LINE	361	
STA. 983+19.0	POINT OF INTERSECTION	362	03°38'57" LT
STA. 985+22.1	FENCE	363	
STA. 985+38.5	TOP OF SLOPE	364	
STA. 985+45.7	TOE OF SLOPE	365	
STA. 985+48.4	POINT OF INTERSECTION	366	04°36'53" RT
STA. 985+50.5	TOP OF SLOPE, FENCE	367	
STA. 988+06.5	POINT OF INTERSECTION	368	05°12'43" RT
STA. 989+36.0	POINT OF INTERSECTION	369	03°11'37" RT
STA. 990+00.0	MATCH LINE		

STATION EQUATION
STA 966+68.0 BACK =
STA 967+01.3 AHEAD

ENVIRONMENTAL

SENSITIVE CULTURAL RESOURCES ARE IDENTIFIED IN THIS AREA. DETAILS ARE AVAILABLE TO QUALIFIED PERSONNEL UNDER SEPARATE COVER.

P/L DEPTH

PIPELINE DEPTH 5' TO T.O.P.

OWNERSHIP

STA 928+00.0	019-061-68 APPLEWHITE, LOIS ARLENE (559)229-1323	1,284.6 FEET/ 77.9 RODS
STA 940+84.6	019-061-47 APPLEWHITE, LOIS ARLENE (559)229-1323	618.3 FEET/ 37.5 RODS
STA 947+02.9	SLOUGH FRESNO SLOUGH STATE OF CALIFORNIA	289.8 FEET/ 17.6 RODS
STA 949+92.7	019-061-74 ALI, ADEL, MOHAMMED (209)722-6064	1058.1 FEET/ 64.1 RODS
STA 960+50.8	UPRR U.P.R.R.	218.6 FEET/ 13.2 RODS
STA 962+69.4	019-061-22 MEYERS, MARVIN & PAT (559)431-7726	1,534.9 FEET/ 93.0 RODS
STA 978+37.6	019-070-61 SPRECKELS SUGAR (HOLLY SUGAR CO. INC) (559)655-4961, EXT.275	1162.4 FEET/ 70.4 RODS
STA 990+00.0		

OWNERSHIP

STA 990+00.0

(019-070-61)
SPRECKEL SUGAR
(HOLLY SUGAR CO. INC
4,748.8 FEET/ 287.8 RODS
(559)655-4961, EXT.273

STA 1037+00.0

P/L DEPTH

PIPELINE DEPTH 5' TO T.O.P.

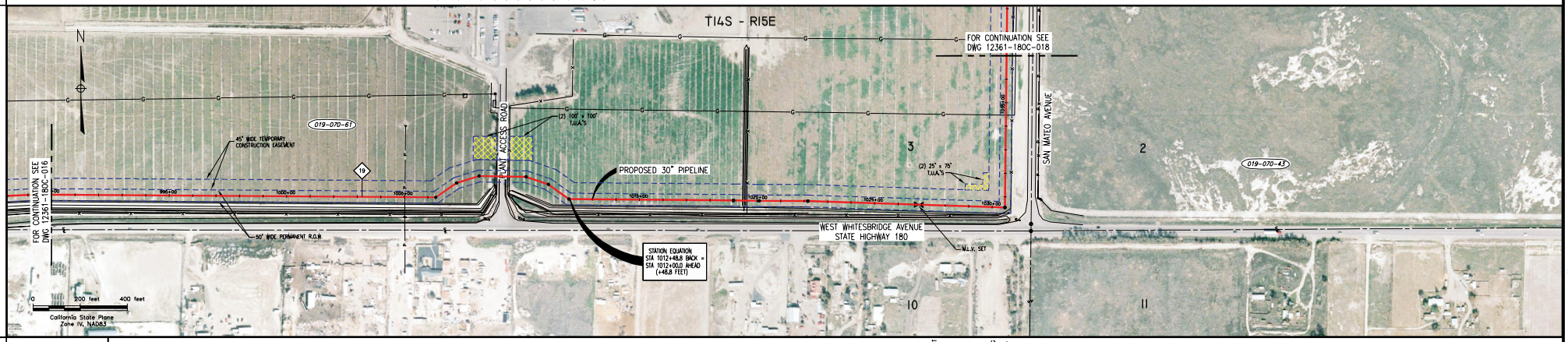
ENVIRONMENTAL

SENSITIVE CULTURAL RESOURCES ARE IDENTIFIED IN THIS AREA.
DETAILS ARE AVAILABLE TO QUALIFIED PERSONNEL UNDER SEPARATE COVER."

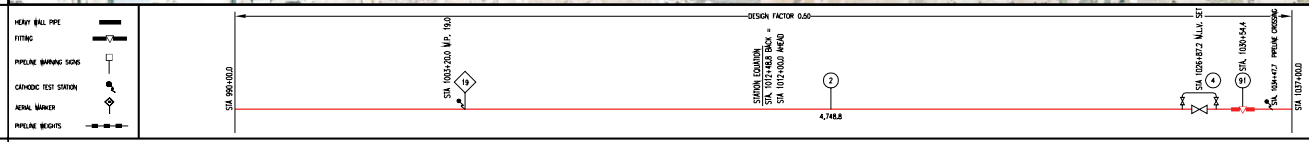
STATIONING

STA. 990+00.0 MATCH LINE
STA. 1005+02.4 370 ON POWER LINE
STA. 1006+13.9 913 POINT OF INTERSECTION 35°56'42" RT
STA. 1007+41.5 974 POINT OF INTERSECTION 17°30'00" RT
STA. 1008+41.5 975 POINT OF INTERSECTION 179°03" RT
STA. 1009+16.1 976 C/L OF FENCE
STA. 1009+27.3 978 TOP OF SLOPE
STA. 1009+27.9 979 EDGE OF PAVEMENT
STA. 1009+52.2 980 EDGE OF PAVEMENT
STA. 1009+54.1 982 TOP OF SLOPE
STA. 1009+69.8 983 C/L OF FENCE
STA. 1010+41.5 984 POINT OF INTERSECTION 179°04" RT
STA. 1011+41.5 985 POINT OF INTERSECTION 16°49'09" RT
STA. 1012+48.8 986 BACK = POINT OF INTERSECTION 35°09'36" LT
STATION EQUATION
STA. 1012+00.0 AHEAD
STA. 1018+99.2 393 POINT OF INTERSECTION 00°25'11" RT
STA. 1019+37.8 394 TOP OF SLOPE
STA. 1019+42.3 395 TOE OF SLOPE
STA. 1019+47.2 396 TOE OF SLOPE
STA. 1019+51.7 397 TOP OF SLOPE
STA. 1019+56.8 398 FENCE
STA. 1020+09.2 399 POINT OF INTERSECTION 09°41'05" LT
STA. 1022+15.6 400 POINT OF INTERSECTION 01°40'20" RT
STA. 1026+87.2 401 M.L.V. SET
STA. 1030+54.4 402 POINT OF INTERSECTION 91°14'19" LT
STA. 1034+47.7 403 PIPELINE
STA. 1037+00.0 MATCH LINE

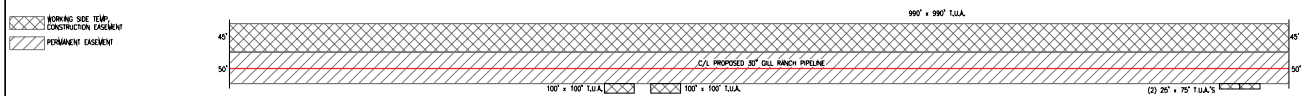
ALIGNMENT



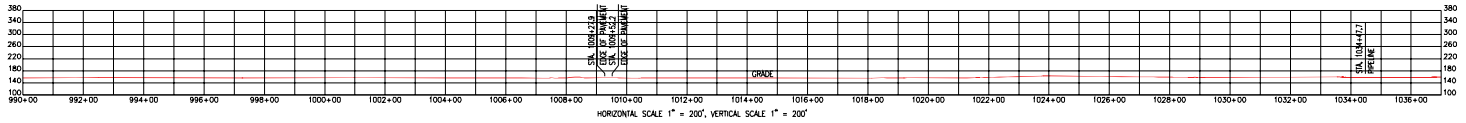
PIPELINE DATA



EASEMENT



PROFILE



ISSUED FOR REVIEW
MAY 29 2009
ForeRunner Corporation

SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 MILS FBE	0.0'
2	30" O.D. LINE PIPE x 0.607" W.T., API 5L X70, W/ 14-16 MILS FBE	4,748.8'
91	90° ELBOW, SR (0.500" W.T.), CS, MSS SP-75, WPHY70	1
4	MAIN LINE VALVE SET	1
	CATHODIC TEST STATIONS	2
	TOTAL	4,748.8

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-016	30" PIPELINE ALIGNMENT
12361-180C-018	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P9	ISSUED FOR REVIEW	SL	5/29/09	CFE	5/29/09		
P8	ISSUED FOR REVIEW	SL	5/06/09				
P7	PRELIMINARY	SL	4/20/09				
P6	DRAWING NOT ISSUED						
P5	DRAWING NOT ISSUED						
P4	DRAWING NOT ISSUED						
P3	DRAWING NOT ISSUED						
P2	DRAWING NOT ISSUED						

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

ForeRunner Corporation

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 990+00.0 TO 1037+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Fresno Co., CA	12361-180C-017	P9

Plotted by: SLAGARA Date: 5/29/2009 4:04 PM Drawing: S:\Project Files\WIP Network\Gill Ranch\12361-C Transmission P&P\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - P9\12361-180C-017_200.dwg

OWNERSHIP

STA 1037+00.0

019-070-61
SPRECKEL SUGAR
(HOLLY SUGAR CO. INC.)
4662.9 YEET/ 283.6 RODS
(505)555-7588 (JANE DOE)

STA 1081+62.9

013-030-17
SPRECKEL SUGAR
(HOLLY SUGAR CO. INC.)
1637.1YEET/ 99.2 RODS
(505)555-7588 (JANE DOE)

STA 1100+00.0

P/L DEPTH

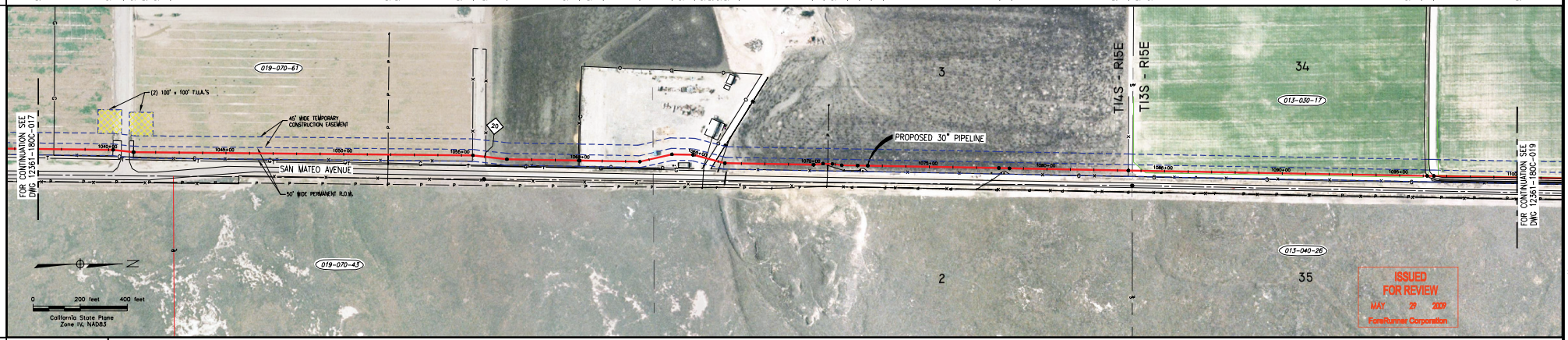
PIPELINE DEPTH 5' TO T.O.P.

ENVIRONMENTAL

STATIONING

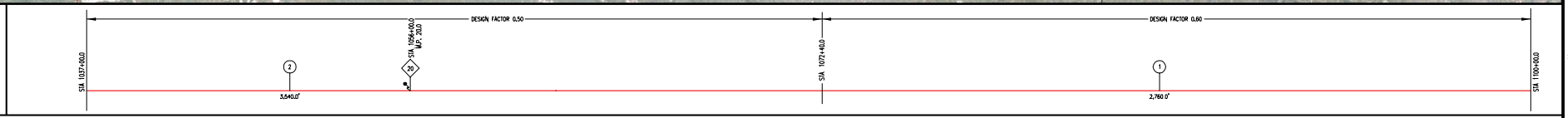
STA 1037+00.0 MATCH LINE
405
STA 1040+17.9 FENCE
406
STA 1040+19.1 POINT OF INTERSECTION 06°01'59" RT.
407
STA 1040+53.8 EDGE OF PAVEMENT
408
STA 1040+88.4 EDGE OF PAVEMENT
409
STA 1041+06.1 FENCE
410
STA 1041+07.1 POINT OF INTERSECTION 06°08'13" LT.
411
STA 1051+88.7 OH POWER LINE
412
STA 1051+88.7 POWER POLE, 6.4' RT.
413
STA 1055+47.7 FENCE
414
STA 1055+49.2 POINT OF INTERSECTION 06°03'05" RT.
418
STA 1056+04.0 FENCE
419
STA 1056+94.0 POINT OF INTERSECTION 05°35'18" LT.
420
STA 1059+98.6 FENCE
421
STA 1059+99.7 POINT OF INTERSECTION 06°04'37" RT.
422
STA 1060+43.9 FENCE
423
STA 1060+94.4 POINT OF INTERSECTION 05°57'48" LT.
424
STA 1062+59.9 POINT OF INTERSECTION 13°56'54" LT.
415
STA 1065+99.9 POINT OF INTERSECTION 14°00'15" RT.
416
STA 1064+28.5 BUILDING CORNER, 35.0' RT.
417
STA 1064+88.5 POINT OF INTERSECTION 15°40'16" RT.
425
STA 1066+29.5 POINT OF INTERSECTION 15°49'40" LT.
409
STA 1070+02.2 POINT OF INTERSECTION 07°10'54" LT.
426
STA 1070+47.2 POINT OF INTERSECTION 07°10'58" RT.
427
STA 1070+87.2 POINT OF INTERSECTION 07°10'42" RT.
430
STA 1071+27.2 POINT OF INTERSECTION 07°10'45" LT.
431
STA 1071+94.7 POINT OF INTERSECTION 07°10'45" LT.
432
STA 1072+57.9 POINT OF INTERSECTION 00°26'50" RT.
433
STA 1077+85.4 POINT OF INTERSECTION 00°17'37" RT.
434
STA 1078+40.5 POINT OF INTERSECTION 00°16'24" LT.
435
STA 1083+45.8 FENCE
436
STA 1083+46.1 POINT OF INTERSECTION 00°01'58" LT.
437
STA 1083+62.9 SECTION LINE / PROPERTY LINE
438
STA 1084+09.4 ENTER DROPS
439
STA 1096+09.6 EXIT DROPS
440
STA 1096+15.6 POINT OF INTERSECTION 00°07'16" RT.
441
STA 1096+45.3 POINT OF INTERSECTION 00°06'48" LT.
STA 1100+00.0 MATCH LINE

ALIGNMENT



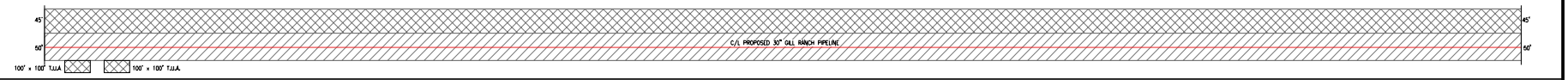
PIPELINE DATA

HEAVY WALL PIPE
FITTING
PIPELINE MARKING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS

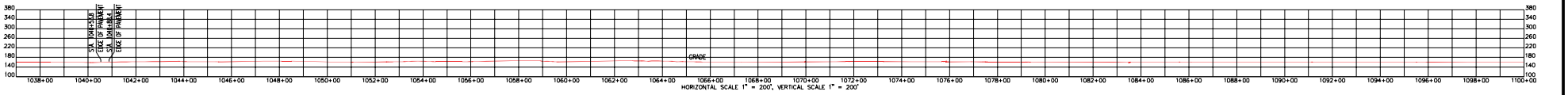


EASEMENT

WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT



PROFILE



SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 WLS FBE	2,760.0'
2	30" O.D. LINE PIPE x 0.607" W.T., API 5L X70, W/ 14-16 WLS FBE	3,540.0'
	CATHODIC TEST STATION	1
	TOTAL	6,300.0'

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-017	30" PIPELINE ALIGNMENT
12361-180C-019	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P9	ISSUED FOR REVIEW	RS	5/29/09				
P8	ISSUED FOR REVIEW	SL	5/06/09				
P7	PRELIMINARY	SL	4/20/09				
P6	DRAWING NOT ISSUED						
P5	DRAWING NOT ISSUED						
P4	DRAWING NOT ISSUED						
P3	DRAWING NOT ISSUED						
P2	DRAWING NOT ISSUED						

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

ForeRunner Corporation
Livermore, CA 94550

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 1037+00.0 TO 1100+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Fresno Co., CA	12361-180C-018	P9

Plotted by: SLAGRA Date: 5/29/2009 4:06 PM Drawing: S:\Project Files\NW Natural\Gill Ranch\12361-C Transmission P/L\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - P9\12361-180C-018_200.dwg

OWNERSHIP

STA 1100+00.0

013-030-17 SPRECKEL SUGAR (HOLY SUGAR CO, INC) 990.4 FEET/ 60.0 RODS (505)555-7588 (JANE DOE)

STA 1109+90.4

013-030-33 BOREL BANK & TRUST 2637.6 FEET/ 159.8 RODS

STA 1158+28.0

013-030-38 ADOLPH, MICHAEL 350.0 FEET/ 21.2 RODS

STA 1161+78.0

013-030-36 ADOLPH, MICHAEL 350.0 FEET/ 21.2 RODS

STA 1144+28.0

013-030-43 ADOLPH, MICHAEL 350.0 FEET/ 21.2 RODS

STA 1146+78.0

013-030-44 ADOLPH, MICHAEL 350.0 FEET/ 21.2 RODS

STA 1150+28.0

013-030-45 ADOLPH, MICHAEL 946.0 FEET/ 57.3 RODS

STA 1159+74.0

013-030-39 ADOLPH, MICHAEL 526.0 FEET/ 19.7 RODS

STA 1163+00.0

P/L DEPTH

PIPELINE DEPTH 5' TO T.O.P.

ENVIRONMENTAL

STATIONING

STA 1100+00.0 MATCH LINE

STA 1108+68.3 WELL HEAD, 11.2' LT. 442

STA 1108+94.6 POINT OF INTERSECTION 02°13'53" LT 443

STA 1109+85.5 OH POWER LINE 444

STA 1109+89.5 POWER POLE, 19.5' LT. 445

STA 1109+89.7 OH POWER LINE 446

STA 1109+90.2 GUY WIRE ANCHOR, 8.4' RT. 447

STA 1109+90.4 FENCE / PROPERTY LINE 448

STA 1109+95.3 POINT OF INTERSECTION 02°13'46" RT 449

STA 1110+39.3 ENTER CROPS 450

STA 1122+63.0 EXIT CROPS 451

STA 1123+02.8 EDGE OF ROAD 452

STA 1123+14.7 EDGE OF ROAD 453

STA 1123+28.5 STAND PIPE, 7.1' RT. 454

STA 1123+36.9 GATE VALVE, 9.4' RT. 455

STA 1123+46.2 ENTER CROPS 456

STA 1134+69.8 POINT OF INTERSECTION 07°12'10" LT 457

STA 1135+48.8 POINT OF INTERSECTION 07°09'27" RT 458

STA 1135+52.2 EXIT CROPS 459

STA 1135+67.5 WELL HEAD, 13.5' RT. 460

STA 1135+80.8 POWER POLE, 10.5' RT. 461

STA 1136+00.1 OH POWER LINE 462

STA 1136+00.1 POWER POLE, 9.9' RT. 463

STA 1136+11.2 EDGE OF ROAD 464

STA 1136+22.0 EDGE OF ROAD 465

STA 1136+28.0 SECTION LINE / PROPERTY LINE 466

STA 1136+29.8 POINT OF INTERSECTION 07°06'49" RT 467

STA 1136+34.7 ENTER CROPS 468

STA 1137+09.8 POINT OF INTERSECTION 07°14'43" LT 469

STA 1139+78.0 PROPERTY LINE

STA 1145+28.0 PROPERTY LINE

STA 1146+78.0 PROPERTY LINE

STA 1150+28.0 PROPERTY LINE

STA 1155+59.8 EXIT CROPS 470

STA 1156+76.5 HANG. 0.6' RT. (TO BE REMOVED) 471

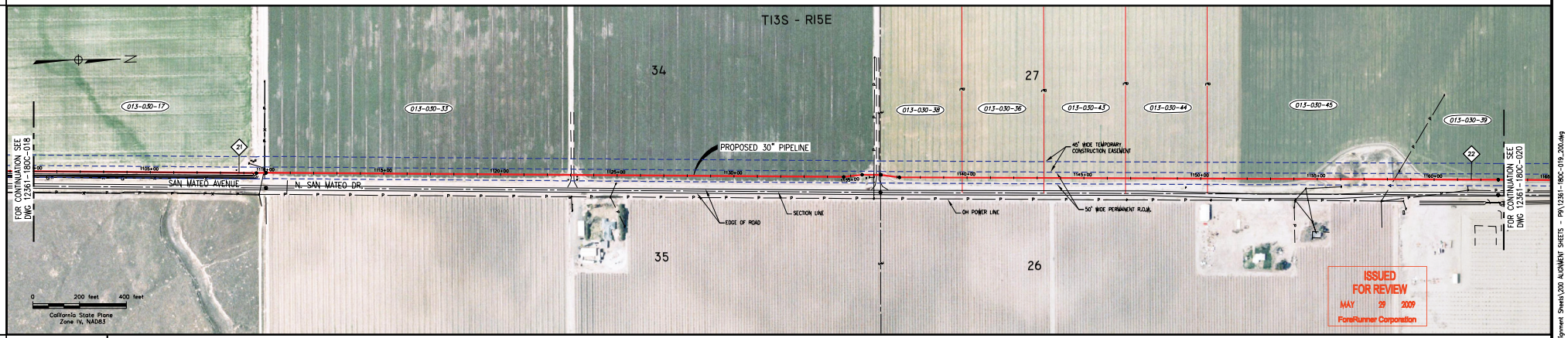
STA 1158+30.0 OH POWER LINE 472

STA 1159+30.3 ENTER CROPS 473

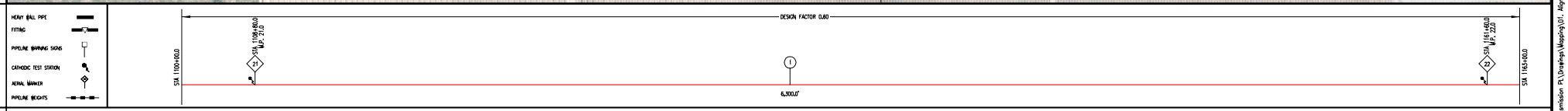
STA 1162+74.9 POINT OF INTERSECTION 00°01'02" RT 474

STA 1165+00.0 MATCH LINE

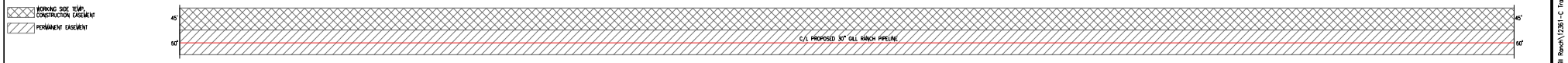
ALIGNMENT



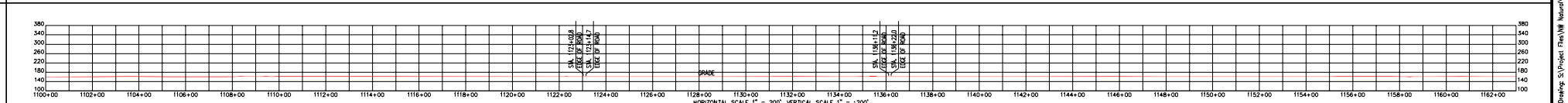
PIPELINE DATA



EASEMENT



PROFILE



SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 WLS FBE	6,300.0'
	CATHODIC TEST STATION	2
	TOTAL	6,300.0'

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-018	30" PIPELINE ALIGNMENT
12361-180C-020	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P9	ISSUED FOR REVIEW	RS	5/29/09	CFE	5/29/09		
P8	ISSUED FOR REVIEW	SL	5/06/09				
P7	PRELIMINARY	SL	4/20/09				
P6	DRAWING NOT ISSUED						
P5	DRAWING NOT ISSUED						
P4	DRAWING NOT ISSUED						
P3	DRAWING NOT ISSUED						
P2	DRAWING NOT ISSUED						

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

FORERUNNER CORPORATION

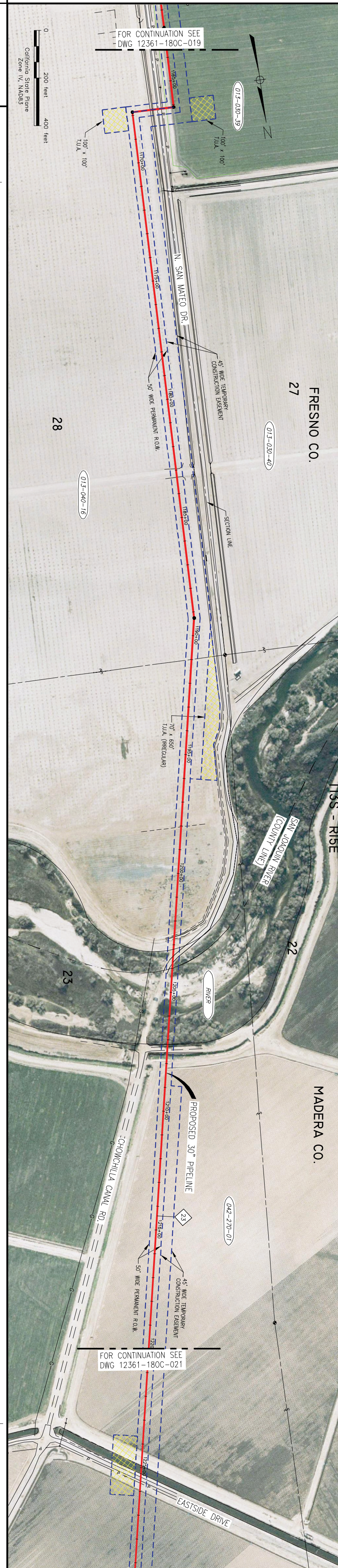
GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 1100+00.0 TO 1163+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Fresno Co., CA	12361-180C-019	P9

Plotted by: R.SCARVALO Date: 5/29/2009 3:48 PM DrawPrep: S:\Project Files\NW Network\Gill Ranch\12361-C Transmission Pl.\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - PSV\12361-180C-019_200.dwg

SUMMARY	PROFILE	EASEMENT	PIPELINE DATA	ALIGNMENT	STATIONING	ENVIRONMENTAL	P/L DEPTH	OWNERSHIP



STATIONING

Station	Description	No.
STA. 1163+00.0	MATCH LINE	
STA. 1166+10.8	POINT OF INTERSECTION 89°59'58" RT	475
STA. 1166+42.7	EXIT CROPS	476
STA. 1166+57.5	OH POWER LINE	477
STA. 1166+63.6	EDGE OF ROAD	478
STA. 1166+75.8	SECTION LINE / PROPERTY LINE	479
STA. 1166+80.8	EDGE OF ROAD	480
STA. 1166+97.9	TOP OF SLOPE	481
STA. 1167+02.4	TOE OF SLOPE	482
STA. 1167+10.3	TOP OF SLOPE	483
STA. 1167+54.4	ENTER CROPS	484
STA. 1167+85.8	POINT OF INTERSECTION 89°59'58" LT	485
STA. 1182+75.9	EXIT CROPS	486
STA. 1182+94.0	EDGE OF ROAD	487
STA. 1183+29.8	EDGE OF ROAD	488
STA. 1183+45.5	ENTER CROPS	489
STA. 1189+25.3	POINT OF INTERSECTION 10°31'34" RT	490
STA. 1190+99.8	SECTION LINE	491
STA. 1198+04.1	WATER LINE	492
STA. 1202+12.8	EXIT CROPS	493
STA. 1202+60.7	TOP BANK OF CANAL	494
STA. 1202+66.7	C/L CANAL	495
STA. 1202+75.1	TOP BANK OF CANAL	496
STA. 1203+19.0	TOP BANK OF RIVER	
STA. 1203+47.9	EDGE OF PAVEMENT	
STA. 1203+76.1	EDGE OF PAVEMENT	
STA. 1205+19.3	C/L SAN JOAQUIN RIVER	
STA. 1207+19.5	EDGE OF ROAD & TOP BANK OF RIVER	497
STA. 1207+43.6	EDGE OF ROAD	498
STA. 1207+53.5	TOP OF SLOPE	499
STA. 1207+59.1	TOE OF SLOPE	500
STA. 1207+95.5	ENTER CROPS	501
STA. 1208+95.3	BLOW OFF VALVE, 25' RT.	502
STA. 1212+05.4	EXIT CROPS	503
STA. 1212+50.4	ENTER CROPS	504
STA. 1220+00.0	MATCH LINE	

PIPELINE DEPTH 5' TO T.O.P.

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 MILS FBE	3,940.0'
3	30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 MILS FBE OVER 14-16 MILS FBE	1,600.0'
5	30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 MILS FBE	160.0'
90	90° ELBOW, 5R (0.500" W.T.), CS, MSS SP-75, WPHY70	2
	CATHODIC TEST STATION	1
	TOTAL	5,700.0'

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-019	30" PIPELINE ALIGNMENT
12361-180C-021	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P9	ISSUED FOR REVIEW	RS	5/29/09	CFE	5/29/09		
P8	ISSUED FOR REVIEW	SL	5/06/09				
P7	PRELIMINARY	SL	4/20/09				
P6	DRAWING NOT ISSUED						
P5	DRAWING NOT ISSUED						
P4	DRAWING NOT ISSUED						
P3	DRAWING NOT ISSUED						
P2	DRAWING NOT ISSUED						

HORIZONTAL SCALE 1" = 200', VERTICAL SCALE 1" = 200'

ISSUED FOR REVIEW MAY 29 2009 ForeRunner Corporation

GILL RANCH STORAGE

GILL RANCH 30" PIPELINE ALIGNMENT STA 1163+00.0 TO 1220+00.0

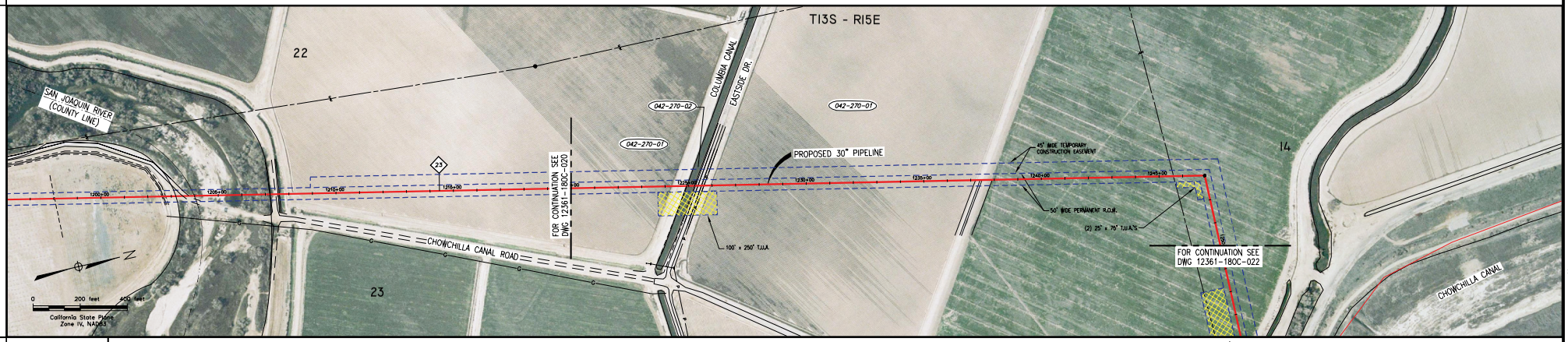
SCALE: AS NOTED | PROJ. NO. 12361-C | CITY/COUNTY, STATE: Fresno/Madera Co., CA | DWG. NO. 12361-180C-020 | REV. P9

OWNERSHIP	STA 1220+00.0	042-270-01 PARAMOUNT ORCHARDS PARTNERS VAI, LLC 491.1 FEET/ 29.7 RODS	STA 1224+91.1 04-270-02 COLUMBIA CANAL COMPANY 38.4FEET/2.3 RODS STA 1225+29.5 042-270-01 PARAMOUNT ORCHARDS PARTNERS VAI, LLC 2470.8 FEET/149.7 RODS	STA 1250+00.0
P/L DEPTH		PIPELINE DEPTH 5' TO T.O.P.		
ENVIRONMENTAL		SENSITIVE CULTURAL RESOURCES ARE IDENTIFIED IN THIS AREA. DETAILS ARE AVAILABLE TO QUALIFIED PERSONNEL UNDER SEPARATE COVER."		

STATIONING

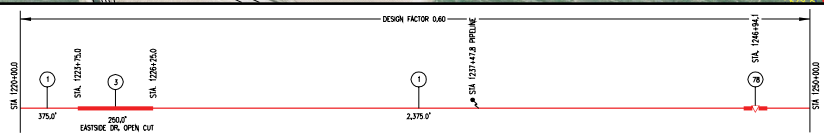
STA 1220+00.0 MATCH LINE
STA 1224+30.1 EXIT CROPS
STA 1224+91.1 TOP BANK OF CANAL
STA 1225+29.5 TOP BANK OF CANAL
STA 1225+38.4 EDGE OF PAVEMENT
STA 1225+47.0 C/L OF EASTSIDE DR. (APPROX.)
STA 1225+54.5 EDGE OF PAVEMENT
STA 1225+65.3 OH POWER LINE
STA 1225+98.8 ENTER CROPS
STA 1237+19.6 EXIT CROPS
STA 1237+39.5 C/L OF FIELD ROAD
STA 1237+47.8 PIPELINE
STA 1237+97.0 ENTER CROPS
STA 1246+61.5 SECTION LINE
STA 1246+94.1 POINT OF INTERSECTION 85°37'39" RT
STA 1250+00.0 MATCH LINE

ALIGNMENT



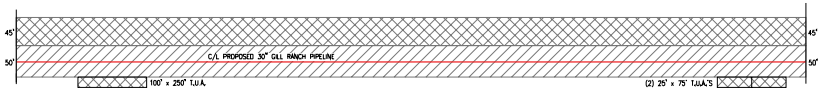
PIPELINE DATA

HEAVY WALL PIPE
FITTING
PIPELINE MARKING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS

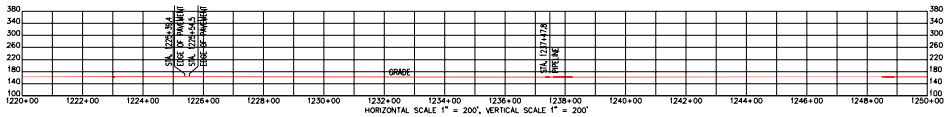


EASEMENT

WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT



PROFILE



ISSUED FOR REVIEW
MAY 29 2009
ForeRunner Corporation

SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, W/ 14-16 MILS FBE	2,750.0'
	CATHODIC TEST STATION	1
3	30" O.D. BORE PIPE x 0.812" W.T., API 5L X70, W/ 40 MILS ARO OVER 14/16 MILS FBE	250.0'
78	90° ELBOW, (SECONDARY, TRIM TO FIT) (0.500" W.T.), CS. MSS SP-75, (WPHY70)	1
	TOTAL	3,000.0'

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-020	30" PIPELINE ALIGNMENT
12361-180C-022	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P9	ISSUED FOR REVIEW	SL	5/29/09	CFE	5/29/09		
P8	ISSUED FOR REVIEW	SL	5/06/09				
P7	PRELIMINARY	SL	4/20/09				
P6	DRAWING NOT ISSUED						
P5	DRAWING NOT ISSUED						
P4	DRAWING NOT ISSUED						
P3	DRAWING NOT ISSUED						
P2	DRAWING NOT ISSUED						

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

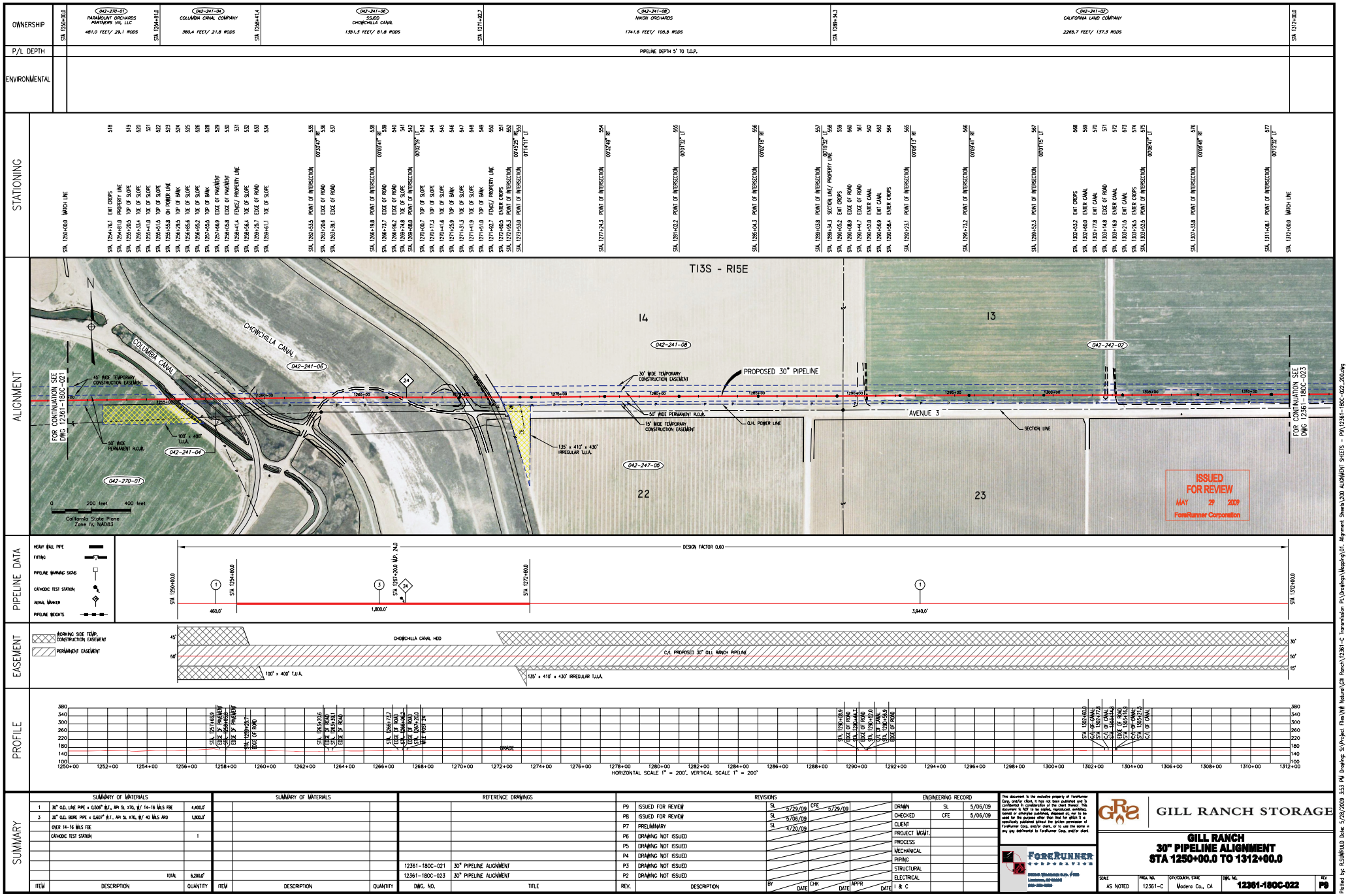
ForeRunner Corporation

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
STA 1220+00.0 TO 1250+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Madera Co., CA	12361-180C-021	P9

Plotted by: SLAGRA Date: 5/29/2009 4:03 PM Drawing: S:\Project Files\WIP Network\GR Ranch\12361-C Transmission P/L\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - P9\12361-180C-021_200.dwg


OWNERSHIP
042-270-01 PARAMOUNT ORCHARDS PARTNERS VAL, LLC 481.0 FEET/ 29.1 RODS
042-241-04 COLUMBIA CANAL COMPANY 360.4 FEET/ 21.8 RODS
042-241-06 SJJCID CHOWCHILLA CANAL 1,511.5 FEET/ 91.8 RODS
042-241-08 NIKON ORCHARDS 1741.6 FEET/ 105.8 RODS
042-242-02 CALIFORNIA LAND COMPANY 2268.7 FEET/ 137.5 RODS
P/L DEPTH
PIPELINE DEPTH 5' TO T.O.P.
ENVIRONMENTAL
STATIONING
ALIGNMENT
T13S - R15E
CHOWCHILLA CANAL
COLUMBIA CANAL
042-241-06
042-241-08
042-242-02
042-241-04
042-270-01
042-247-06
PROPOSED 30" PIPELINE
30' WIDE TEMPORARY CONSTRUCTION EASEMENT
50' WIDE PERMANENT R.O.W.
15' WIDE TEMPORARY CONSTRUCTION EASEMENT
O.H. POWER LINE
AVENUE 3
SECTION LINE
FOR CONTINUATION SEE DWG 12361-180C-021
FOR CONTINUATION SEE DWG 12361-180C-023
ISSUED FOR REVIEW
MAY 29 2009
ForeRunner Corporation
California State Plane Zone IV, NAD83
PIPELINE DATA
HEAVY WALL PIPE
FITTING
PIPELINE MARKING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS
DESIGN FACTOR 0.60
460.0'
1,800.0'
3,940.0'
EASEMENT
WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT
CHOWCHILLA CANAL HDD
C/L PROPOSED 30" GILL RANCH PIPELINE
100' x 400' T.U.A.
135' x 410' x 430' IRREGULAR T.U.A.
PROFILE
GRADE
HORIZONTAL SCALE 1" = 200', VERTICAL SCALE 1" = 200'
SUMMARY
SUMMARY OF MATERIALS
1 30" O.D. LINE PIPE x 0.500" W.T., API 5L X70, @/ 14-16 WLS FBE 4,400.0'
3 30" O.D. BORE PIPE x 0.607" W.T., API 5L X70, @/ 40 WLS ARO 1,800.0'
OVER 14-16 WLS FBE
CATHODIC TEST STATION 1
TOTAL 6,200.0'
ITEM DESCRIPTION QUANTITY
SUMMARY OF MATERIALS
ITEM DESCRIPTION QUANTITY
REFERENCE DRAWINGS
12361-180C-021 30" PIPELINE ALIGNMENT
12361-180C-023 30" PIPELINE ALIGNMENT
DWG. NO. TITLE
REVISIONS
P9 ISSUED FOR REVIEW SL 5/29/09 CFE 5/29/09
P8 ISSUED FOR REVIEW SL 5/06/09
P7 PRELIMINARY SL 4/20/09
P6 DRAWING NOT ISSUED
P5 DRAWING NOT ISSUED
P4 DRAWING NOT ISSUED
P3 DRAWING NOT ISSUED
P2 DRAWING NOT ISSUED
REV. DESCRIPTION BY DATE CHK DATE APPR DATE
ENGINEERING RECORD
DRAWN SL 5/06/09
CHECKED CFE 5/06/09
CLIENT
PROJECT MGMT.
PROCESS
MECHANICAL
PIPING
STRUCTURAL
ELECTRICAL
I & C
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ForeRunner Corporation
GILL RANCH STORAGE
GILL RANCH
30" PIPELINE ALIGNMENT
STA 1250+00.0 TO 1312+00.0
SCALE AS NOTED
PROJ. NO. 12361-C
CITY/COUNTY, STATE Madera Co., CA
DWG. NO. 12361-180C-022
REV P9
Plotted by: R.SUMWALD Date: 5/28/2009 3:53 PM DrawPrep: S:\Project Files\NW Returns\Gill Ranch\12361-C Transmission Pl\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - PSV\12361-180C-022_200.dwg

OWNERSHIP

STA 1312+00.0

042-242-02
CALIFORNIA VALLEY LAND COMPANY
3090.3 FEET/ 187.5 RODS

STA 1342+96.3

040-152-03
CALIFORNIA VALLEY LAND COMPANY
3004.7 FEET/ 182.1 RODS

STA 1373+00.0

P/L DEPTH

PIPELINE DEPTH 5' TO T.O.P.

ENVIRONMENTAL

SENSITIVE CULTURAL RESOURCES ARE IDENTIFIED IN THIS AREA.
DETAILS ARE AVAILABLE TO QUALIFIED PERSONNEL UNDER SEPARATE COVER."

STATIONING

STA 1312+00.0 MATCH LINE 378
STA 1314+85.8 POINT OF INTERSECTION 07°18'20" RT 379
STA 1315+44.4 EXIT CROPS 380
STA 1315+53.6 POINT OF INTERSECTION 00°13'42" LT 381
STA 1315+53.6 OH POWER LINE 382
STA 1315+57.5 ENTER CANAL 383
STA 1315+68.3 EXIT CANAL 384
STA 1315+78.1 EDGE OF ROAD 385
STA 1315+92.5 EDGE OF ROAD 386
STA 1316+07.4 ENTER CANAL 387
STA 1316+08.5 EXIT CANAL 388
STA 1316+83.4 POINT OF INTERSECTION 00°03'00" LT 389
STA 1321+81.8 POWER POLE, 10.3' LT. 390
STA 1321+85.5 OH POWER LINE 391
STA 1321+99.4 POINT OF INTERSECTION 00°12'19" RT 392

STA 1326+42.4 POINT OF INTERSECTION 07°18'50" LT 393
STA 1328+68.2 POINT OF INTERSECTION 07°16'00" RT 394
STA 1328+76.5 EXIT CROPS 395
STA 1328+82.0 ENTER CANAL 396
STA 1328+99.2 EXIT CANAL 397
STA 1329+05.1 EDGE OF ROAD 398
STA 1329+24.3 EDGE OF ROAD 399
STA 1329+29.7 ENTER CANAL 400
STA 1329+37.1 EXIT CANAL 401
STA 1329+40.8 ENTER DROPS 402
STA 1330+44.0 POINT OF INTERSECTION 00°02'20" LT 403

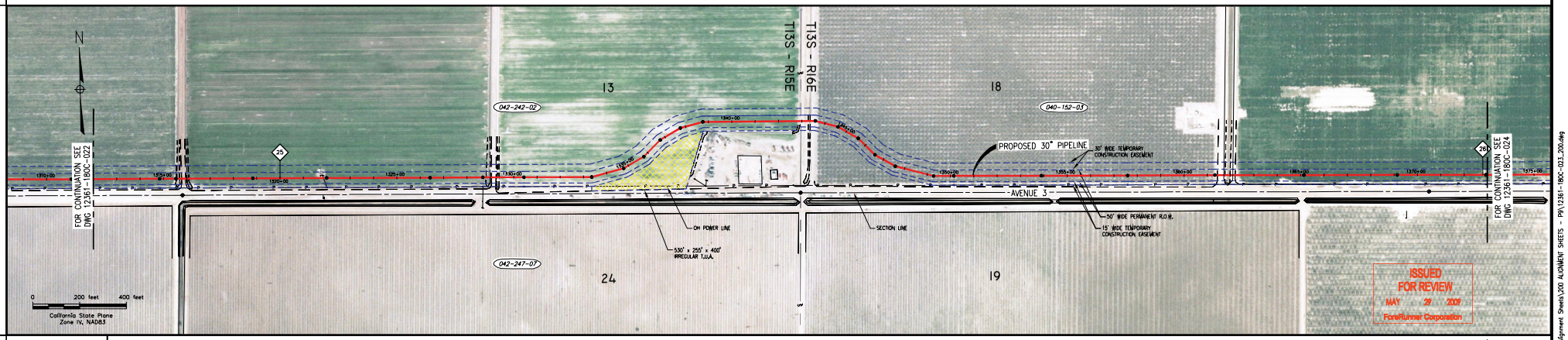
STA 1333+34.6 POINT OF INTERSECTION 14°59'02" LT 404
STA 1334+78.4 POINT OF INTERSECTION 15°00'00" LT 405
STA 1335+76.4 POINT OF INTERSECTION 15°16'41" LT 406
STA 1336+76.4 POINT OF INTERSECTION 15°00'02" RT 407
STA 1337+76.4 POINT OF INTERSECTION 14°59'59" RT 408
STA 1338+76.4 POINT OF INTERSECTION 14°59'59" RT 409

STA 1342+95.3 RANGE, SECTION & PROPERTY LINE 412
STA 1343+28.0 ENTER CANAL 413
STA 1343+35.9 EXIT CANAL 414
STA 1343+60.2 ENTER DROPS 415
STA 1343+68.3 POINT OF INTERSECTION 15°00'00" RT 416
STA 1344+68.3 POINT OF INTERSECTION 14°59'58" RT 417
STA 1346+68.3 POINT OF INTERSECTION 15°00'04" RT 418
STA 1346+68.3 POINT OF INTERSECTION 15°16'43" LT 419
STA 1347+68.3 POINT OF INTERSECTION 14°59'59" LT 420
STA 1349+27.5 POINT OF INTERSECTION 14°27'06" LT 421
STA 1350+13.9 POINT OF INTERSECTION 00°05'49" RT 422

STA 1353+88.1 POINT OF INTERSECTION 00°02'49" LT 424
STA 1357+58.6 POINT OF INTERSECTION 00°11'16" LT 425
STA 1361+31.1 EXIT CROPS 427
STA 1361+32.7 POINT OF INTERSECTION 00°22'40" RT 428
STA 1361+43.4 EDGE OF ROAD 429
STA 1361+76.1 ENTER CANAL 430
STA 1361+97.8 EXIT CANAL 431
STA 1362+19.5 EDGE OF ROAD 433
STA 1362+34.1 ENTER DROPS 434

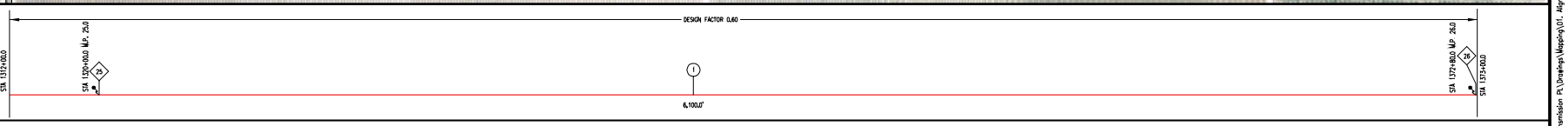
STA 1365+13.9 POINT OF INTERSECTION 00°14'08" LT 435
STA 1369+13.8 POINT OF INTERSECTION 00°07'35" RT 436
STA 1372+84.3 POINT OF INTERSECTION 00°11'40" LT 437
STA 1373+00.0 MATCH LINE

ALIGNMENT



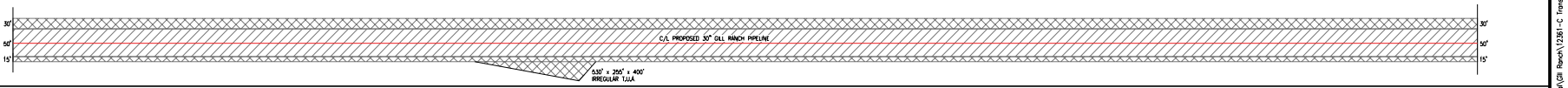
PIPELINE DATA

HEAVY WALL PIPE
FITTING
PIPELINE MARKING SIGNS
CATHODIC TEST STATION
AERIAL MARKER
PIPELINE WEIGHTS

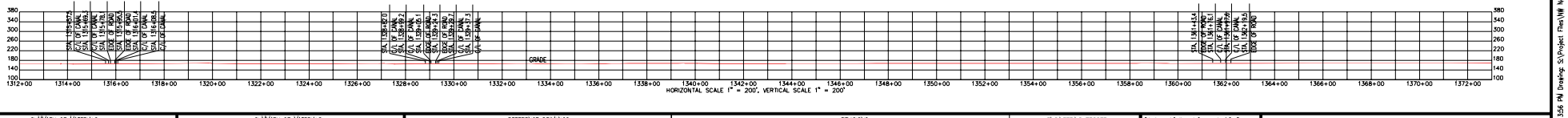


EASEMENT

WORKING SIDE TEMP. CONSTRUCTION EASEMENT
PERMANENT EASEMENT



PROFILE



SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE	6,100.0'
	CATHODIC TEST STATION	2
	TOTAL	6,100.0'

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-022	30" PIPELINE ALIGNMENT
12361-180C-024	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P9	ISSUED FOR REVIEW	SL	5/29/09	CFE	5/29/09		
P8	ISSUED FOR REVIEW	SL	5/06/09				
P7	PRELIMINARY	SL	4/20/09				
P6	DRAWING NOT ISSUED						
P5	DRAWING NOT ISSUED						
P4	DRAWING NOT ISSUED						
P3	DRAWING NOT ISSUED						
P2	DRAWING NOT ISSUED						

ENGINEERING RECORD

DRAWN	SL	5/06/09
CHECKED	CFE	5/06/09
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

ForeRunner Corporation
3300 Whitewood Ave. / Ste
Lincoln, CA 95648
916-434-1000

GILL RANCH STORAGE

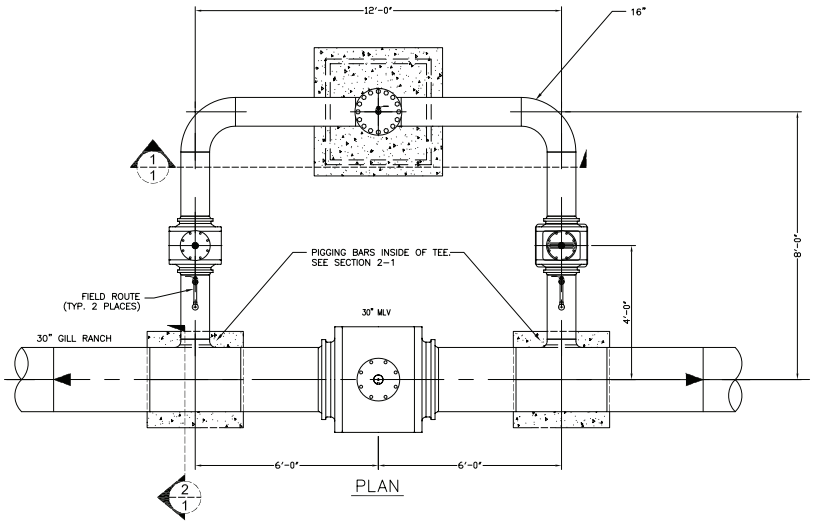
GILL RANCH
30" PIPELINE ALIGNMENT
STA 1312+00.0 TO 1373+00.0

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361-C	Madera Co., CA	12361-180C-023	P9

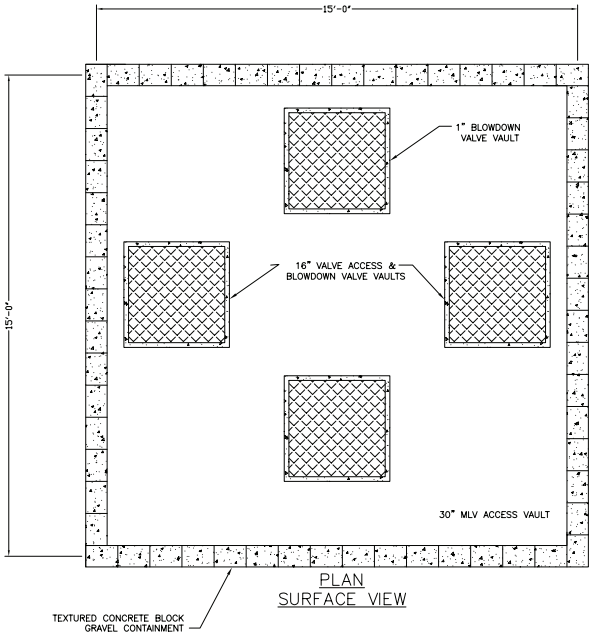
Plotted by: R.SCARVALO Date: 5/29/2009 3:56 PM Drawing: S:\Project Files\NW Natural\Gill Ranch\12361-C Transmission Pl.\Drawings\Mapping\01. Alignment Sheets\200 ALIGNMENT SHEETS - PSV\12361-180C-023_200.dwg

APPENDIX A.3

GAS PIPELINE SURFACE FACILITY DETAILS



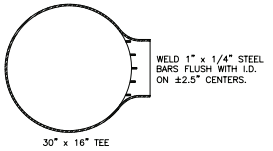
PLAN



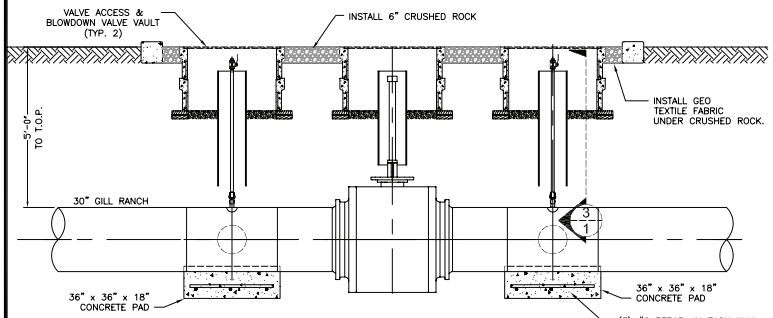
PLAN
SURFACE VIEW

NOTE:
CENTER VALVE EXTENSION IN VAULT

FIELD COAT ALL BARE SURFACES WITH 2 PART EPOXY COATING POWERCRETE J 2.5 MIL MINIMUN



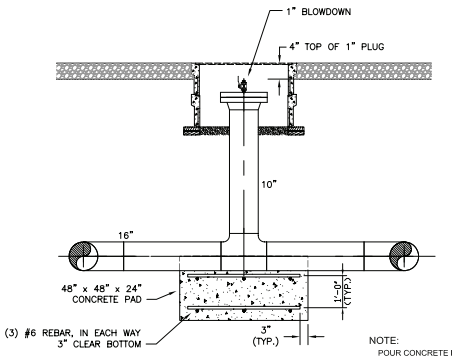
SECTION 2-1



ELEVATION

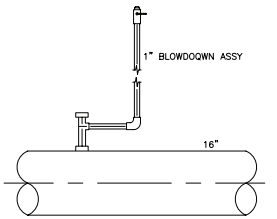
NOTE:
POUR CONCRETE FOOTINGS AGAINST UNDISTURBED SOIL.

NOTE:
POUR CONCRETE FOOTINGS AGAINST UNDISTURBED SOIL. WRAP PIPE WITH ROCK SHIELD IN FOOTING AREA.



SECTION 1-1

NOTE:
POUR CONCRETE FOOTINGS AGAINST UNDISTURBED SOIL. WRAP PIPE WITH ROCK SHIELD IN FOOTING AREA.



SECTION 3-1

PRELIMINARY
NOT FOR CONSTRUCTION
APRIL 11 2008
ForeRunner Corporation

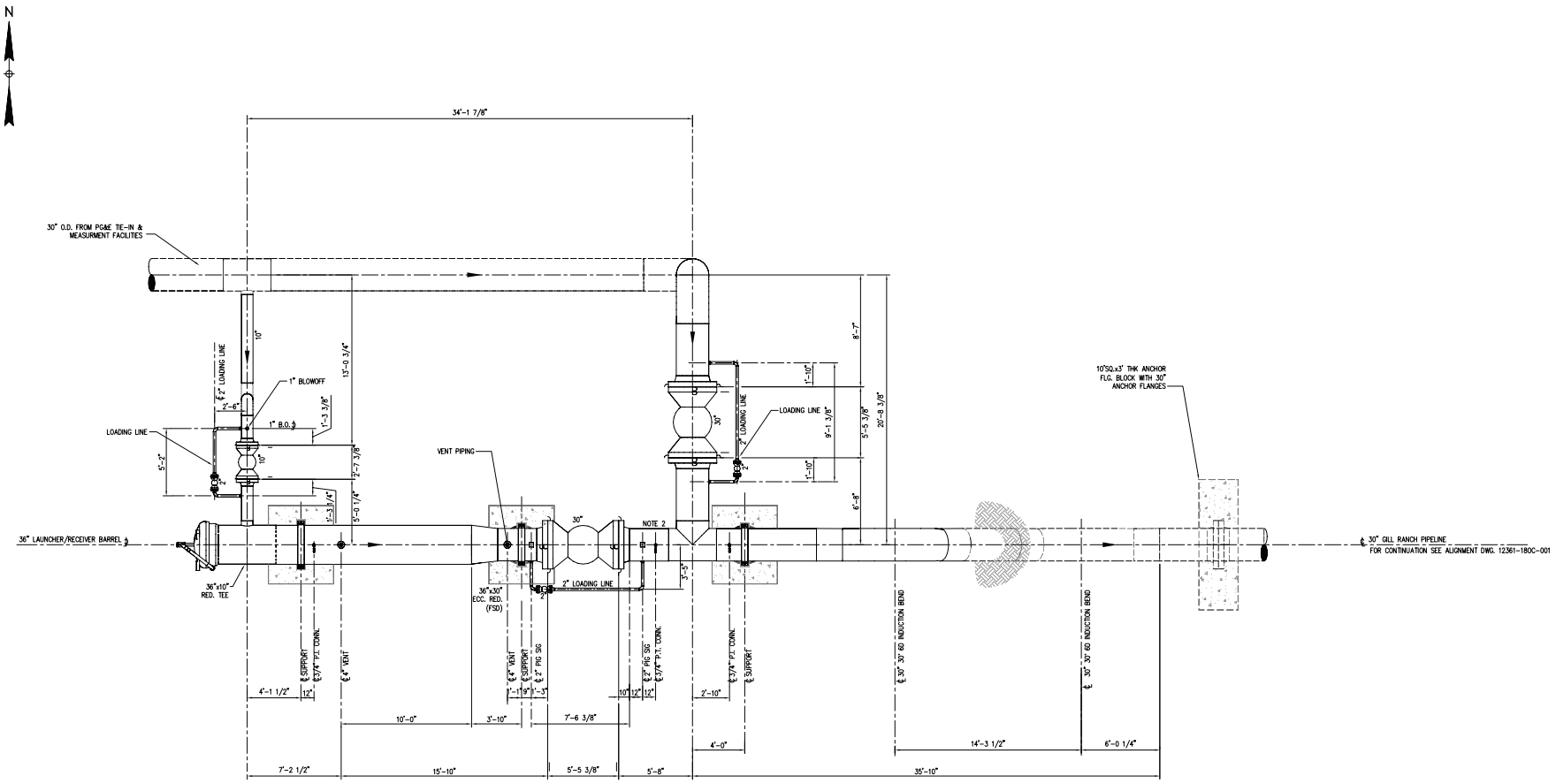
REFERENCE DRAWINGS		REVISIONS							ENGINEERING RECORD		
									DRAWN	CFE	2/8/08
									CHECKED		
									CLIENT		
									PROJECT MGMT.		
									PROCESS		
									MECHANICAL		
		P2	PRELIMINARY	CFE	4/11/08	CG	4/11/08		PIPING		
12361-180C-006	30" PIPELINE ALIGNMENT	P1	PRELIMINARY	CFE	2/27/08	CG	2/27/08		STRUCTURAL		
DWG. NO.	TITLE	REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	ELECTRICAL		
								DATE	I & C		

FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH
30" MAIN LINE VALVE
PIPING PLAN, SECTIONS AND DETAILS

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV.
AS SHOWN	12361-B	Madera/Fresno Co. Calif.	12361-170C-100	P2



PLAN
SCALE 1/4"=1'-0"

PRELIMINARY
NOT FOR CONSTRUCTION
APRIL 11 2008
ForeRunner Corporation

NOTES:

1. FIELD TO VERIFY ALL DIMENSIONS, ELEVATIONS AND VALVE ORIENTATIONS BEFORE FABRICATION.
2. CONTRACTOR IS TO INSTALL SCRAPER GUIDE BARS IN 30" TEE IN ACCORDANCE WITH DWG. 12361-1700-____.
3. TAPER BORE PIPELINE SIDE OF 30" SCH. 30 FABRICATION PIPING TO --- W.T. WELD TO 30" O.D., --- W.T., TRANSITION PIPE.

REFERENCE DRAWINGS		REVISIONS						ENGINEERING RECORD		
								DRAWN	N.NEW	08/13/07
								CHECKED		
								CLIENT		
								PROJECT MGMT.		
								PROCESS		
								MECHANICAL		
		P2	PRELIMINARY	PJD	4/11/08	CFE	4/11/08	PIPING		
12361-180C-001	ALIGNMENT DRAWING	P1	PRELIMINARY	PJD	2/27/08	CFE	2/27/08	STRUCTURAL		
DWG. NO.	TITLE	REV.	DESCRIPTION	BY	DATE	CHK	APPR DATE	ELECTRICAL		
								I & C		

FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH
30" LAUNCHER/RECEIVER
PIPING PLAN

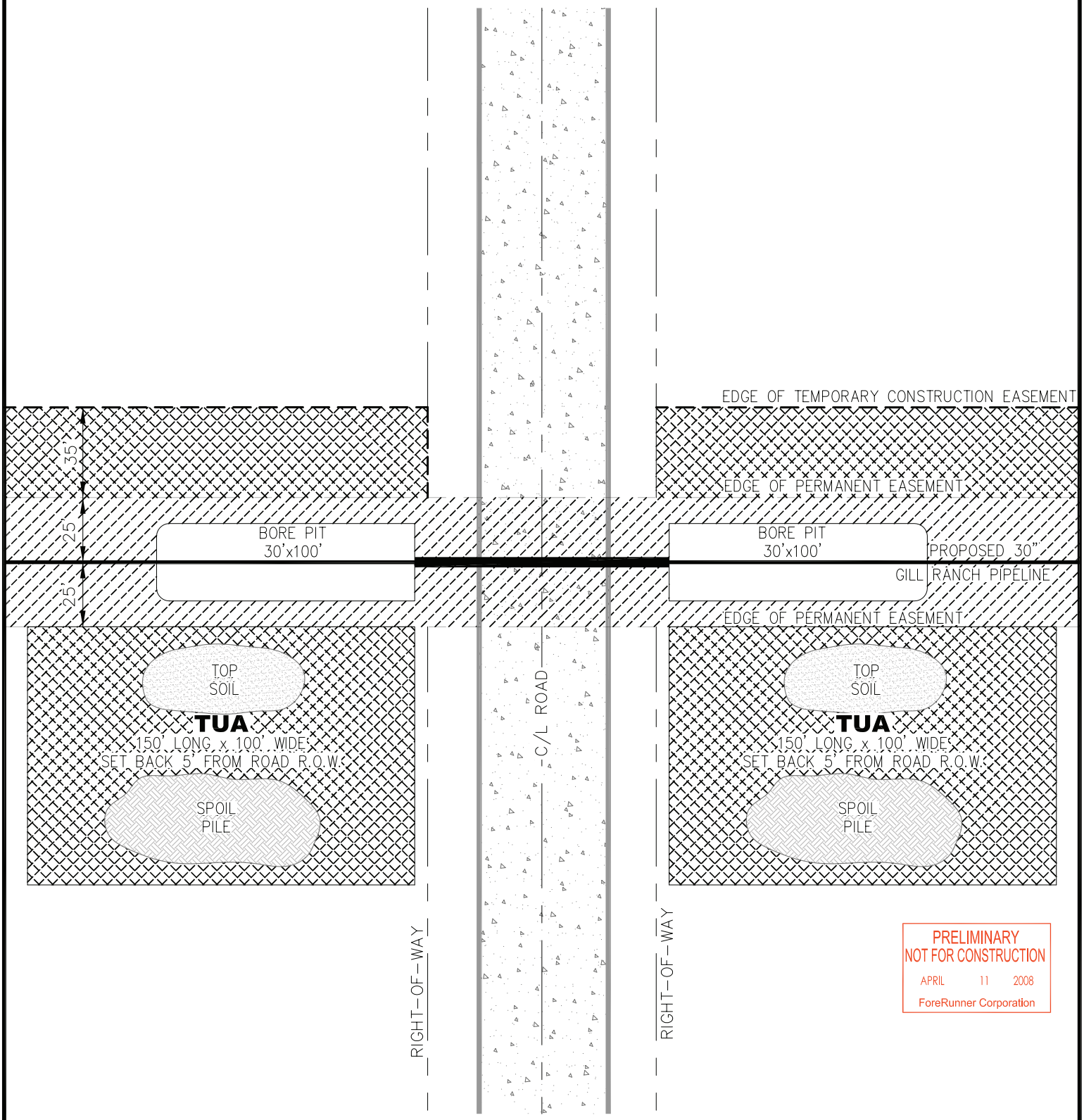
SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
1/4"=1'-0"	12361-B	Madera/Fresno Co. Calif.	12361-170C-101	P2

APPENDIX A.4

GAS PIPELINE TYPICAL SPECIFICATIONS

Typical Uncased Road Crossing Plan

Document No.
12361-180C-603



PRELIMINARY
NOT FOR CONSTRUCTION
APRIL 11 2008
ForeRunner Corporation

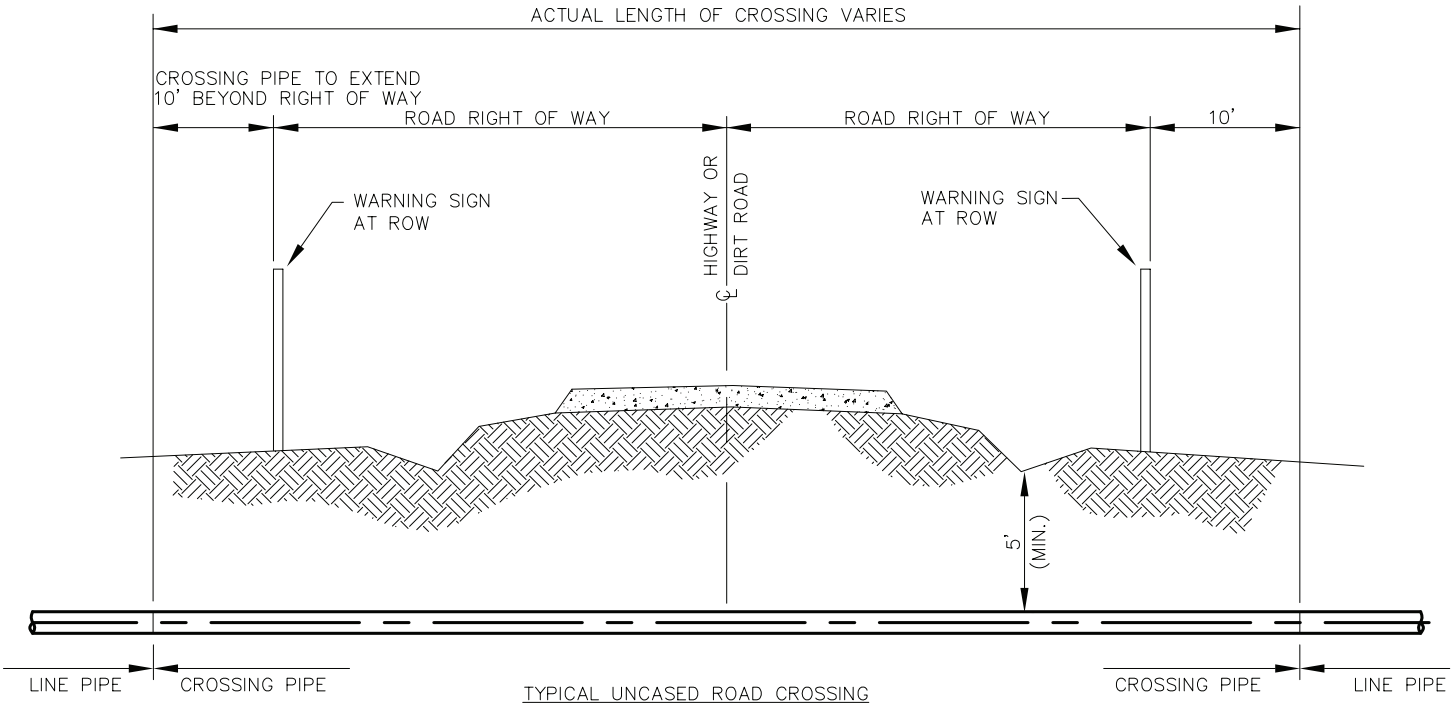
GILL RANCH STORAGE

FORERUNNER CORPORATION
2900 S. Wadsworth Blvd. #600
Lakewood, CO 80235
303-989-0223

NO.	DESCRIPTION		
P3	PRELIMINARY		4/11/08
CHECKED	DATE	APPROVED	DATE
R. STONE	01/15/08		

Typical Uncased Road Crossing Section

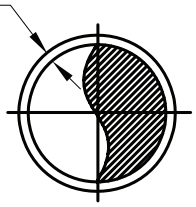
Document No.
12361-180C-604



TYPICAL UNCASED ROAD CROSSING
OPEN CUT OR BORE

NOTES:
1. CROSSING SHALL BE IN ACCORDANCE WITH APPLICABLE PERMIT.
2. ROAD CROSSING PIPE SHALL EXTEND TO A MINIMUM OF RIGHT OF WAY LINE PLUS 10' EACH SIDE.
3. THE TYPE AND MINIMUM REQUIRED LENGTH OF PIPE FOR CROSSING OF PUBLIC ROADS SHALL BE AS SPECIFIED ON MAPS ON ALIGNMENT SHEETS.
4. ALL BORED CROSSING PIPE SHALL HAVE 40 MILS OF POWERCRETE J PROTECTION DURING INSERTION. PIPE FOR OPEN CUT CROSSING DOES NOT REQUIRE EXTRA COATING.
5. CROSSING SHALL BE A MINIMUM OF 5' BELOW PAVED SURFACE FOR ALL STATE AND US HIGHWAYS.
6. OPPOSITE HAND ORIENTATION MAY BE VALID FOR A GIVEN CROSSING.

BORE ANNULUS TO BE NO LARGER THAN 1" GREATER THAN COATED LINE PIPE



PRELIMINARY
NOT FOR CONSTRUCTION
APRIL 11 2008
ForeRunner Corporation

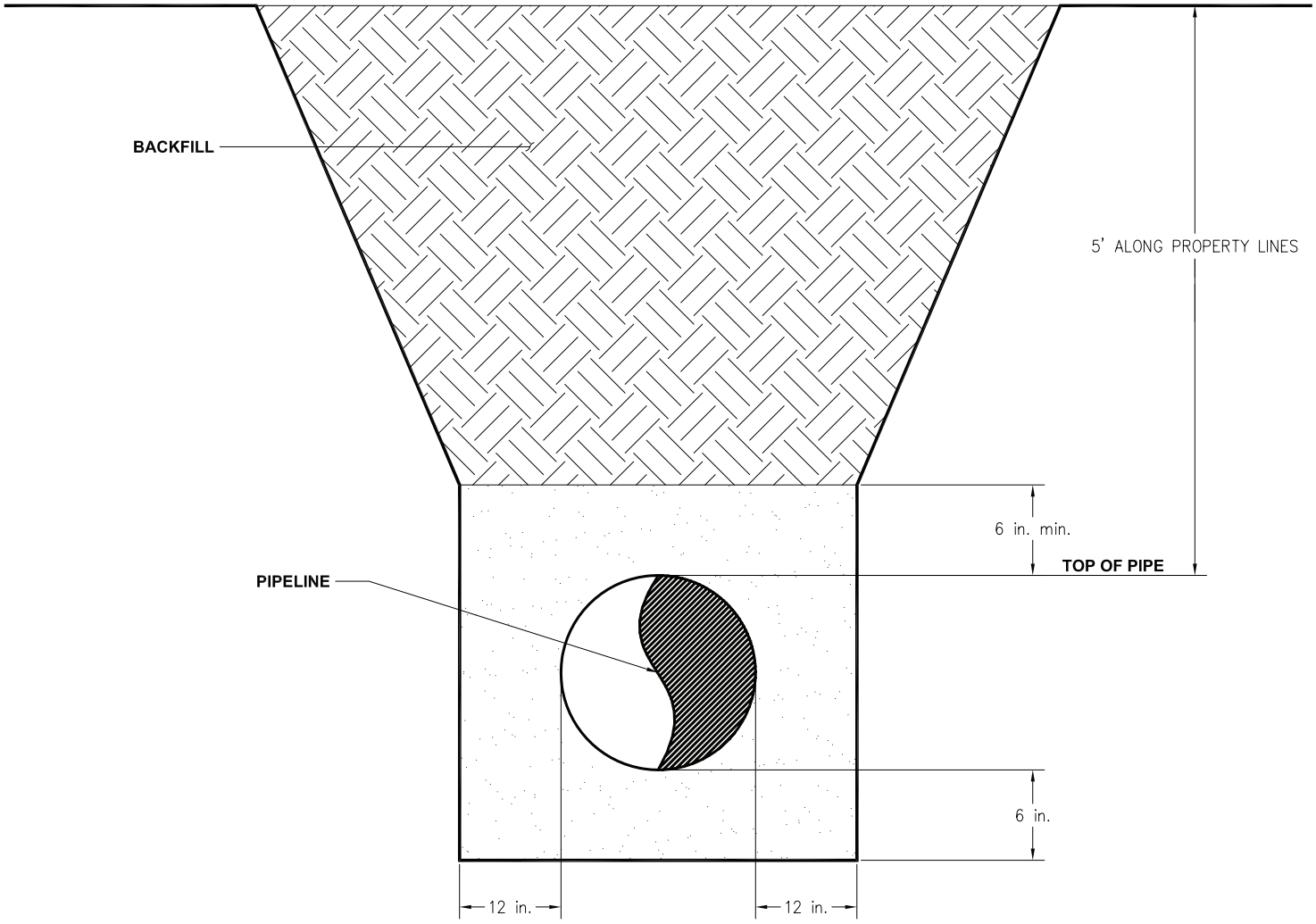
GILL RANCH STORAGE

FORERUNNER CORPORATION
2900 S. Wadsworth Blvd. #600
Lakewood, CO 80235
303-989-0223

NO.	DESCRIPTION		
P3	PRELIMINARY		4/11/08
CHECKED	DATE	APPROVED	DATE
R. STONE	01-15-08		

Typical Pipe Trench Cross Section

Document No.
12361-180C-605



TYPICAL CROSS SECTION

NOTE:
ALL FILL TO BE NATIVE SOIL UNLESS NATIVE SOIL IS NOT ACCEPTABLE FOR THE PORTION AROUND THE PIPE.
IF NATIVE SOIL IS FOUND NOT SUITABLE, SAND PADDING OR SELECTED FILL TO BE USED AS REQUIRED BY CODE.

NOT TO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION
APRIL 11 2008
ForeRunner Corporation

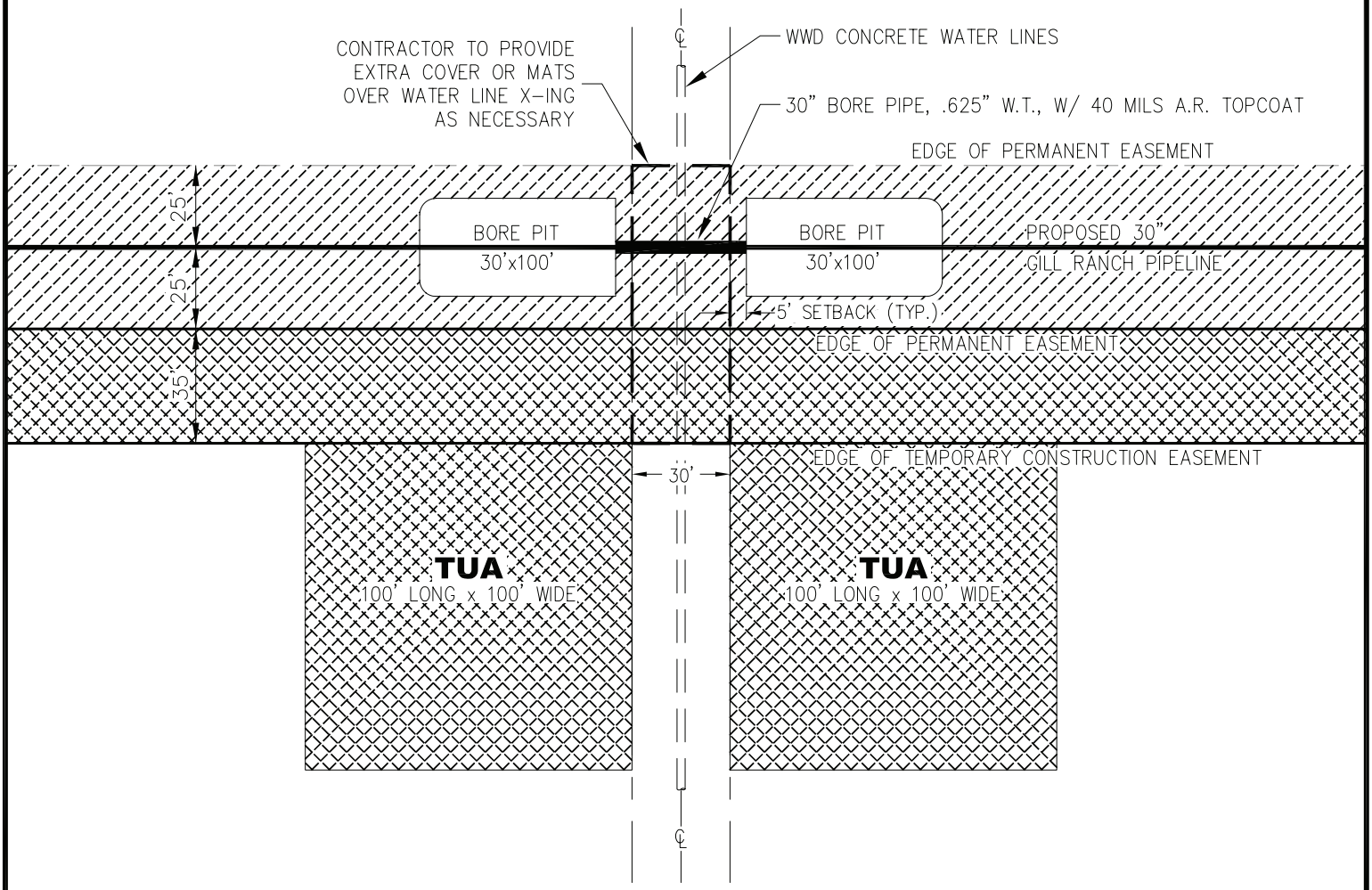
GILL RANCH STORAGE

FORERUNNER CORPORATION
2900 S. Wadsworth Blvd. #600
Lakewood, CO 80235
303-989-0223

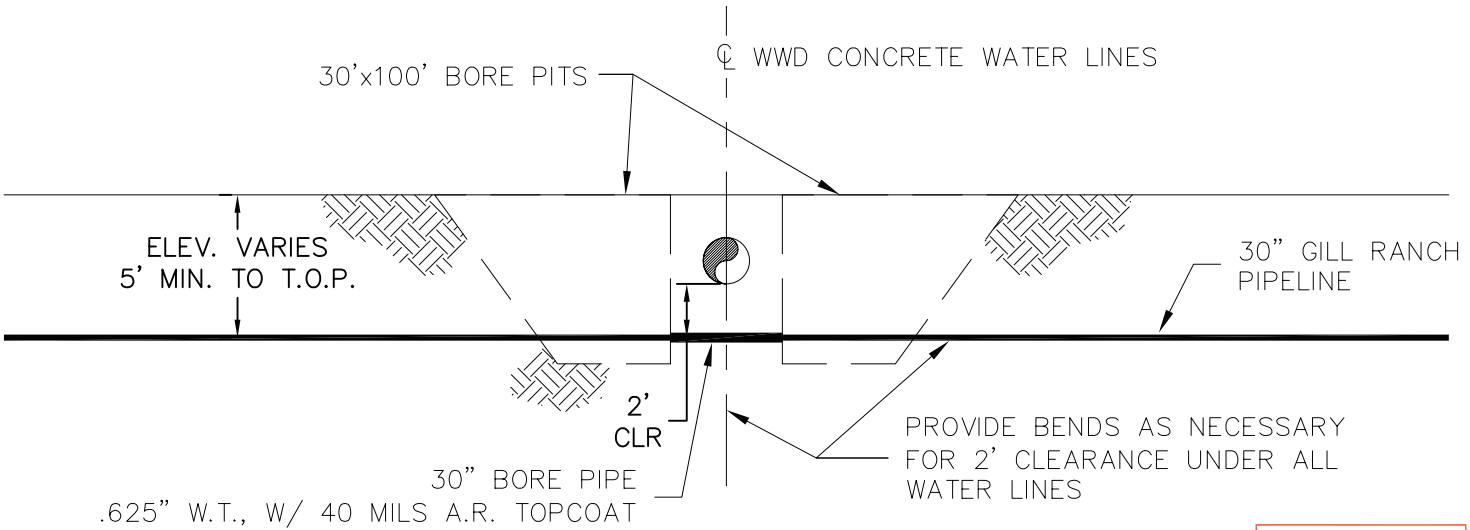
NO.	DESCRIPTION		
P4	PRELIMINARY		4/11/08
CHECKED	DATE	APPROVED	DATE
R. STONE	02/08/08		

Typ. WWD Conc. Water Line Crossing (Bored)

Document No.
12361-180C-606



PLAN



ELEVATION

PRELIMINARY
NOT FOR CONSTRUCTION
APRIL 11 2008
ForeRunner Corporation

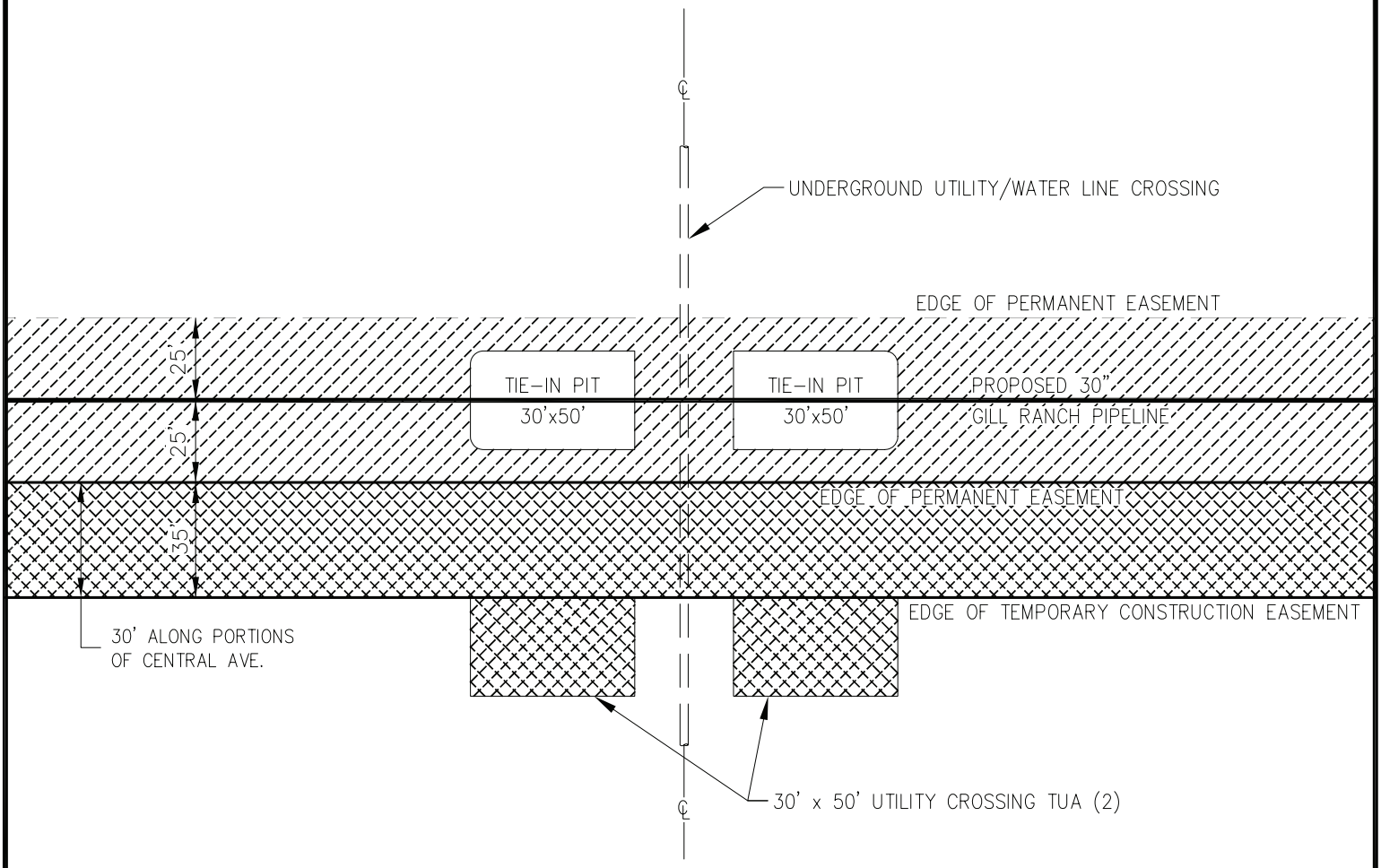
GILL RANCH STORAGE

FORERUNNER CORPORATION
3900 S. Wadsworth Blvd. #600
Lakewood, CO 80235
303-989-0222

NO.	DESCRIPTION		
P3	PRELIMINARY		4/11/08
CHECKED	DATE	APPROVED	DATE
R. STONE	01/15/08		

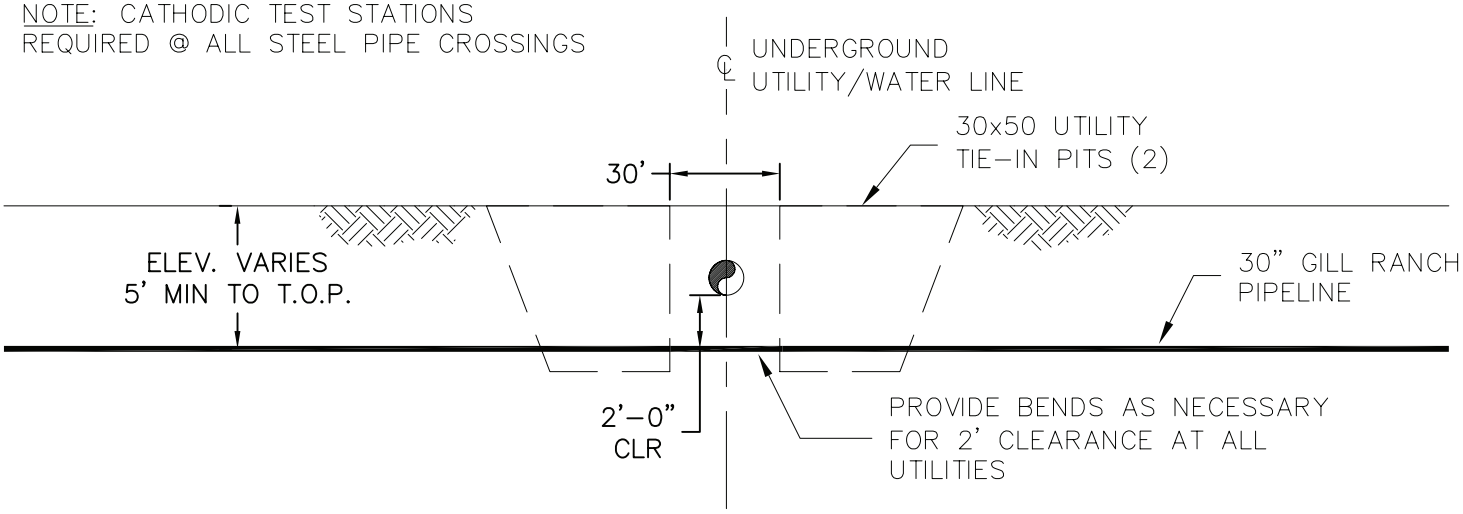
Typical Steel Water line/Utility Crossing

Document No.
12361-180C-607



PLAN

NOTE: CATHODIC TEST STATIONS
REQUIRED @ ALL STEEL PIPE CROSSINGS



SECTION

PRELIMINARY
NOT FOR CONSTRUCTION
APRIL 11 2008
ForeRunner Corporation

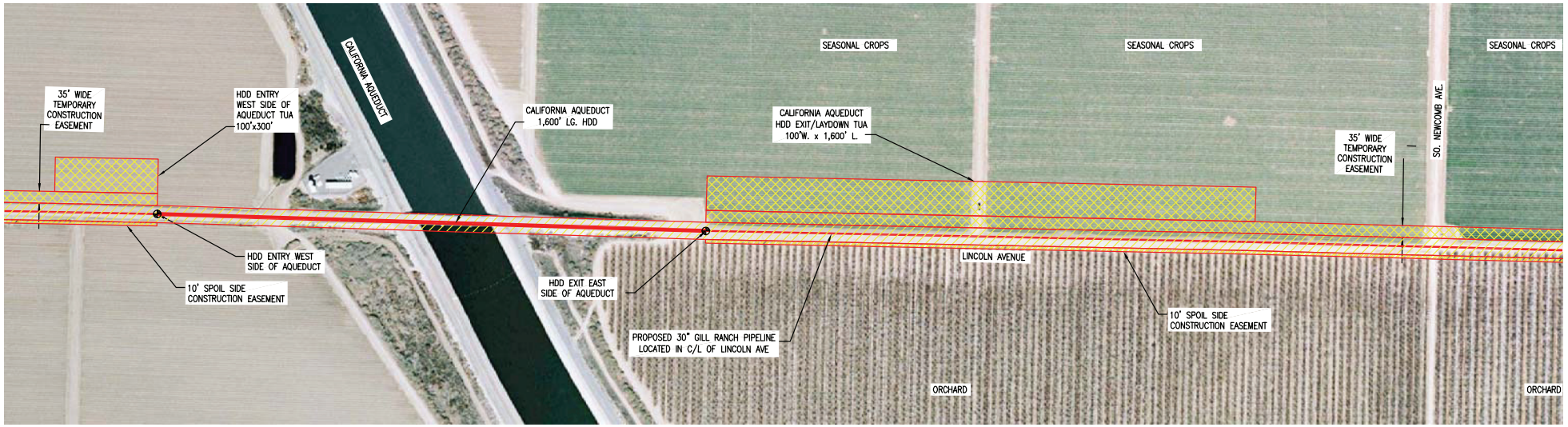
GILL RANCH STORAGE

FORERUNNER CORPORATION
3900 S. Wadsworth Blvd. #600
Lakewood, CO 80235
303-989-0223

NO.	DESCRIPTION		
P3	PRELIMINARY		4/11/08
CHECKED	DATE	APPROVED	DATE
R. STONE	01/15/08		

APPENDIX A.5

GAS PIPELINE CROSSING DETAILS



PLAN VIEW

SCALE 1" = 300' HORIZONTAL

REF. ALIGN. DWG. 12361-180C-002

SCALE 1"=300'

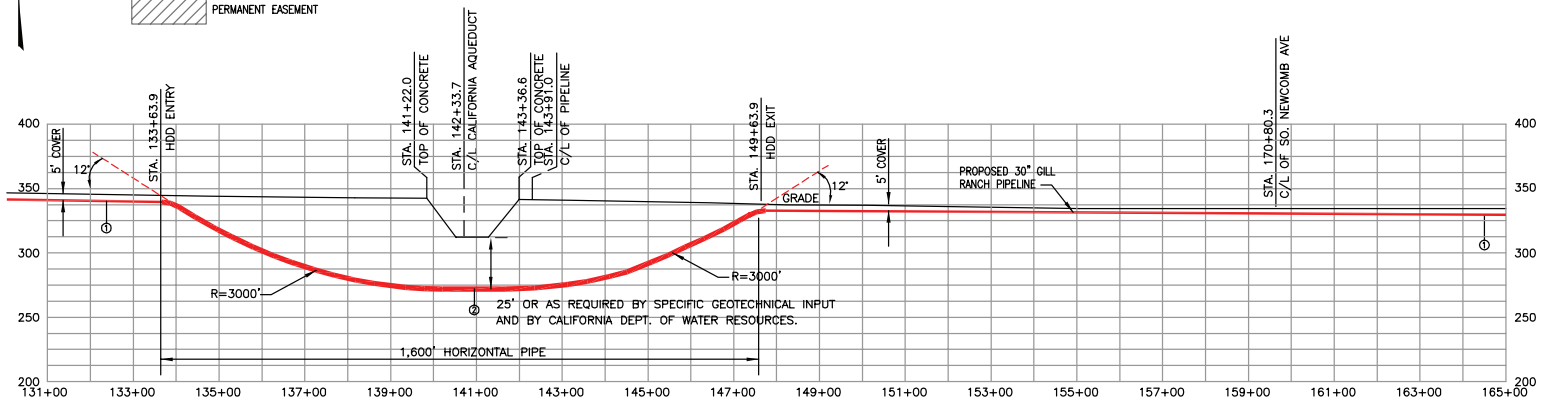
300 0 300 600 FEET

CA-ZONE IV, FEET NAD 83

N

TEMP. CONSTRUCTION EASEMENT

PERMANENT EASEMENT



PROFILE VIEW

HORIZONTAL SCALE 1" = 300',VERTICAL SCALE 1" = 100'

PRELIMINARY NOT FOR CONSTRUCTION
JUNE 5 2008
ForeRunner Corporation

SUMMARY

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE	-
2	30" O.D. BORE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE AND 40 MILS THICK ABRASION RESISTANT TOP COAT	1,600'

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-002	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P4	ISSUE FOR PERMIT	PJD	6/3/08	CFE	6/4/08		
P3	PRELIMINARY	PJD	4/11/08	CFE	4/11/08		
P2	PRELIMINARY	CMC	2/27/08	CFE	2/27/08		
P1	PRELIMINARY	SL	2/06/08	CFE	2/08/08		

ENGINEERING RECORD

DRAWN	PJD	6/3/08
CHECKED	CFE	6/4/08
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

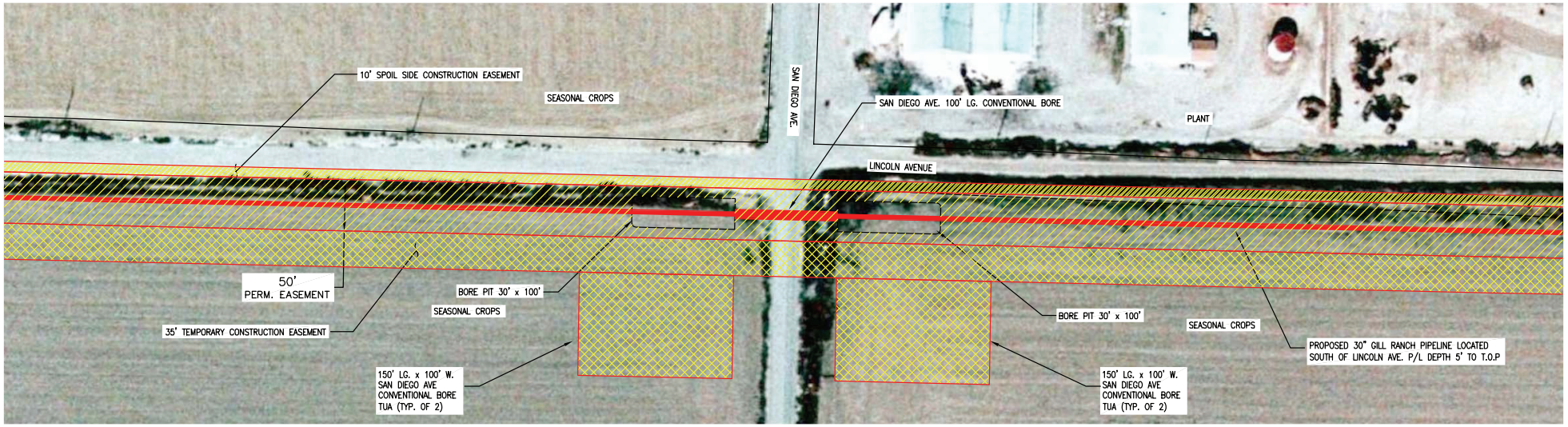
FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
CALIFORNIA AQUEDUCT
HORIZONTAL DIRECTIONAL DRILL

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361C	Madera/Fresno Co., CA	12361-180C-101	P4

Plotted by: MCROWNES Date: 7/7/2008 12:26 PM Drawing: S:\Project Files\WM Natural\Gill Ranch\12361-C Transmission PL\Drawings\Mapping\02. Drawings\12361-180C-101.dwg



PLAN VIEW

SCALE 1" = 100' HORIZONTAL
REF. ALIGN. DWG.
12361-180C-001

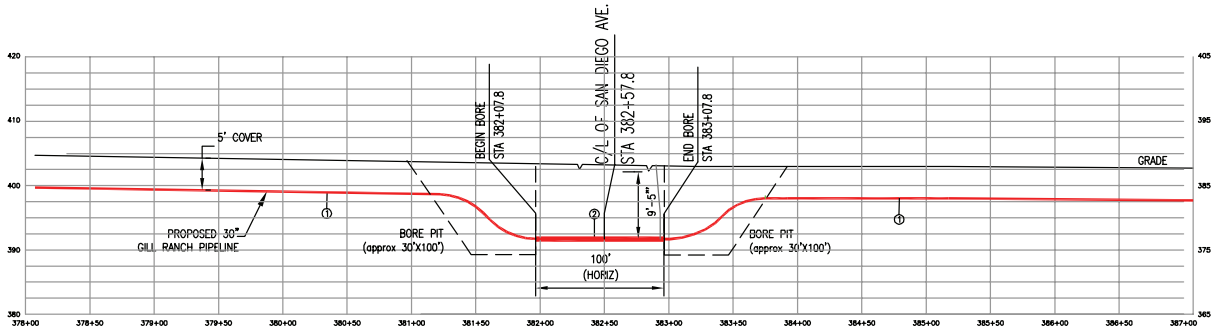
N

SCALE 1"=100'
50 0 50 100 FEET
CA-ZONE IV, FEET
NAD 83

WORKING SIDE TEMP. CONSTRUCTION EASEMENT

PERMANENT EASEMENT

SPOIL SIDE TEMP. CONSTRUCTION EASEMENT



PROFILE VIEW

HORIZONTAL SCALE 1" = 100',VERTICAL SCALE 1" = 20'

PRELIMINARY
NOT FOR CONSTRUCTION
JUNE 5 2008
ForeRunner Corporation

SUMMARY

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE	
2	30" O.D. BORE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE	
	AND 40 MILS THICK ABRASION RESISTANT TOP COAT	100.0'

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-003	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P2	ISSUE FOR PERMIT	PJD	6/4/08	CFE	6/4/08		
P1	PRELIMINARY	MP	4/11/08	CFE	4/11/08		

ENGINEERING RECORD

DRAWN	PJD	6/4/08
CHECKED	CFE	6/4/08
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

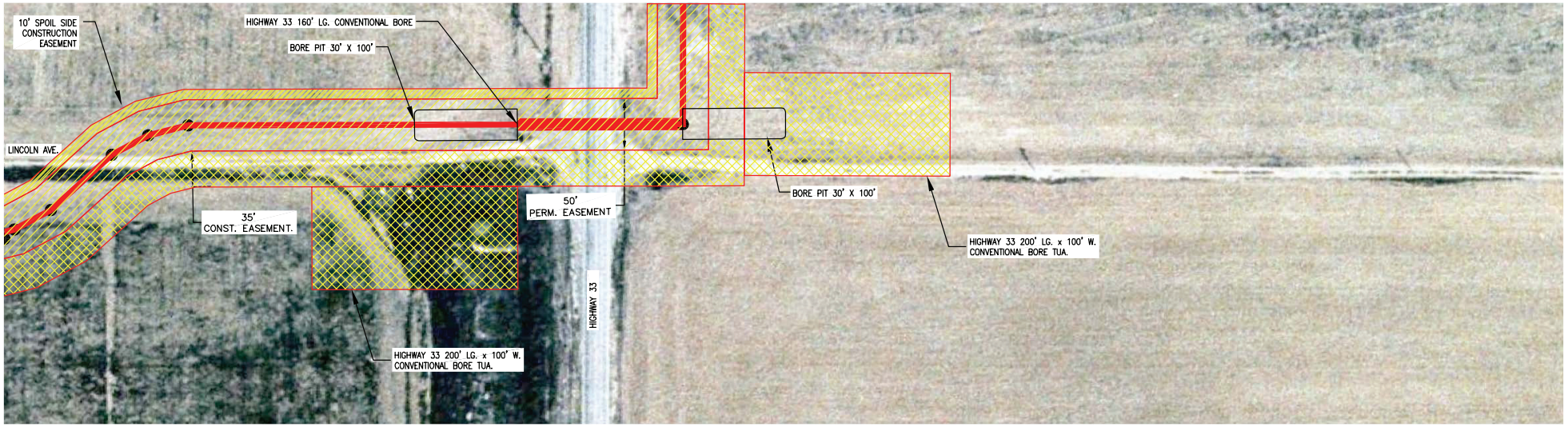
FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
SAN DIEGO AVE
CONVENTIONAL BORE

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361C	Madera/Fresno Co., CA	12361-180C-102	P2

Plotted by: MCROWNES Date: 7/7/2008 12:28 PM Drawing: S:\Project Files\WM Natural\Gill Ranch\12361-C Transmission PL\Drawings\Mapping\02. Crossings\12361-180C-102.dwg



PLAN VIEW

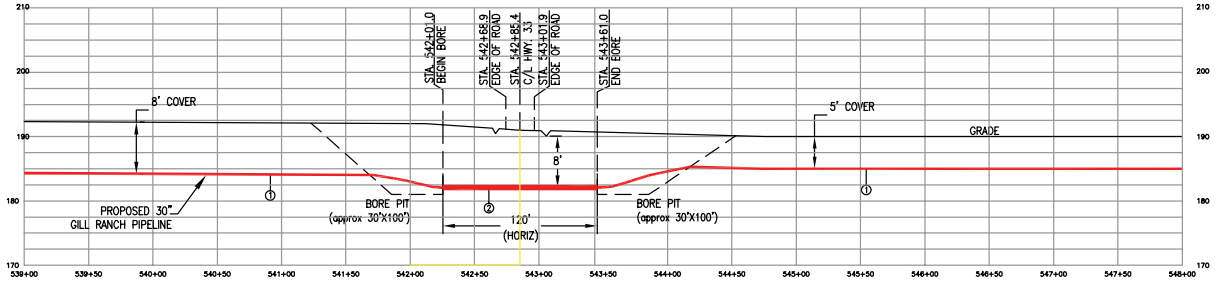
SCALE 1" = 100' HORIZONTAL
REF. ALIGN. DWG.
12361-180C-005

SCALE 1"=100'
50 0 50 100 FEET
CA-ZONE IV, FEET
NAD 83

N

TEMP. CONSTRUCTION EASEMENT

PERMANENT EASEMENT



PROFILE VIEW

HORIZONTAL SCALE 1" = 100',VERTICAL SCALE 1" = 20'

PRELIMINARY
NOT FOR CONSTRUCTION
JUNE 5 2008
ForeRunner Corporation

SUMMARY

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE	
2	30" O.D. BORE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE AND 40 MILS THICK ABRASION RESISTANT TOP COAT	160.0'

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-005	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P4	ISSUE FOR PERMIT	PJD	6/4/08	CFE	6/4/08		
P3	PRELIMINARY	PJD	4/11/08	CFE	4/11/08		
P2	PRELIMINARY	MP	2/27/08	CFE	2/27/08		
P1	PRELIMINARY	MP	1/30/08	CFE	2/8/08		

ENGINEERING RECORD

DRAWN	PJD	6/4/08
CHECKED	CFE	6/4/08
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

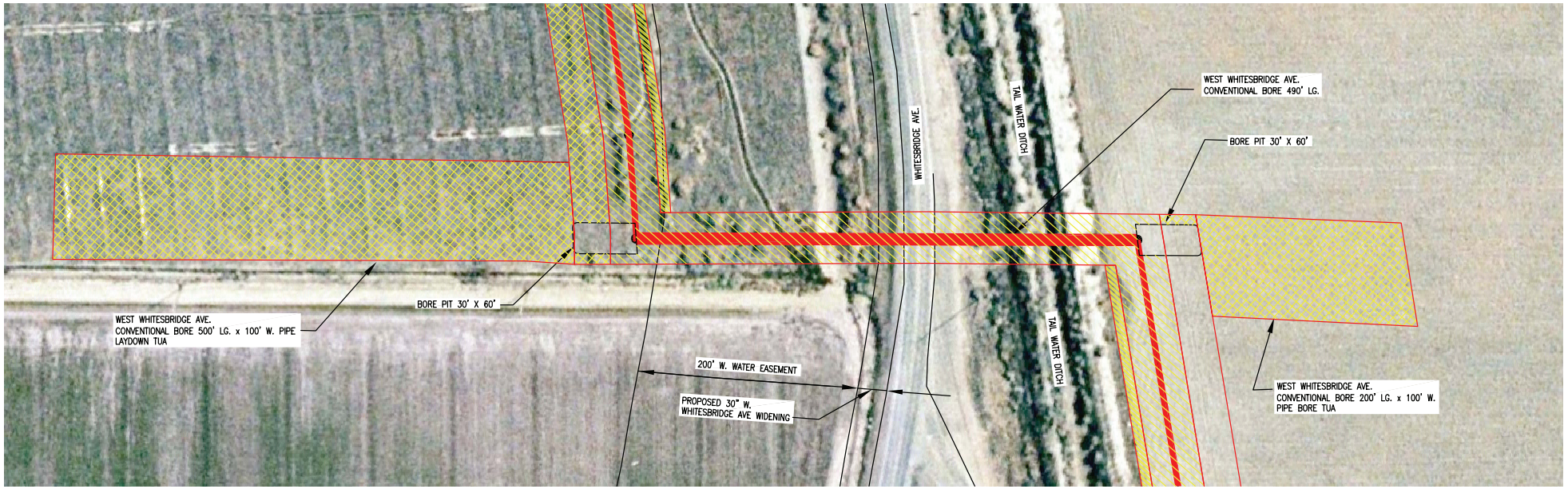
FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
HIGHWAY 33
CONVENTIONAL BORE

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361C	Madera/Fresno Co., CA	12361-180C-103	P4

Plotted by: MCROWNES Date: 7/7/2008 12:31 PM Drawing: S:\Project Files\WM Natural\Gill Ranch\12361-C Transmission PL\Drawings\Mapping\02. Crossings\12361-180C-103.dwg



PLAN VIEW

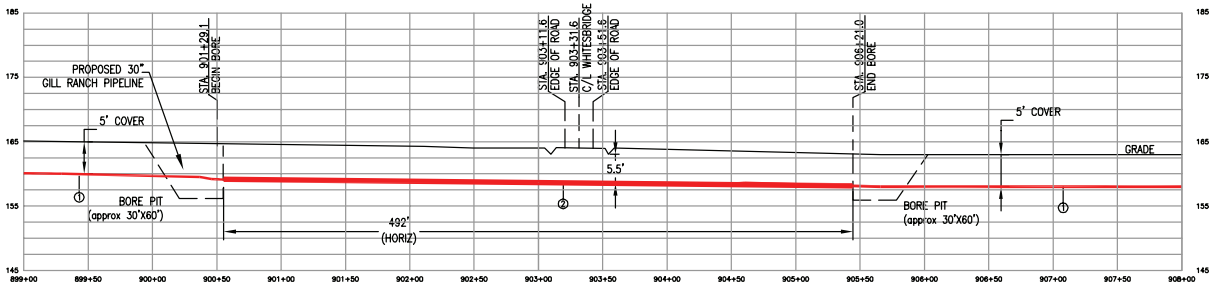
SCALE 1" = 100' HORIZONTAL
REF. ALIGN. DWG.
12361-180C-007

N

SCALE 1"=100'
50 0 50 100 FEET
CA-ZONE IV, FEET
NAD 83

TEMP. CONSTRUCTION EASEMENT

PERMANENT EASEMENT



PROFILE VIEW

HORIZONTAL SCALE 1" = 100',VERTICAL SCALE 1" = 20'

PRELIMINARY
NOT FOR CONSTRUCTION
JUNE 5 2008
ForeRunner Corporation

SUMMARY

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE	
2	30" O.D. BORE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE	
	AND 40 MILS THICK ABRASION RESISTANT TOP COAT	490.0'

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-007	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	APPR	DATE
P3	ISSUE FOR PERMIT	PJD	6/4/08	CFE		6/4/08
P2	PRELIMINARY	CFE	4/11/08	CFE		4/11/08
P1	PRELIMINARY	MP	1/30/08	CFE		2/8/08

ENGINEERING RECORD

DRAWN	PJD	6/4/08
CHECKED	CFE	6/4/08
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

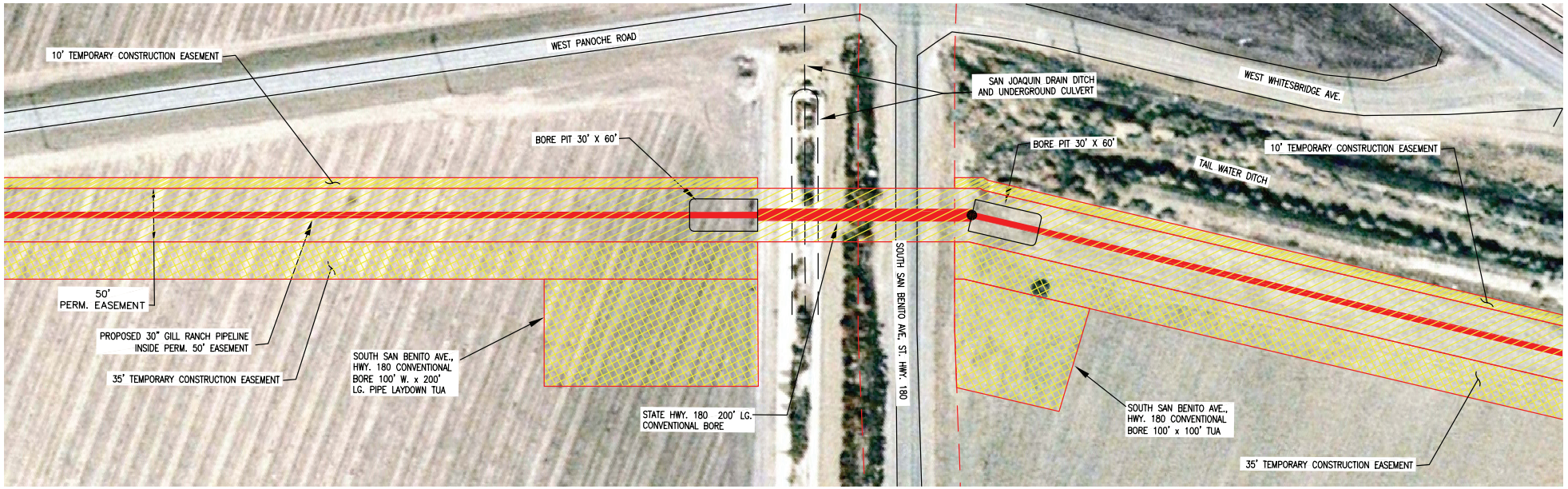
FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
WHITESBRIDGE AVE.
CONVENTIONAL BORE

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV.
AS NOTED	12361C	Madera/Fresno Co., CA	12361-180C-104	P3

Plotted by: MCROWNES Date: 7/7/2008 12:54 PM Drawing: S:\Project Files\NW Natural\Gill Ranch\12361-C Transmission PL\Drawings\Mapping\02. Crossings\12361-180C-104.dwg



PLAN VIEW

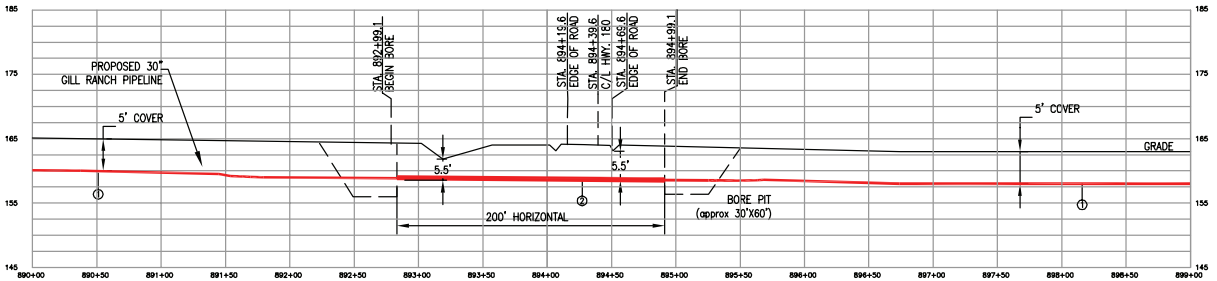
SCALE 1" = 100' HORIZONTAL
REF. ALIGN. DWG.
12361-180C-007

N

SCALE 1"=100'
50 0 50 100 FEET
CA-ZONE IV, FEET
NAD 83

TEMP. CONSTRUCTION EASEMENT

PERMANENT EASEMENT



PROFILE VIEW

HORIZONTAL SCALE 1" = 100',VERTICAL SCALE 1" = 20'

PRELIMINARY
NOT FOR CONSTRUCTION
JUNE 5 2008
ForeRunner Corporation

SUMMARY

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE	
2	30" O.D. BORE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE AND 40 MILS THICK ABRASION RESISTANT TOP COAT	490.0'

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-007	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P3	ISSUE FOR PERMIT	PJD	6/4/08	CFE	6/4/08		
P2	PRELIMINARY	CFE	4/11/08	CFE	4/11/08		
P1	PRELIMINARY	MP	1/30/08	CFE	2/8/08		

ENGINEERING RECORD

DRAWN	PJD	6/4/08
CHECKED	CFE	6/4/08
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

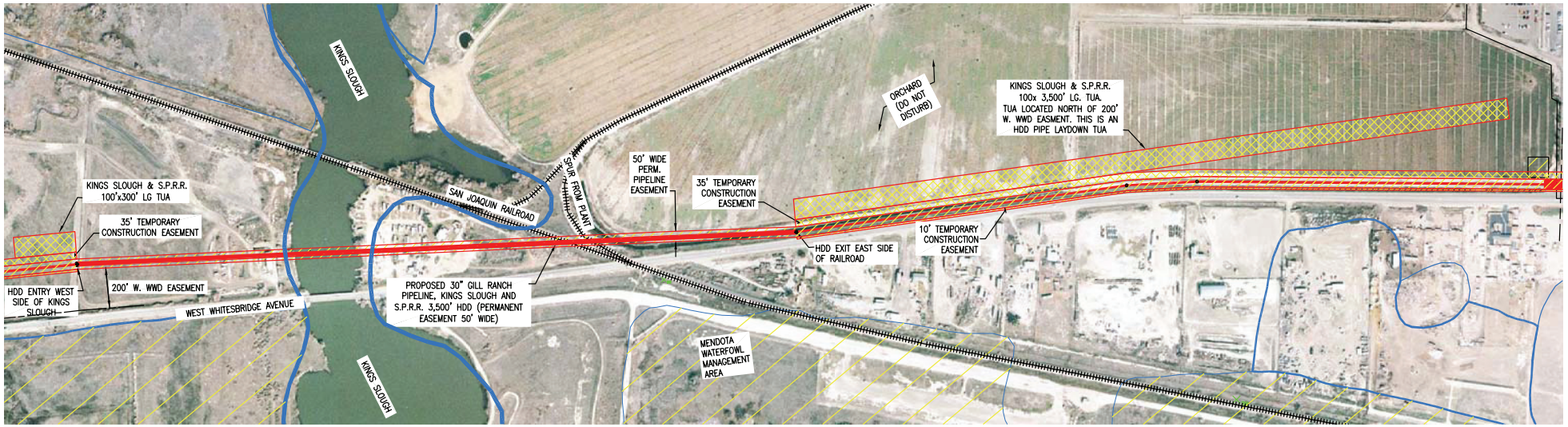
FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
HWY. 180, SO. SAN BENITO AVE
CONVENTIONAL BORE

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV.
AS NOTED	12361C	Madera/Fresno Co., CA	12361-180C-105	P3

Plotted by: MPROWNES Date: 7/7/2008 12:38 PM Drawing: S:\Project Files\NW Natural\Gill Ranch\12361-C Transmission PL\Drawings\Mapping\02. Crossings\12361-180C-105.dwg



PLAN VIEW

SCALE 1" = 200' HORIZONTAL

REF. ALIGN. DWG. 12361-1800-008

N

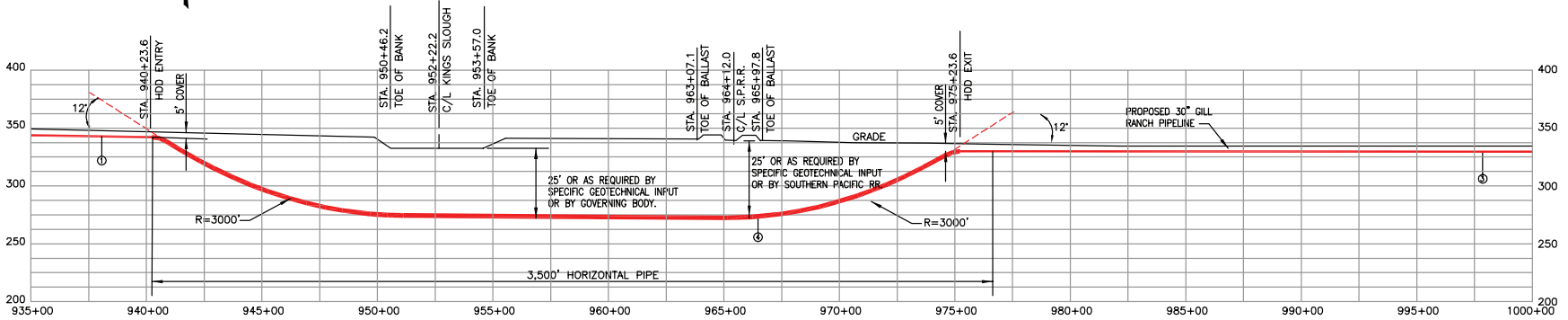
SCALE 1"=200'

200 0 200 400 FEET

CA-ZONE IV, FEET NAD 83

TEMP. CONSTRUCTION EASEMENT

PERMANENT EASEMENT



PROFILE VIEW

HORIZONTAL SCALE 1" = 500', VERTICAL SCALE 1" = 100'

PRELIMINARY NOT FOR CONSTRUCTION
JUNE 5 2008
ForeRunner Corporation

SUMMARY

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.505" W.T., API 5L X70, W/ 14-16 MILS FBE	-
3	30" O.D. BORE PIPE x 0.807" W.T., API 5L X70, W/ 14-16 MILS FBE AND 40 MILS THICK ABRASION RESISTANT TOP COAT	3,500'
4	30" O.D. BORE PIPE x 0.807" W.T., API 5L X70, W/ 14-16 MILS FBE	-

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-1800-008	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P4	ISSUE FOR PERMIT	PJD	6/5/08	CFE	6/5/08		
P3	PRELIMINARY	CFE	4/11/08	CFE	4/11/08		
P2	PRELIMINARY	CMC	2/27/08	CFE	2/27/08		
P1	PRELIMINARY	SL	2/06/08	CFE	2/08/08		

ENGINEERING RECORD

DRAWN	PJD	6/5/08
CHECKED	CFE	6/5/08
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

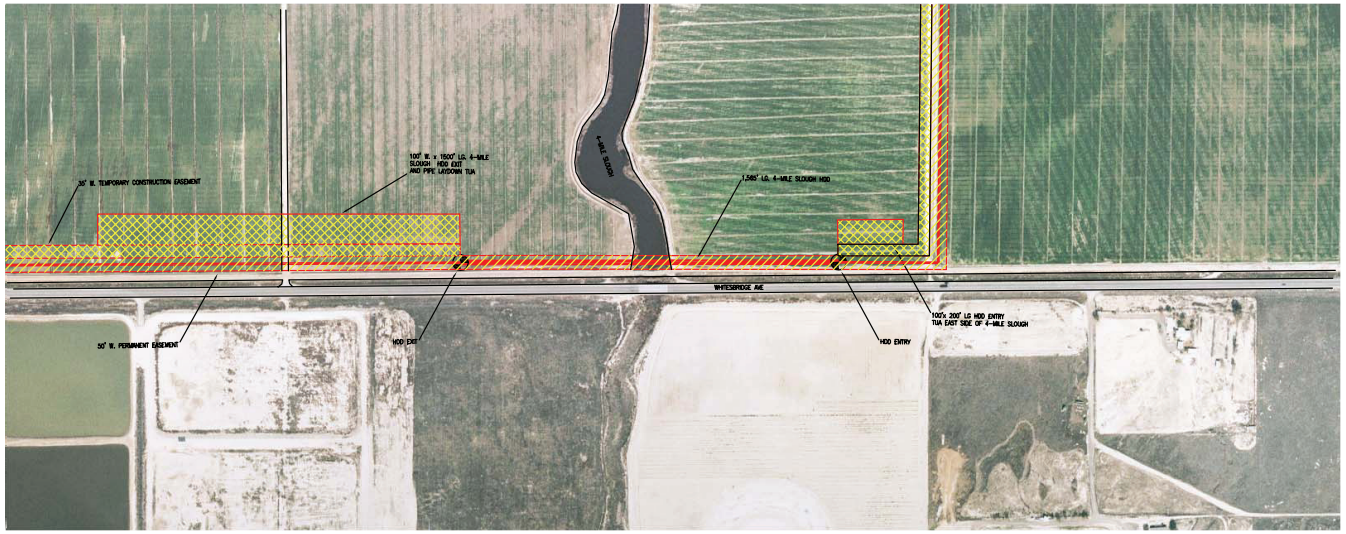
FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
KINGS SLOUGH & S.P.R.R.
HORIZONTAL DIRECTIONAL DRILL

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361C	Madera/Fresno Co., CA	12361-180C-106	P4

Plotted by: MCROWNES Date: 7/7/2008 12:43 PM Drawing: S:\Project Files\NW Natural\Gill Ranch\12361-C Transmission PL\Drawings\Mapping\02. Crossings\12361-180C-106.dwg



PLAN VIEW

SCALE 1" = 200' HORIZONTAL

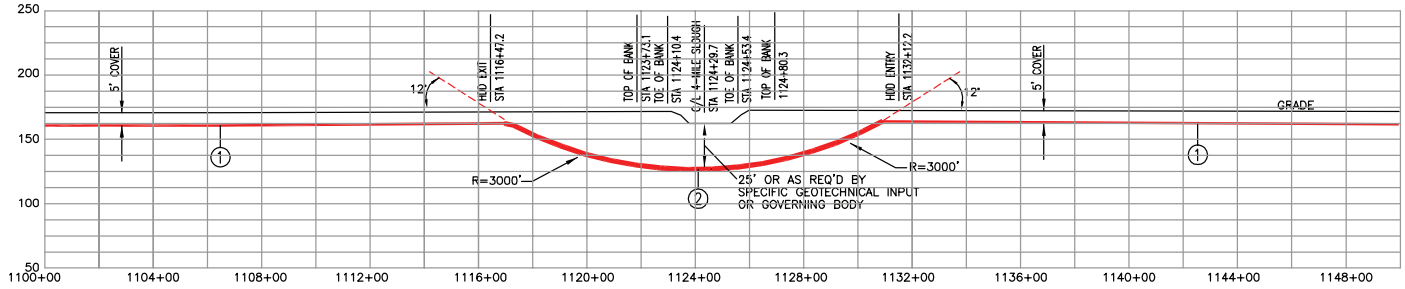
REF. ALIGN. DWG.
12361-180C-011

SCALE 1"=200'
100 0 100 200 FEET
CA-ZONE IV, FEET
NAD 83

N

TEMP. CONSTRUCTION EASEMENT

PERMANENT EASEMENT



PROFILE VIEW

HORIZONTAL SCALE 1" = 200',VERTICAL SCALE 1" = 100'

PRELIMINARY
NOT FOR CONSTRUCTION
APRIL 11 2008
ForeRunner Corporation

SUMMARY

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.505" W.T., API 5L X70, W/ 14-16 MILS FBE	-
2	30" O.D. BORE PIPE x 0.505" W.T., API 5L X70, W/ 14-16 MILS FBE AND 40 MILS THICK ABRASION RESISTANT TOP COAT	1,585'

SUMMARY OF MATERIALS

ITEM	DESCRIPTION	QUANTITY

REFERENCE DRAWINGS

DWG. NO.	TITLE
12361-180C-010	30" PIPELINE ALIGNMENT

REVISIONS

REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P1	PRELIMINARY	CE	4/11/08	CFE	4/11/08		

ENGINEERING RECORD

DRAWN	MP	1/30/08
CHECKED	CFE	2/08/08
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

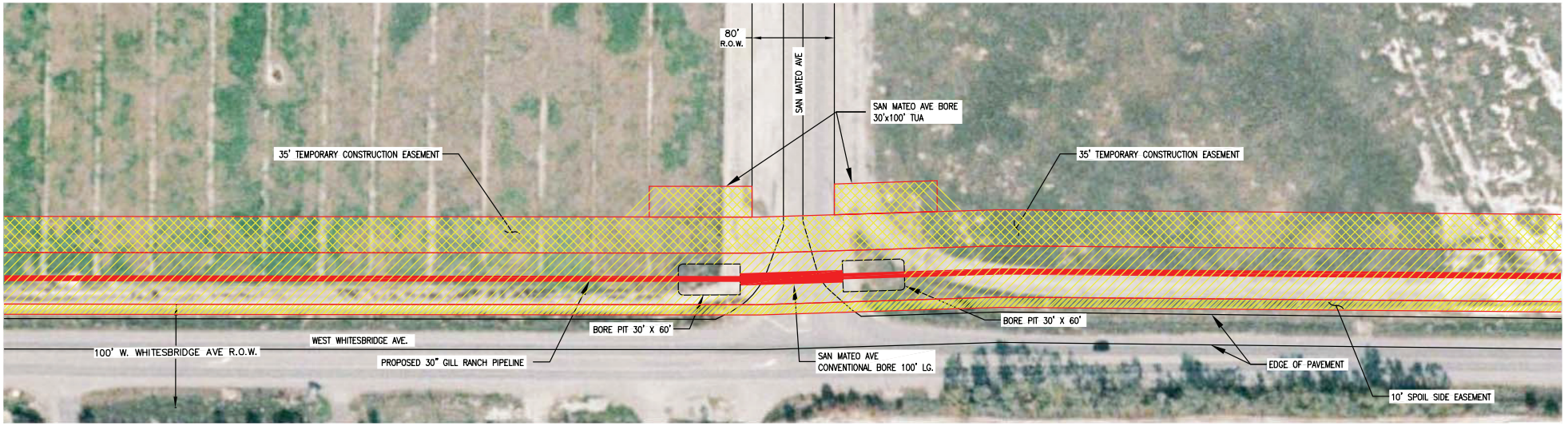
FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
4-MILE SLOUGH
HORIZONTAL DIRECTIONAL DRILL

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361C	Madera/Fresno co., CA	12361-180C-107	P1

Plotted by: KJMONROE Date: 7/7/2008 12:44 PM Drawing: S:\Project Files\WM Natural\Gill Ranch\12361-C Transmission Pl\Drawings\Mapping\02. Crossings\12361-180C-107.dwg



PLAN VIEW

SCALE 1" = 100' HORIZONTAL

REF. ALIGN. DWG.
12361-180C-008

SCALE 1"=100'

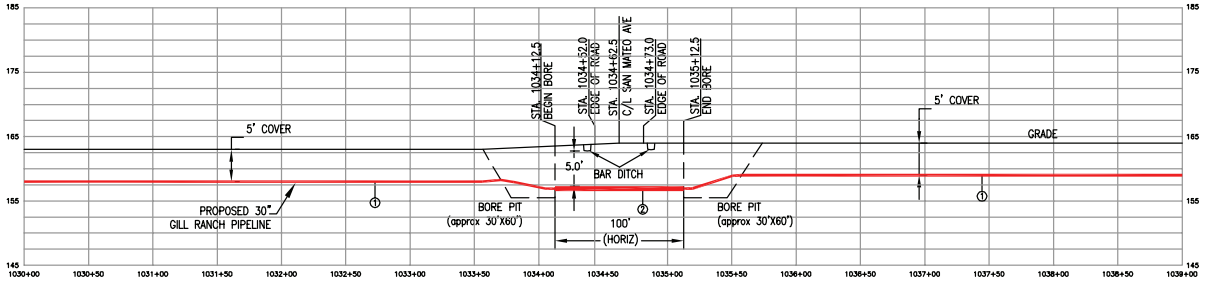
50 0 50 100 FEET

CA-ZONE IV, FEET
NAD 83

N

TEMP. CONSTRUCTION EASEMENT

PERMANENT EASEMENT



PROFILE VIEW

HORIZONTAL SCALE 1" = 100',VERTICAL SCALE 1" = 20'

PRELIMINARY
NOT FOR CONSTRUCTION
April 11 2008
ForeRunner Corporation

SUMMARY

SUMMARY OF MATERIALS					
ITEM	DESCRIPTION	QUANTITY	ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.505" W.T., API 5L X70, W/ 14-16 MILS FBE				
2	30" O.D. BORE PIPE x 0.505" W.T., API 5L X70, W/ 14-16 MILS FBE AND 40 MILS THICK ABRASION RESISTANT TOP COAT	100.0'			

REFERENCE DRAWINGS		
DWG. NO.	TITLE	
12361-180C-008	30" PIPELINE ALIGNMENT	

REVISIONS							
REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P3	PRELIMINARY	CE	4/11/08	CFE	4/11/08		
P2	PRELIMINARY	MP	2/27/08	CFE	2/27/08		
P1	PRELIMINARY	MP	1/30/08	CFE	2/8/08		

ENGINEERING RECORD		
DRAWN	MP	1/30/08
CHECKED	CE	2/8/08
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

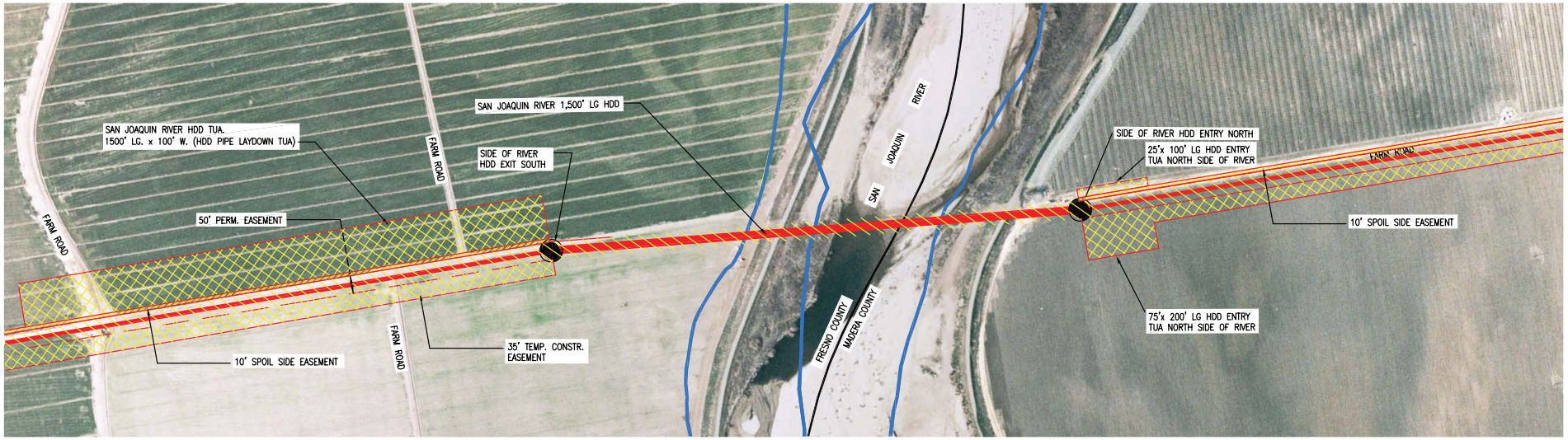
FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
SAN MATEO AVE
CONVENTIONAL BORE

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV.
AS NOTED	12361C	Madera/Fresno co., CA	12361-180C-108	P3

Plotted by: PJORDEY Date: 7/7/2008 12:46 PM Drawing: S:\Project Files\WIP Natural\Gill Ranch\12361-C Transmission P1\Drawings\Mapping\02. Crossings\12361-180C-108.dwg



PLAN VIEW

SCALE 1" = 300' HORIZONTAL

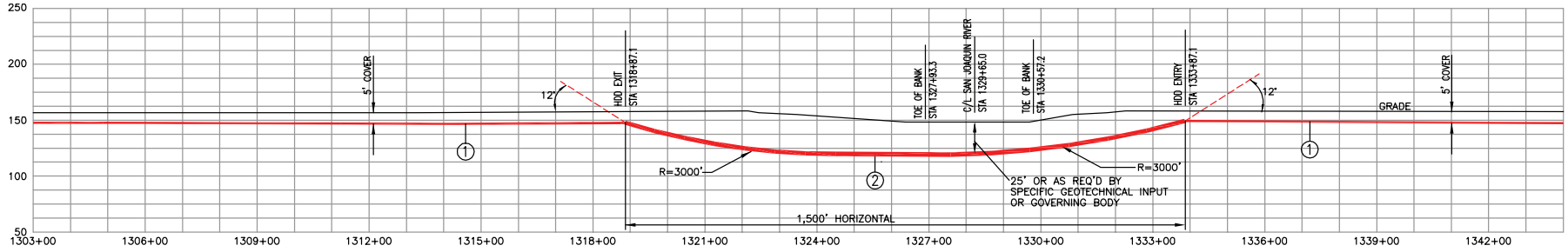
REF. ALIGN. DWG.
12361-180C-011

SCALE 1"=200'
100 0 100 200 FEET
CA-ZONE IV, FEET
NAD 83

N

TEMP. CONSTRUCTION EASEMENT

PERMANENT EASEMENT



PROFILE VIEW

HORIZONTAL SCALE 1" = 300', VERTICAL SCALE 1" = 100'

ISSUE
FOR PERMIT
JUNE 5 2008
ForeRunner Corporation

SUMMARY

SUMMARY OF MATERIALS					
ITEM	DESCRIPTION	QUANTITY	ITEM	DESCRIPTION	QUANTITY
1	30" O.D. LINE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE	-			
2	30" O.D. BORE PIPE x 0.506" W.T., API 5L X70, W/ 14-16 MILS FBE AND 40 MILS THICK ABRASION RESISTANT TOP COAT	1,500'			

REFERENCE DRAWINGS		
DWG. NO.	TITLE	
12361-180C-011	30" PIPELINE ALIGNMENT	

REVISIONS								
REV.	DESCRIPTION	BY	DATE	CHK	DATE	APPR	DATE
P4	ISSUE FOR PERMIT	PJD	6/5/08				
P3	PRELIMINARY	CFE	4/11/08	CE	4/11/08		
P2	PRELIMINARY	CMC	3/27/08	CFE	3/27/08		
P1	PRELIMINARY	SL	2/06/08	CFE	2/08/08		

ENGINEERING RECORD		
DRAWN	PJD	6/16/08
CHECKED		
CLIENT		
PROJECT MGMT.		
PROCESS		
MECHANICAL		
PIPING		
STRUCTURAL		
ELECTRICAL		
I & C		

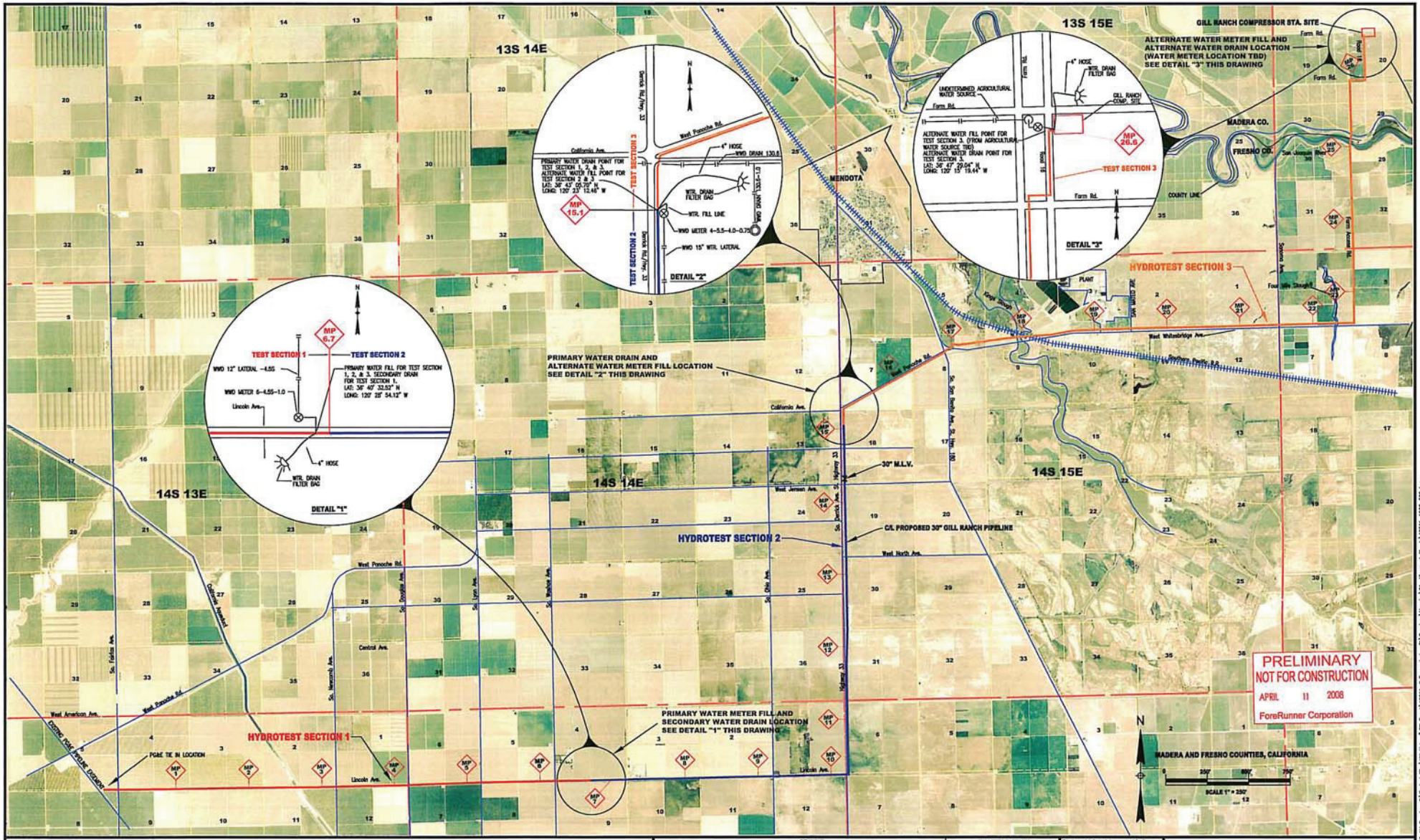
FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH
30" PIPELINE ALIGNMENT
SAN JOAQUIN RIVER
HORIZONTAL DIRECTIONAL DRILL

SCALE	PROJ. NO.	CITY/COUNTY, STATE	DWG. NO.	REV
AS NOTED	12361C	Madera/Fresno Co., CA	12361-180C-109	P4

Plotted by: MCROWNES Date: 7/7/2008 12:48 PM Drawing: S:\Project Files\WM Natural\Gill Ranch\12361-C Transmission PL\Drawings\Mapping\02. Crossings\12361-180C-109.dwg



REVISIONS								ENGINEERING RECORD		
								DRAWN	CFE	2/28/08
								CHECKED	PA	2/28/08
								CLIENT		
								PROJECT MGMT.		
								PROCESS		
								MECHANICAL		
P2	PRELIMINARY	PJD	4/11/08	CFE	4/11/08			PIPING		
P1	PRELIMINARY	PJD	2/18/08	CFE	2/18/08			STRUCTURAL		
REV.	DESCRIPTION	BY	DATE	CHK	DATE	APVD	DATE	ELECTRICAL		
								I & C		

FORERUNNER CORPORATION

GILL RANCH STORAGE

GILL RANCH 30" PIPELINE HYDROTEST SECTIONS, HYDROTEST WATER SUPPLY AND DISCHARGE SITES

SCALE	PROJ. NO.	DRG/SUBMIT. NAME	DWG. NO.	REV
AS SHOWN	12361-B	Madera/Fresno Co., CA	12361-180C-500	P2

Plotted by: CESCH Date: 4/11/2008 10:56 AM Drawing: S:\Project Files\GM Richard\Gill Ranch\12361-C Transmission PS\Drawings\Working\01. Alignment Sheets\12361-180C-500.dwg

APPENDIX A.6

WELL DRILLING DETAILS

Preliminary Drilling Plan

Well drilling for the proposed IW and OM wells requires specialized equipment and procedures. The following information provides preliminary specifications for the well drilling, including a description of the drilling work sequence and equipment layout; rig scheduling and staffing; onsite materials and storage / handling procedures; and drilling rig specifications for a typical rig that will be employed for this work. This drilling plan will be updated after the rig is selected and prior to drilling.

Rig Work Sequence, Specifications, and Equipment Layout. Drilling equipment includes a drill rig, a rotary table, mud motors, drill pipe, rock bits and shale shakers.

The drilling and completion process of an IW well includes the following steps:

- Rig up and set surface casing at a minimum depth of 1,100'.
- Drill conventionally for a vertical well or with directional tools in a deviated to horizontal well, to ~6,400' TVD (true vertical depth).
- Run and set an intermediate casing and cement in place.
- Drill a vertical or deviated hole to a total vertical depth around ~6,500'.
- Run and gravel pack a liner from 100' above the shoe of the intermediate casing to total depth of the well.
- Using a drilling rig or a workover rig run production casing in hole to around 6,400'. Install production tree. Swab well in and clean well. At this time the well is ready for gas injection.

The drilling and completion process of a salt water disposal well entails the following steps:

- Rig up and set surface casing at a minimum depth of 1,100'.
- Drill a straight hole to top of Santa Margarita Formation around 3,200'- 3,500'.
- Run and set an intermediate casing and cement in place.
- Drill a straight hole up to 100' into the formation.
- Run and gravel pack a liner from 100' above the shoe of the intermediate casing to the total depth of the well.

- Using a drilling rig or a workover rig run tubing in hole to top of the liner. Install production tree. Swab well in and clean well.

At this point in the process the well is ready for water injection.

The drilling and completion process of an OM well entails the following steps:

- Rig up and set a surface casing at a minimum depth of 1,100'.
- Drill a straight hole to 6,700'.
- Run casing to bottom and cement the casing.
- Install production tree.
- Perforate well as needed

At this point in the process the well is ready for OM.

Typical drilling rig specifications for these types of wells are attached. The rig will be approximately 174 feet tall. The rig will be onsite for approximately 20 days per well. This unit will be leased on a long-term day rate based contract. At the end of the drilling process it will be removed from the job site.

The rig will be delivered to the site on tractor trailers; approximately 40 truck loads would arrive at the time of set up, with approximately 3-5 additional daily loads to deliver fuel, water, downhole equipment, mud, and supplies. All of this equipment will be removed at the end of the drilling program.

The attached rig specifications describe a typical drilling rig that will be employed for this Project.

Equipment that will be used during the drilling process includes:

- 142' Mast
- 30' substructure
- 2 Mud pumps, mud tank and shale shaker
- Cat walk and Pipe racks
- 4 Baker Tanks and 6 cuttings bins
- 15,000' drill pipe,15,000' casing

- 3 Generators and SCR house
- Logging truck
- Four pick-up trucks
- Vacuum truck
- Fuel and water tanks
- Well control equipment
- Parts House and pipe bins
- 4 Support trailers
- Assorted tools and downhole equipment

Drilling mud materials (in dry form) will to be transported to the well locations. During the drilling operation the drilling materials will be mixed in the designated mud tanks (part of the drilling rig) and used in the well for the purpose of removing the drilling cuttings during rotary drilling and containing the formation pressure. The well control equipment is used to contain any gas pressure that may migrate up through the mud column from the formation.

Use of the drill rig will require minor trenching to install lines for the safety and control equipment. In addition an earthen pit will be dug to store the drilling cuttings and used drilling mud.

Rig Schedule. The use of the rig will commence after GRS receives a CPCN from the CPUC and any other necessary authorizations. Actual time expected on each well is approximately 20 days. The entire drilling project is expected to take approximately six months.

Hours of Drilling Operation and Personnel. The drilling rig will operate 24 hours per day, seven days per week for the duration of drilling. A crew of 13 workers will be onsite. Of the 13, the rig crew (five people) will rotate on 8-hour shifts.

Water Demand and Source. Daily water demand during drilling operations is an estimated 16,000 gallons per day (gpd). Water for drilling will be obtained from an agricultural water well owned by an adjacent agricultural operator. Water will be trucked or temporarily piped and stored in a temporary water tank at the drill site. Bottled drinking water will be provided by the drilling contractor.

Onsite Sanitary Facilities. Portable onsite sanitary facilities will be provided by the drilling contractor. These facilities will be removed at the completion of the drilling.

Onsite Hazardous Materials. Onsite hazardous materials during drilling activities will include:

- 12,300 gallons diesel fuel stored in a temporary tank
- 500 gallons lube oil.

Drilling Waste Handling and Disposal. Drilling waste will consist primarily of drilling cuttings and used mud. The used drilling mud and the drilling cuttings will be collected in an earthen pit next to the drilling rig and will be transported by truck after the drilling operations are completed, to a county permitted disposal site. There are no hazardous chemicals in the proposed drilling mud.

Other Wastes. Other wastes will be generated and hauled off site for disposal or recycling during drilling, including:

- Minor amounts of waste lube oil
- 100 bbl unused or contaminated Sodium Chloride brine
- 50 bbl cement or cement contaminated mud
- Miscellaneous trash, pails, sacks and pallets

Spill Contingency and Emergency Response. GRS will develop a spill and emergency response contingency plan for the Project. The contingency plan will address well upsets (e.g., blowouts).

A separate and parallel spill prevention and countermeasure control plan (SPCC Plan) associated with the drilling program will be included in the final drilling plan. The SPCC Plan will include specific protection measures to contain any spilled fluids onsite. These measures may include sand bag barriers, silt fencing, construction fencing, and restriction of work to pre-developed areas. Equipment staging and maintenance would be performed in a designated location away from vegetated areas or drainages.

Noise and Vibration. Engine/pump noise from the drilling rig is estimated as follows:

- Rig floor: approx. 93 dBa
- At 50-feet elevation: approx. 85 dBa
- At 150 feet elevation: approx. 78 dBa

- Permissible exposure over 8 hours = 85 dBa.

Vibration levels are anticipated to be imperceptible on surrounding properties due to the absorptive characteristics of the sandy loam soils underlying the drill site.

Light and Glare. Night operations will require lighting on the rig floor and certain sections of the rig mast. Lights will be shielded and focused inward on the work location to avoid offsite glare.

Drilling and Production Emissions. The drilling rig prime mover and auxiliary equipment will be powered by portable onsite diesel generators. This portable equipment will be appropriately registered with the California Air Resources Board (CARB) Portable Equipment Registration Program (PERP).

Fire Protection. The drilling rig package will include water storage and fire suppression equipment. A safety manual which addresses fire safety and suppression will be on site.

Site Security. The well drilling is a 24/7 operation. The onsite personnel and supervision will provide security vigilance.

Typical Drill Rig Specifications

Drilling Range:	20,000' with 5" Drillpipe.
Drawworks:	National 1320 UE 2,000 H.P. Driven by (2)-1,000 H.P. General Electric 752 DC Traction Motors With a Baylor 7838 Electric Brake and Electrical Control Panel.
Mast:	DSI 142' High, Rated at 1,200,000# GNC and 1,300,000# Static Hook Capacity.
Substructure:	DSI 30' High With 1,800,000# Capacity.
Mud Pump #1:	National 12-P-160, 6-1/2"x10", 1,600 H.P., Powered by (2)-1,000 H.P. General Electric 752 Traction Motors Charged by (1)6x8 Centrifugal Pump.
Mud Pump #2:	National 12-P-160, 6-1/2"x10", 1,600 H.P., Powered by (2)-1,000 H.P. General Electric 752 Traction Motors Charged by (1)-6x8 Centrifugal Pump.
Rotary Table:	Oilwell 27-½" Independently Powered by (1)-1,000 H.P. General Electric 752 Traction Motor
Traveling System:	Continental Emsco 7 Sheave, 750 Ton Block/BJ Dynaplex 750 ton Hook and Oilwell PC 650 Swivel.
SCR/Power System:	(3)-Detroit Diesel, 16V2000 (1,495 BHP Each) Diesel Engines Driving (3)-Marathon 1,357 KW Generators Ross Hill Electric 3 Bridge SCR Unit and G.E. Electrical Control Unit.
Mud System:	(3)-Pit System, 1,400 Total Barrels, With Shaker, Volume, Mud Cleaning, Suction and Pill Mixing Compartments, (6)-Mud Agitators, and (2)-5x6 Centrifugal Pumps.
Blow Out Prevention Equipment:	Hydril GK 13-5/8", 5,000# Annular, Shaffer 13-5/8", 5,000# D-Ram, Koomey 160 Gallon Accumulator and 5,000# Choke Manifold.
Water/Fuel Storage:	400 BBLS / 21,000 Gallons.
Auxiliary Equipment:	(2)-Air Winches, Wireline Unit (.092"), (2)-Air compressors, Upper &