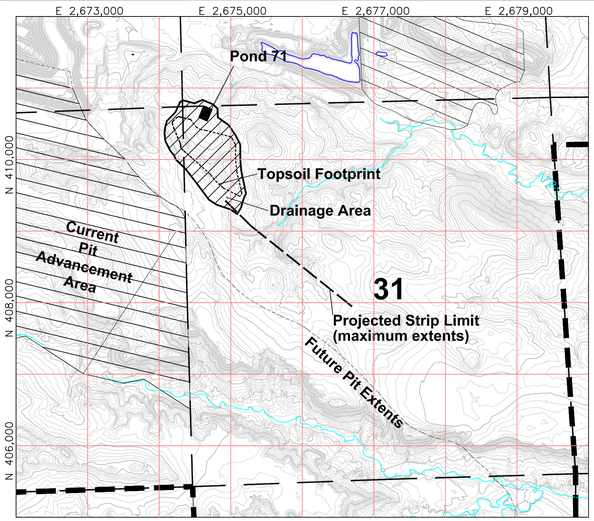


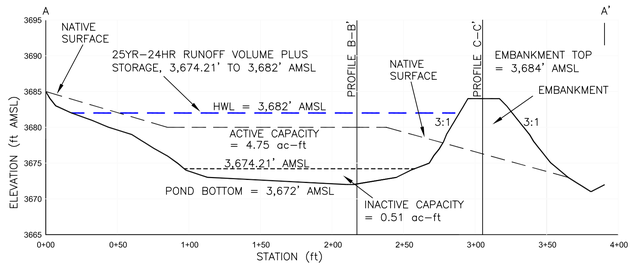
LOCATION MAP

SCALE: 1"=1,000', C.I. =5'

THE POND 71 EMBANKMENT CENTER IS LOCATED AT MINE COORDINATES 410,737 N, 2,674,738 E. THE POND IS LOCATED PRIMARILY IN THE NW ¼ OF THE NW ¼ OF SECTION 31, T40E, R8S.

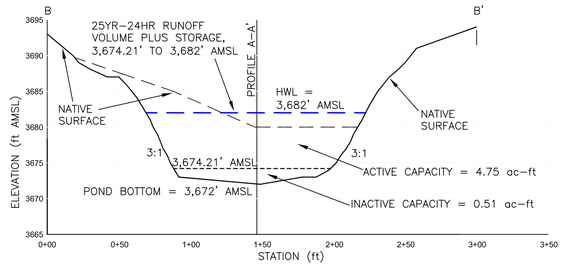
POND 71 REQUIRED CAPACITY

SEDIMENT CAPACITY (0.02 ac-ft per acre)	=	0.51 ac-ft
25YR-24HR RUNOFF VOLUME	=	2.88 ac-ft
TOTAL REQUIRED CAPACITY	=	3.39 ac-ft



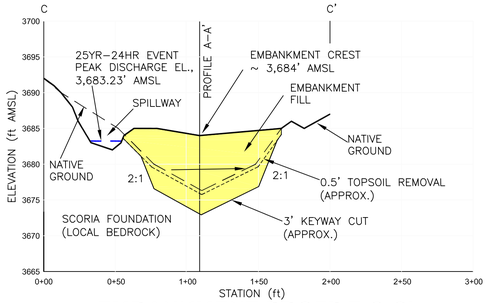
POND PROFILE A-A'

SCALE: H: 1"=50', V: 1"=10'



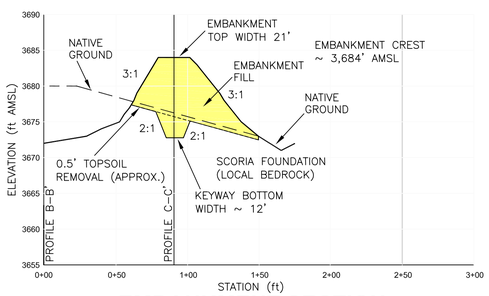
POND PROFILE B-B'

SCALE: H: 1"=50', V: 1"=10'



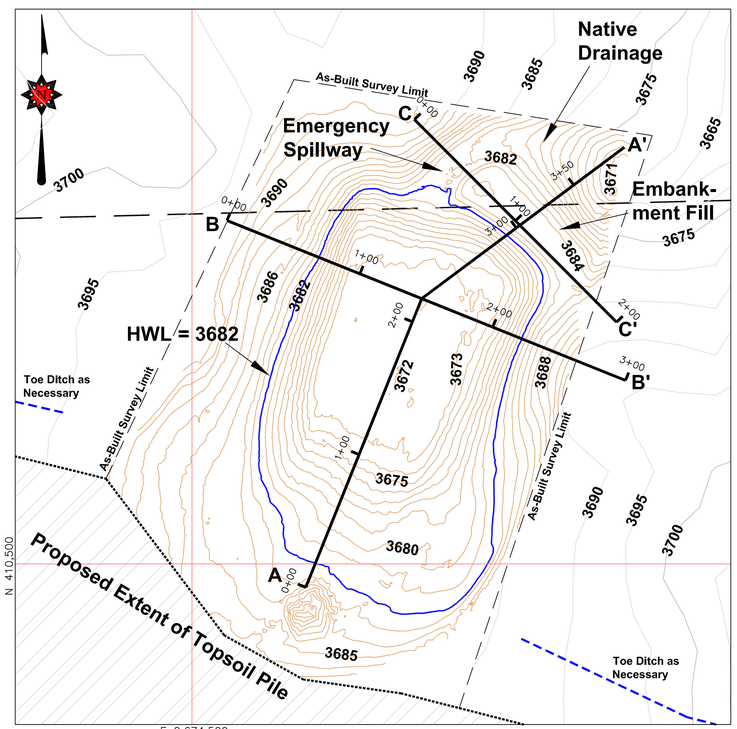
EMBANKMENT PROFILE C-C'

SCALE: H: 1"=50', V: 1"=10'



EMBANKMENT SECTION

SCALE: H: 1"=50', V: 1"=10'



POND 71 PLAN VIEW

SCALE: 1"=50'

October 2013 Aerial Survey C.I. = 5'

January 2014 As-Built Survey C.I. = 1'

POND 71 DRAINAGE AREA DATA

DRAINAGE AREA	=	25.5 acres
LONGEST WATERCOURSE	=	2,485 ft.
RUNOFF CURVE NUMBER	=	90
BASIN RELIEF	=	100 ft.
SOILS	=	HYDROLOGIC SOILS GROUP C
VEGETATION	=	STRIPPED AND TOPSOIL STOCKPILE

RUNOFF ESTIMATES TO POND 71

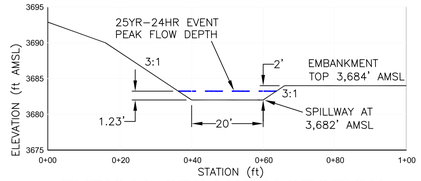
RAINFALL DISTRIBUTION	=	SCS TYPE II
PRECIPITATION (10yr-24hr)	=	2.19 in.
PEAK Q (10yr.-24hr.)	=	30.79 cfs
VOLUME (10yr.-24hr.)	=	2.17 ac.-ft.
PRECIPITATION (25yr-24hr)	=	2.65 in.
PEAK Q (25yr.-24hr.)	=	40.66 cfs
VOLUME (25yr.-24hr.)	=	2.88 ac.-ft.
DESIGN METHOD	=	SCS RUNOFF CURVE # METHOD & SCS TRIANGULAR HYDROGRAPH METHOD -SEDCAD4

INLET DETAILS

RUNOFF INFLOW WILL BE DIRECTED TOWARD THE POND VIA TOPSOIL PILE TOE DITCHES AS NECESSARY. FLOWS ENTERING THE POND FROM THE TOPSOIL PILE GENERALLY CONSIST OF OVERLAND FLOW. UPSTREAM OF, AND WITHIN, THE POND INTERIOR SLOPES THESE FLOWS PASS OVER SCORIA BEDROCK MATERIAL AT LAND SURFACE WHICH PROVIDES FOR EROSION CONTROL AND POND STABILITY.

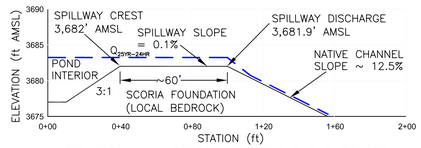
SPILLWAY HYDRAULICS

BOTTOM WIDTH	=	20 feet
SIDE SLOPES	=	3:1
10YR-24HR PEAK FLOW	=	30.79 cfs
10YR-24HR PEAK FLOW DEPTH	=	1.05 feet
25YR-24HR PEAK FLOW	=	40.66 cfs
25YR-24HR PEAK FLOW DEPTH	=	1.23 feet
CHANNEL SLOPE	=	0.1%
25YR-24HR MIN. FREEBOARD	=	0.77 feet



TYPICAL SPILLWAY SECTION

SCALE: H: 1"=20', V: 1"=10'



TYPICAL SPILLWAY PROFILE

SCALE: H: 1"=40', V: 1"=10'

CERTIFICATE OF ENGINEER

I, Bruce N. Nelson of Sheridan, Wyoming, hereby certify that this map and drawings were prepared by myself or under my direct supervision using topographic base maps prepared for Spring Creek Mine LLC dated 10/13, and field surveys dated 01/15, and that they correctly represent the facilities and conditions described in the accompanying application.

BRUCE N. NELSON, P.E. No. 8663 E

AREA-ELEVATION-CAPACITY TABLE

ELEVATION FT. AMSL	AREA ACRES	INCREMENTAL CAPACITY ACRE-FEET	CUMULATIVE CAPACITY ACRE-FEET	USE
3,672.0	0.00		0.00	**INACTIVE CAPACITY** VOLUME = 0.51 AC.-FT.
		0.13		
3,673.0	0.26		0.13	
		0.18		
3,673.6	0.31		0.31	
		0.12		sediment storage
3,674.0	0.35		0.43	
		0.08		
3,674.21	0.36		0.51	
		0.30		**ACTIVE CAPACITY** 4.75 AC.-FT.
3,675.0	0.41		0.81	
		0.43		
3,676.0	0.46		1.24	25YR.-24HR. RUNOFF VOLUME = 2.88 AC.-FT.
		0.49		
3,677.0	0.51		1.73	ADDITIONAL STORAGE VOLUME = 1.87 AC.-FT.
		0.54		
3,678.0	0.57		2.27	
		0.60		
3,679.0	0.64		2.87	
		0.69		
3,680.0	0.74		3.56	
		0.79		
3,681.0	0.85		4.35	
		0.91		
3,682.0	0.97		5.26	

HIGH WATER LEVEL = 3,682 FT. AMSL, TOTAL CAPACITY = 5.26 AC.-FT.

POND 71 WAS INITIALLY DESIGNED TO BE CONSTRUCTED FULLY INCISED, HOWEVER, DURING CONSTRUCTION THE SCORIA BEDROCK WAS FOUND TO BE TOO NEAR THE SURFACE AND TOO CONSOLIDATED TO ALLOW EXCAVATION OF THE REQUIRED CAPACITY USING THE INCISED APPROACH. CONSTRUCTION PROCEEDED USING AN EMBANKMENT TO OBTAIN SUFFICIENT CAPACITY. INITIAL DESIGN DID NOT SPECIFY SPILLWAY CRITERIA AS THE POND OVERFLOW WAS ANTICIPATED TO BE TO THE NATIVE CHANNEL AT THE LOW POINT OF THE INCISED CUT. USE OF AN EMBANKMENT NECESSITATED THAT A SPILLWAY BE CONSTRUCTED. THE SPILLWAY WAS CONSTRUCTED TO ALLOW CONVEYANCE OF THE 25 YEAR 24 HOUR RUNOFF EVENT PEAK FLOW.

NOTES:

POND 71 RECEIVES SURFACE RUNOFF WATER FROM PIT STRIPPING AND THE TOPSOIL PILE DRAINAGE AREA AS SHOWN. THE POND OUTLET (AS NEEDED) IS VIA THE EMERGENCY SPILLWAY AT THE NORTHWEST END OF THE POND EMBANKMENT, AT MINE COORDINATES 410,756 N AND 2,674,658 E, APPROXIMATELY 338 FEET NORTHEAST OF THE NORTHWEST CORNER OF SECTION 31.

POND 71 HAS BEEN CONSTRUCTED BY PLACING EMBANKMENT FILL ACROSS THE DRAINAGE AND EXCAVATING THE DRAINAGE SIDES AND BOTTOM UPSTREAM OF THE EMBANKMENT LOCATION AS SHOWN, WITHIN NATIVE TOPOGRAPHY NORTH OF PIT STRIPPING. THE POND BOTTOM WAS EXCAVATED TO AN ELEVATION OF 3,672 FEET AMSL. THE EMBANKMENT CREST WAS CONSTRUCTED TO A MAXIMUM HEIGHT OF 6.7 FEET FROM THE UPSTREAM EMBANKMENT TOE. THE APPROXIMATE EXCAVATION REQUIRED TO COMPLETE THE POND WAS 3,500 BANK CUBIC YARDS. THE APPROXIMATE AMOUNT OF FILL REQUIRED TO CONSTRUCT THE POND 71 EMBANKMENT WAS 1,350 LOOSE CUBIC YARDS.

THE POND WILL BE OPERATED WITH AN INACTIVE CAPACITY OF 0.51 AC-FT. THE INACTIVE CAPACITY WILL BE USED FOR STORAGE OF A SEDIMENT VOLUME EQUAL TO 0.02 AC-FT FOR EACH ACRE OF DISTURBANCE WITHIN THE POND DRAINAGE AREA. THE 25YR-24HR STORM EVENT RUNOFF IS MODELED TO BE 2.88 AC-FT. THE REQUIRED CAPACITY OF THE RESERVOIR IS 3.39 AC-FT. THE AS-BUILT CAPACITY OF THE RESERVOIR IS 5.26 AC-FT. ACTIVE CAPACITY WILL BE USED TO CONTAIN AND MANAGE UP TO THE 25YR-24HR STORM EVENT RUNOFF WATER VOLUME PLUS 1.87 AC-FT OF PRE OR POST EVENT RUNOFF STORAGE.

WHERE EXCAVATED, THE POND 71 INTERIOR SIDE SLOPES ARE AT MINIMUM 3:1 TO DAYLIGHT WITH NATIVE SLOPES. THE EMBANKMENT HAS 3:1 SLOPES ON BOTH UPSTREAM AND DOWNSTREAM FACES.

THE PRIMARY POND INLETS WHERE TOPSOIL PILE TOE DITCHES DISCHARGE TO THE SOUTH PORTION OF THE POND, ARE PROTECTED BY THE NATIVE SCORIA POND BASE INTO WHICH THE POND IS EXCAVATED. WHILE RIPRAP PROTECTION WAS SUGGESTED IN THE POND DESIGN, THE SHALLOW AND SUBSTANTIAL NATURE OF THE IN-SITU SCORIA AT THE SITE REMOVES THE NEED FOR INLET EROSION PROTECTION.

TOPSOIL WAS REMOVED BELOW THE EMBANKMENT FILL PLACEMENT TO A DEPTH OF 0.5 FEET (MAXIMUM DEPTH TO SCORIA BEDROCK). THE EMBANKMENT KEYWAY WITH A BASE WIDTH OF 12 FEET WAS CUT 2.5 FEET INTO THE SCORIA BEDROCK. EMBANKMENT FILL MATERIALS CONSIST OF SILTY-CLAY SOIL, OBTAINED FROM PIT OVERBURDEN MATERIALS, AND FREE OF ROCKS AND GRAVELS. EMBANKMENT FILL WAS PLACED IN 8 INCH LIFTS FROM THE BASE OF THE KEYWAY TO THE CREST ELEVATION. THE FILL WAS MACHINE COMPACTED USING SCRAPERS AND A D6 BULLDOZER.

THE POND 71 EMERGENCY SPILLWAY WAS CUT AT A 0.1% GRADE ENTIRELY WITHIN SCORIA BEDROCK FROM THE SPILLWAY INLET TO DISCHARGE IN THE NATIVE DRAINAGE NORTH OF THE EMBANKMENT. SUBSTANTIAL SCORIA WITHIN THE SPILLWAY CHANNEL NEGATES NEED FOR EROSION PROTECTION MEASURES. FOLLOWING CONSTRUCTION THE EMBANKMENT, AND SPILLWAY WHERE TOPSOIL IS PRESENT, WAS SEEDED TO ESTABLISH VEGETATIVE COVER FOR PROTECTION AND STABILITY.

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PHONE: (406) 757-2581

DATE	BY	REVISION

Sediment Control Pond 71 As-Built

DESIGN RWH DRAWN RWH DATE 01/21/15 SHEET 1 OF 1
SCALE as shown CONTOUR INTERVAL as shown FILE NUMBER SP-71 Pond.dwg