RECLAMATION PLAN
for the
COTTONWOOD SAND MINING PROJECT
PDS2018-MUP-18-003, PDS2018-RP-18-001, PDS2018-ER-18-19-007
JAMACHA, CA

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GENERAL CONSIDERATIONS

Authority	Requirements/Practices/Standards	✓ or N/A
PRC 2772(b)	Required contents chart: A chart identifying the location (e.g., page number, chapter, appendix, or other location in the reclamation plan) of content that meets the requirements of PRC Sections 2772, 2773, 2773.3 and CCR Articles 1 and 9 (as delineated in this checklist).	✓
PRC 2772(c)(1)	Contact information: Name and address of the surface mining operator and any person designated by the operator as an agent for service of process	✓
PRC 2772(c)(2)	Material quantity and type: The anticipated total quantity and type of minerals to be mined (see Annual Report Instructions, Exhibit B, for mineral types and units of measure).	✓
PRC 2772(c)(3)	Dates: The initiation and termination dates of mining.	✓
PRC 2772(c)(4)	Depth of mining: The maximum anticipated depth of the surface mining operation.	✓
PRC 2772(c)(5) (A-F)	Reclamation plan maps shall include**:** Size and legal description of lands affected by surface mining operations;	✓
	Names and addresses of owners of all surface interests and mineral interests;	✓
	Property lines, setbacks, and the reclamation plan boundary;	✓
	Existing and final topography with contour lines at appropriate intervals;	✓
	Detailed geologic description of the area of the surface mining operation;	✓
	Locations of railroads, utility features, and roads (access roads, temporary roads to be reclaimed, and any roads remaining for the end use).	✓
	All maps, diagrams, or calculations that are required to be prepared by a California-licensed professional shall include the preparer's name, license number, signature & seal.	✓
PRC 2772(c)(6)	Mining method and schedule: A description of the mining methods.	✓
PRC 2772(c)(7)	Subsequent use(s): A description of the proposed subsequent use(s) after reclamation.	✓
	Evidence that all landowners have been notified of the proposed use.	✓
PRC 2772(c)(9)	Impact on future mining: A statement regarding the impact of reclamation on future mining on the site.	✓
PRC 2772(c)(10)	Signed statement: Statement signed by the operator accepting responsibility for reclamation of the mined lands per the reclamation plan.	✓
PRC 2776(b-c)	Pre-SMARA areas: Reclamation plans shall apply to operations conducted after January 1, 1976, or to be conducted in the future. Mined lands disturbed prior to January 1, 1976, and not disturbed after that date may be excluded from the reclamation plan.	✓

CCR 3502(b)(2)	Public health and safety: A description of how any potential public health and safety concerns that may arise due to exposure of the public to the site will be addressed.	✓
CCR 3709(a)	Equipment storage and waste disposal: Designate areas for equipment storage and show on maps.	✓
CCR 3709(a) CCR 3709(b)	All waste shall be disposed of in accordance with state and local health and safety ordinances.	✓
	Structures and equipment removed: Structures and equipment should be dismantled and removed at closure, except as demonstrated to be necessary for the proposed end use.	✓
CCR 3713(a)	Well closures: Drill holes, water wells, monitoring wells will be completed or abandoned in accordance with laws, unless demonstrated necessary for the proposed end use.	✓
CCR 3713(b)	Underground openings: Any portals, shafts, tunnels, or openings will be gated or protected from public entry, and to preserve access for wildlife (e.g., bats).	✓

GEOLOGY AND GEOTECHNICAL

Authority	**Requirements/Practices/Standards**	✓ or N/A
PRC 2772(c)(5)	A description of the general geology of the area	✓
	A detailed description of the geology of the mine site.	✓
PRC 2773.3	If a metallic mine is located on, or within one mile of, any "Native American sacred site" and is located in an "area of special concern," the reclamation plan shall require that all excavations and/or excess materials be backfilled and graded to achieve the approximate original contours of the mined lands prior to mining.	N/A
CCR 3502(b)(4)	The source and disposition of fill materials used for backfilling or grading shall be considered in the reclamation plan.	✓
CCR 3502(b)(3)	The designed steepness and treatment of final slopes must consider the physical properties of slope materials, maximum water content, and landscaping.	✓
	The reclamation plan shall specify slope angles flatter than the critical gradient for the type of slope materials.	✓
	When final slopes approach the critical gradient, a Slope Stability Analysis will be required.	✓
CCR 3704.1	Backfilling required for surface mining operations for metallic minerals.	N/A
CCR 3704(a)	For urban use, fill shall be compacted in accordance with Uniform Building Code, local grading ordinance, or other methods approved by the lead agency.	✓
CCR 3704(b)	For resource conservation, compact to the standards required for that end use.	✓
CCR 3704(d)	Final reclamation fill slopes shall not exceed 2:1 (H:V), except when allowed by site-specific engineering analysis, and the proposed final slope can be successfully revegetated. See also Item 3502(b)(3).	✓
CCR 3704(e)	At closure, all fill slopes shall conform with the surrounding topography or approved end use.	✓

CCR 3704(f)	Final cut slopes must have a minimum slope stability factor of safety that is suitable for the end use and conforms with the surrounding topography or end use.	✓

HYDROLOGY AND WATER QUALITY

Authority	Requirements/Practices/Standards	✓ or N/A
PRC 2770.5	For operations within the 100-year flood plain (defined by FEMA) and within one mile up- or downstream of a state highway bridge, Caltrans must be notified and provided a 45-day review period by the lead agency.	✓
PRC 2772(c)(8)(A)	Description of the manner in which contaminants will be controlled and mine waste will be disposed.	✓
PRC 2772(c)(8)(B)	The reclamation plan shall include a description of the manner in which stream banks/beds will be rehabilitated to minimize erosion and sedimentation.	✓
PRC 2773(a)	The reclamation plan shall establish site-specific sediment and erosion control criteria for monitoring compliance with the reclamation plan.	✓
CCR 3502(b)(6)	Temporary stream and watershed diversions shall be detailed in the reclamation plan.	✓
CCR 3503(a)(2)	Stockpiles of overburden and minerals shall be managed to minimize water and wind erosion.	✓
CCR 3503(b)(2)	Operations shall be conducted to substantially prevent siltation of groundwater recharge areas.	✓
CCR 3503(a)(3)	Erosion control facilities shall be constructed and maintained where necessary to control erosion.	✓
CCR 3503(b)(1)	Settling ponds shall be constructed where they will provide a significant benefit to water quality.	✓
CCR 3503(d)	Disposal of mine waste and overburden shall be stable and shall not restrict natural drainage without suitable provisions for diversion.	✓
CCR 3503(e)	Grading and revegetation shall be designed to minimize erosion and convey surface runoff to natural drainage courses or interior basins.	✓
	Spillway protection shall be designed to prevent erosion.	✓
CCR 3706(a)	Surface mining and reclamation activities shall be conducted to protect on-site and downstream beneficial uses of water.	✓
CCR 3706(b)	Water quality, recharge potential, and groundwater storage that is accessed by others shall not be diminished.	✓
CCR 3706(c)	Erosion and sedimentation shall be controlled during all phases of construction, operation, reclamation, and closure of surface mining operations to minimize siltation of lakes and water courses as per RWQCB/SWRCB.	✓
CCR 3706(d)	Surface runoff and drainage shall be controlled to protect surrounding land and water resources.	✓
	Erosion control methods shall be designed for not less than 20 year/1 hour intensity storm event.	✓
CCR 3706(e)	Impacted drainages shall not cause increased erosion or sedimentation. Mitigation alternatives shall be proposed in the reclamation plan.	✓

CCR 3706(f)(1)	Stream diversions shall be constructed in accordance with the Lake and Streambed Alteration Agreement (LSAA) between the operator and the Department of Fish and Wildlife.	N/A
CCR 3706(f)(2)	Stream diversions shall also be constructed in accordance with Federal Clean Water Act and the Rivers and Harbors Act of 1899.	N/A
CCR 3706(g)	All temporary stream diversions shall eventually be removed, and the affected land reclaimed.	N/A
CCR 3710(a)	Surface and groundwater shall be protected from siltation and pollutants in accordance with the Porter-Cologne Act, the Federal Clean Water Act, and RWQCB/SWRCB requirements.	✓
CCR 3710(b)	In-stream mining shall be conducted in accordance with Section 1600 et seq. of the California Fish and Game Code, Section 404 of the Clean Water Act, and Section 10 of the Rivers and Harbors Act of 1899.	✓
CCR 3710(c)	In-stream mining shall be regulated to prevent impacts to structures, habitats, riparian vegetation, groundwater levels, and banks.	✓
	In-stream channel elevations and bank erosion shall be evaluated annually using extraction quantities, cross-sections, and aerial photos.	✓
CCR 3712	Mine waste and tailings and mine waste disposal units are governed by SWRCB waste disposal regulations and shall be reclaimed in accordance with this article: CCR Article 1. Surface Mining and Reclamation Practice. Section 3500 et seq.	✓

SENSITIVE SPECIES AND HABITAT

Authority	Requirements/Practices/Standards	✓ or N/A
CCR 3502(b)(1)	A description of the environmental setting (identify sensitive species, wildlife habitat, sensitive natural communities, e.g., wetlands).	✓
	Impacts of reclamation on surrounding land uses.	✓
CCR 3503(c)	Fish and wildlife habitat shall be protected by all reasonable measures.	✓
CCR 3703(a)	Sensitive species shall be conserved or mitigated as prescribed by the federal and California Endangered Species Acts.	✓
CCR 3703(b)	Wildlife habitat shall be established on disturbed land at least as good as pre-project, unless end use precludes its use as wildlife habitat.	✓
CCR 3703(c)	Wetlands shall be avoided or mitigated at 1:1 minimum for both acreage and habitat value.	✓
CCR 3704(g)	Piles or dumps shall not be placed in wetlands without mitigation.	✓
CCR 3710(d)	In-stream mining shall not cause fish to be trapped in pools or off-channel pits or restrict migratory or spawning activities.	N/A

TOPSOIL

Authority	Requirements/Practices/Standards	✓ or N/A
CCR 3503(a)(1)	Removal of vegetation and overburden preceding mining shall be kept to a minimum.	✓

CCR 3503(f)	When the reclamation plan calls for resoiling, mine waste shall be leveled and covered with a layer of finer material. A soil layer shall then be placed on this prepared surface.	✓
	The use of soil conditioners, mulches, or imported topsoil shall be considered where such measures appear necessary.	✓
CCR 3704(c)	Mine waste shall be stockpiled to facilitate phased reclamation and kept separate from topsoil or other growth media.	✓
CCR 3705(e)	If soil is altered or other than native topsoil, soil analysis is required. Add fertilizers or soil amendments if necessary.	✓
CCR 3711(a)	All salvageable topsoil shall be removed as a separate layer.	✓
	Topsoil and vegetation removal should not precede mining by more than one year.	✓
CCR 3711(b)	Topsoil resources shall be mapped prior to stripping and location of topsoil stockpiles shown on map included in the reclamation plan.	✓
	Topsoil and other growth media shall be maintained in separate stockpiles.	✓
	Test plots may be required to determine the suitability of growth media for revegetation purposes.	✓
CCR 3711(c)	Soil salvage operations and phases of reclamation shall be set forth in the reclamation plan to minimize the area disturbed and to achieve maximum revegetation success.	✓
CCR 3711(d)	Topsoil and growth media shall be used to phase reclamation as soon as can be accommodated following the mining of an area.	✓
	Topsoil stockpiles shall not be disturbed until needed for reclamation	✓
	Topsoil stockpiles shall be clearly identified.	✓
	Topsoil shall be planted with vegetation or otherwise protected to prevent erosion and discourage weeds.	✓
CCR 3711(e)	Topsoil shall be redistributed in a manner resulting in a stable, uniform thickness consistent with the end uses.	✓

REVEGETATION

Authority	**Requirements/Practices/Standards**	✓ or N/A
PRC 2773(a)	The reclamation plan shall be specific to the property and shall establish site-specific criteria for evaluating compliance with the reclamation plan with respect to revegetation.	✓
CCR 3503(g)	Available research regarding revegetation methods and selection of species given the topography, resoiling characteristics, and climate of the mined areas shall be used.	✓
CCR 3705(a)	Baseline studies shall be conducted prior to mining activities to document vegetative cover, density, and species richness.	✓
	Vegetative cover shall be similar to surrounding habitats and self-sustaining.	✓
CCR 3705(b)	Test plots shall be conducted simultaneously with mining to ensure successful implementation of the proposed revegetation plan	✓
CCR 3705(c)	Decompaction methods, such as ripping and disking, shall be used in areas to be revegetated to establish a suitable root zone for planting.	✓
CCR 3705(d)	Roads shall be stripped of road base materials, resoiled, and revegetated, unless exempted.	✓

CCR 3705(f)	Temporary access shall not disrupt the soil surface on arid lands except where necessary for safe access. Barriers shall be installed to keep unauthorized vehicles out	✓
CCR 3705(g)	Use local native plant species (unless non-native species meet the end use).	✓
	Areas to be developed for industrial, commercial, or residential shall be revegetated for the interim period to control erosion.	N/A
CCR 3705(h)	Planting shall be conducted during the most favorable period of the year for plant establishment.	✓
CCR 3705(i)	Use soil stabilizing practices and irrigation when necessary to establish vegetation.	✓
CCR 3705(j)	If irrigation is used, demonstrate that revegetation has been self-sustaining without irrigation for two years prior to the release of financial assurance.	✓
CCR 3705(k)	Noxious weeds shall be monitored and managed.	✓
CCR 3705(l)	Plant protection measures such as fencing, and caging shall be used where needed for revegetation success. Protection measures shall be maintained until revegetation efforts are successfully completed and the lead agency authorizes removal.	✓
CCR3705(m)	Quantitative success standards for vegetative cover, density, and species richness shall be included in the reclamation plan.	✓
	Monitoring to occur until success standards have been achieved.	✓
	Sampling techniques for measuring success shall be specified. Sample size must be sufficient to provide at least an 80 percent statistical confidence level.	✓

AGRICULTURE

Authority	**Requirements/Practices/Standards**	✓ or N/A
CCR 3707(a)	Where the end use will be agriculture, prime agricultural land shall be returned to a fertility level specified in the reclamation plan.	N/A
CCR 3707(b)	Segregate and replace topsoil in proper sequence by horizon in prime agricultural soils.	N/A
CCR 3707(c)	Post reclamation productivity rates for prime agricultural land must be equal to pre-project condition or to a similar site for two consecutive years.	N/A
	Productivity rates shall be specified in the reclamation plan.	N/A
CCR 3707(d)	If fertilizers and amendments are applied, they shall not cause contamination of surface or groundwater.	N/A
CCR 3708	For sites where the end use is to be agricultural, non-prime agricultural land must be reclaimed to be capable of sustaining economically viable crops common to the area.	N/A

SMARA Index

Content Requirement	Location Reference	
	Section/ Appendix	Page(s) No.
PRC 2772 (c)		
Operator Name and address.	Section 2.1	13
Names and addresses of persons designated as an agent for the service of process.	Section 2.1	14
Quantity and type of minerals to be mined.	Section 2.1	14
Proposed dates of mine initiation and termination.	Section 2.1	14
Maximum anticipated depth of the surface mining.	Section 2.1	14
Reclamation Plan map(s) with appropriate information.	Attached	Attachment A
A description of and plan for the type of surface mining to be employed.	Section 2.2	14
Time schedule that provides for the completion of surface mining on each segment of the mined lands so that reclamation can be initiated at the earliest possible time on portions of the mined lands not subject to further disturbance by mining.	Section 2.2, Section 2.4 & Table 2.	14, 15 & 22
Proposed use or potential uses of the mined lands.	Section 2.3	15
Evidence that all owners of a possessory interest in the land have been notified of the proposed use or potential uses.	Section 2.1 Application Submittal Forms	13
Description of the way reclamation, adequate for the proposed use or potential uses, will be accomplished. To include: a. Description of how known contaminants will be controlled, and mining waste will be disposed. b. Description of the way affected streambed channels and streambanks will be rehabilitated to minimize erosion and sedimentation.	a. Section 2.6 b. Section 3.0 All	27 32-41
Assessment of the effect of implementation of the reclamation plan on future mining in the area.	Section 3.14	41

Statement that the person submitting the reclamation plan accepts responsibility for reclaiming the mined lands in accordance with the reclamation plan.	Section 7.0	46
Other information required.	Attachments	
PRC 2772.1		
Information, document, or component of a document prepared as part of a permit application for the surface mining operation or as part of an environmental document prepared for the project shall be incorporated into the reclamation plan or amendment used to satisfy the requirements shall be referenced by Appendix and page number.	Attachments	
PRC 2773(b) – Reclamation Standards		
Wildlife habitat.	Section 3.4	36
Backfilling, re-grading, slope stability and re-contouring.	Section 3.1	33
Revegetation.	Section 3.4	36
Drainage, diversion structures, waterways, and erosion control.	Section 2.8	29
Prime and other agricultural land reclamation.	NA	NA
Building, structure, and equipment removal.	Section 3.3	36
Stream protection.	Section 2.8	29
Topsoil salvage, maintenance, and redistribution.	Section 2.3	15
Tailing and mine waste management.	Section 2.6	27
Article 1. Surface Mining and Reclamation Practice § 3502. The Reclamation Plan		
(1) The environmental setting of the site of operations and the effect that possible alternate reclaimed site conditions may have upon the existing and future uses of surrounding lands.	Section 1.0	2
(2) The public health and safety, considering the degree and type of present and probable future exposure of the public to the site.	Section 3.13	40

(3) The designed steepness and proposed treatment of the mined lands' final slopes shall take into consideration the physical properties of the slope material, its probable maximum water content, landscaping requirements, and other factors. In all cases, reclamation plans shall specify slope angles flatter than the critical gradient for the type of material involved. Whenever final slopes approach the critical gradient for the type of material involved, regulatory agencies shall require an engineering analysis of the slope stability. Special emphasis on slope stability and design shall be necessary when public safety or adjacent property may be affected.	Section 3.0	32
(4) Areas mined to produce additional materials for backfilling and grading, as well as settlement of filled areas, shall be considered in the reclamation plan. Where ultimate site uses include roads, building sites, or other improvements sensitive to settlement, the reclamation plans shall include compaction of the fill materials in conformance with good engineering practice.	Section 2.4	15
(5) Disposition of old equipment.	Section 3.0	32
(6) Temporary stream or watershed diversions.	NA	NA
Article 1. Surface Mining and Reclamation Practice **§ 3503. Surface Mining and Reclamation Practice**		
Soil Erosion Control.	Section 3.12	40
Water Quality and Watershed Control.	Section 2.8 & 5.1	29 & 43
Protection of Fish and Wildlife Habitat.	Section 3.4 & 5.3	36 & 41
Disposal of Mine Waste Rock and Overburden.	Section 2.6	27
Erosion and Drainage.	Section 2.8	29
Resoiling.	Section 2.3 & 3.0	15 & 32
Revegetation.	Section 3.4	36
Article 9. Reclamation Standards		
§ 3703. Performance Standards for Wildlife Habitat.	Section 5.3	41

§ 3704. Performance Standards for Backfilling, Regrading, Slope Stability, and Recontouring.	Section 5.4	42
§ 3704.1. Performance Standards for Backfilling Excavations and Recontouring Lands Disturbed by Open Pit Surface Mining Operations for Metallic Minerals.	N/A	N/A
§ 3705. Performance Standards for Revegetation.	Section 5.5, Attached	42, Attachment B
§ 3706. Performance Standards for Drainage, Diversion Structures, Waterways, and Erosion Control.	Section 5.6	42
§ 3707. Performance Standards for Prime Agricultural Land Reclamation.	Section 5.7	43
§ 3708. Performance Standards for Other Agricultural Land.	Section 5.8	43
§ 3709. Performance Standards for Building, Structure, and Equipment Removal.	Section 3.3 & 5.9	36, 43
§ 3711. Performance Standards for Topsoil Salvage, Maintenance, and Redistribution.	Section 5.11, Attached	43, Attachment B
§ 3712. Performance Standards for Tailing and Mine Waste Management.	Section 5.12	44
§ 3713. Performance Standards for Closure of Surface Openings.	Section 5.13	44

Introduction

Cottonwood Cajon ES, LLC. (Proponent) is currently proposing the Cottonwood Sand Mine on land that is utilized by the Cottonwood Golf Club for two permitted 18-hole golf courses in the Jamacha Valley area of San Diego County, California. Currently, one of the golf courses is not in operation. This land is zoned to allow for extractive uses.

The proponent is applying for a Major Use Permit (MUP) and Reclamation Plan (RP) on 251.1 acres of the 279-acre property. Approval of the MUP and RP would allow for the extraction of approximately 3.8-million cubic yards (5.7-million tons) of washed concrete sand and gravel over a 10-year period. Economic conditions may require an approval of an extension of the permit period beyond the initial 10-year period. Mining will be followed by 2 years of reclamation activities plus time for revegetation monitoring. As mining is completed in phases and selected areas backfilled, the site will be restored with a widened river channel. Potential end uses will be those that are allowed under the General Plan and County Zoning Ordinance. Future development of the site is not included in the Proposed Project and would require subsequent discretionary applications to be filed along with appropriate environmental review. Reclamation and revegetation activities on areas proposed for mining will occur on approximately 214 acres of the 251.1-acre MUP area. Surface areas not disturbed by mining within the MUP area would be subject to removal of invasive species in the river channel on the southwest portion of the site or be left in their current condition. As such, reclamation of the proposed extraction project would not affect existing or future uses of lands surrounding the property as a significant amount of land bordering the project on the south is currently a National Wildlife refuge and a second preserve on the far northeast. Reclamation to primarily native habitat will create a link for wildlife between the two preserve areas.

At full site development, mining and extraction activities will produce approximately 3.8-million cubic yards (5.7-million tons) of sand and gravel, with a maximum annual production level of 380,000 cubic yards (570,000 tons per year (MTPY)). Total material to be excavated is 4,266,900 cubic yards with a 10 percent waste factor that includes wash fines and materials undesirable for processing. Materials not selected for processing will be utilized as backfill. In addition to incorporation of wash fines, imported inert debris also would be utilized to achieve finished grades. Final reclamation will follow on the remainder of 214 acres and would be expected to continue for approximately 2 years following completion of mining activities. Associated facilities include a processing plant and all support structures.

The project will be developed and reclaimed in four (4) phases, three mining phases and one final reclamation phase. Initial project activity will involve the creation of a processing area west of the existing parking lot and adjacent to Willow Glen Drive. A portable conveyor system will be installed to transport mined material from the excavation areas to the plant for washing and screening, and to transport fill materials from the processing area to the backfill areas once mining has been completed within each subphase area. This conveyor system will be moved to serve each phase as the project progresses. Successful reclamation will result in a narrower river flood channel with a low flow channel consisting of the existing low-flow channel width and

height of banks up to 3.7 feet in order to retain existing hydrologic characteristics and to accommodate water transfers from the Loveland Reservoir to the Sweetwater Reservoir. Reclamation will also return the site to beneficial end uses allowed by the General Plan and County Zoning Ordinance.
Golf operations will end prior to initiating onsite project activities.

The project will restripe Willow Glen Drive between Steele Canyon Road and the project ingress driveway to provide a raised median and Class II buffered bike lanes on both sides of the roadway. To facilitate deceleration of right-turning vehicles into the project ingress driveway, a dedicated right-turn lane will also be constructed, which will serve as the primary access for mining operations, material sales, employees, and vendors. This road would continue to a new egress point in the approximate center of the existing parking lot (See Sheet 3, Plot Plan). The project will also construct an acceleration lane between the ingress and egress project driveways, which will serve as a refuge lane for trucks to complete their outbound maneuver. Willow Glen Drive between Steele Canyon Road and Hillsdale Road is classified in the Mobility Element as a 4.1B: Major Road with Intermittent Turn lanes. The project frontage along this stretch extends between Steele Canyon Road to approximately 1000' west of Hillsdale Road. In addition to the above improvements, the project proposes to provide an Irrevocable Offer of Dedication along the project frontage as needed to accommodate the ultimate roadway classification of Willow Glen Drive.

A second access road will also be installed on the western edge of the project at the intersection of Muirfield Drive and Willow Glen Drive. This access road will consist of a 2-lane concrete apron that will transition to gravel surface segment of road once on the Cottonwood property and will be used primarily for mobilization/demobilization, servicing of heavy equipment and reclamation for the Phase 1 area west of Steele Canyon Road. Both the Muirfield and existing driveways with gates, will remain in place for the property owner after mining activities end (See Sheet 2, Plot Plan).

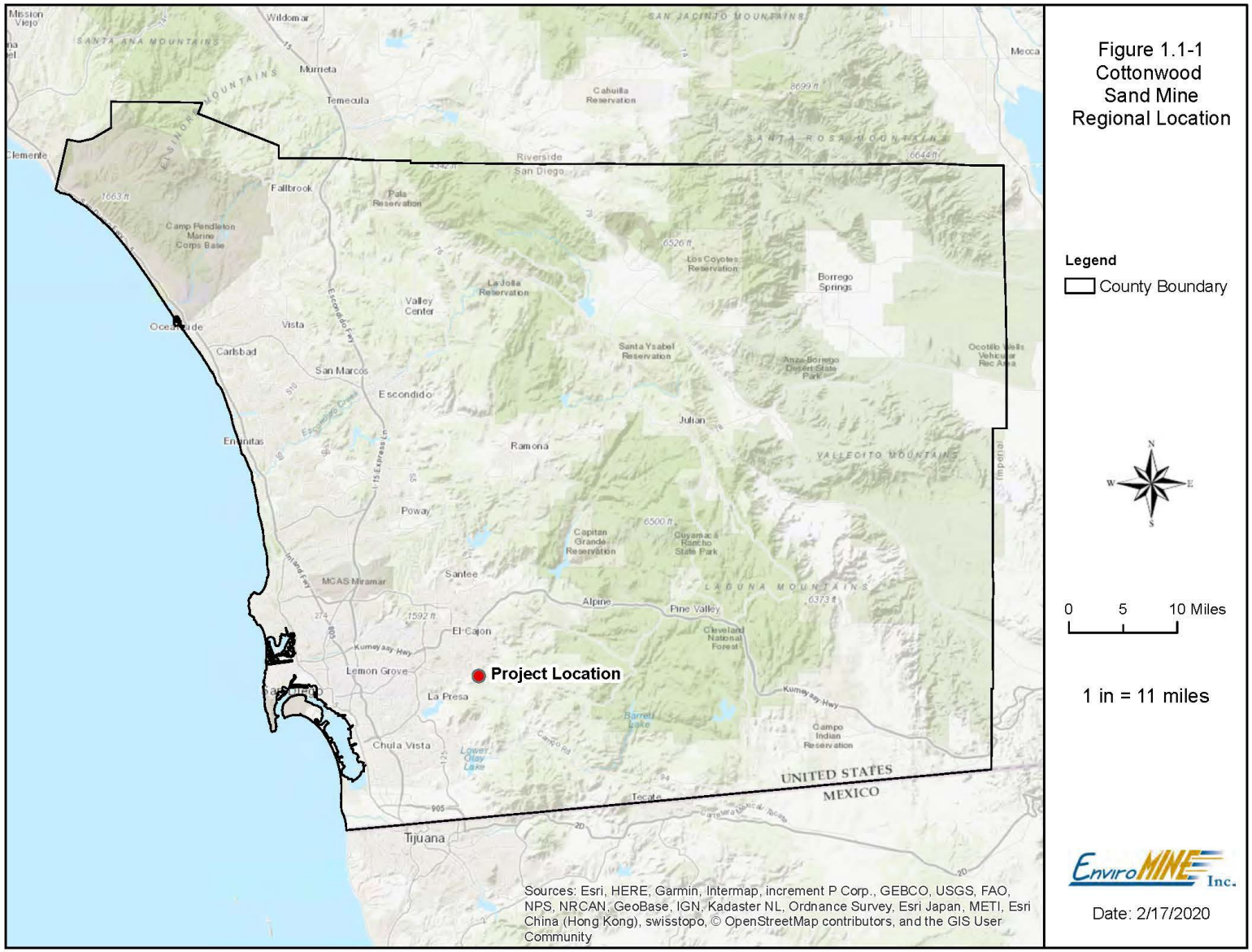
The main entrance to the project site is 0.25 miles northeast of the intersection of Willow Glen Drive and Steele Canyon Road. Willow Glen Drive will serve as the primary route for the project. Residents use both Willow Glen Drive and Steele Canyon Road to access their properties.

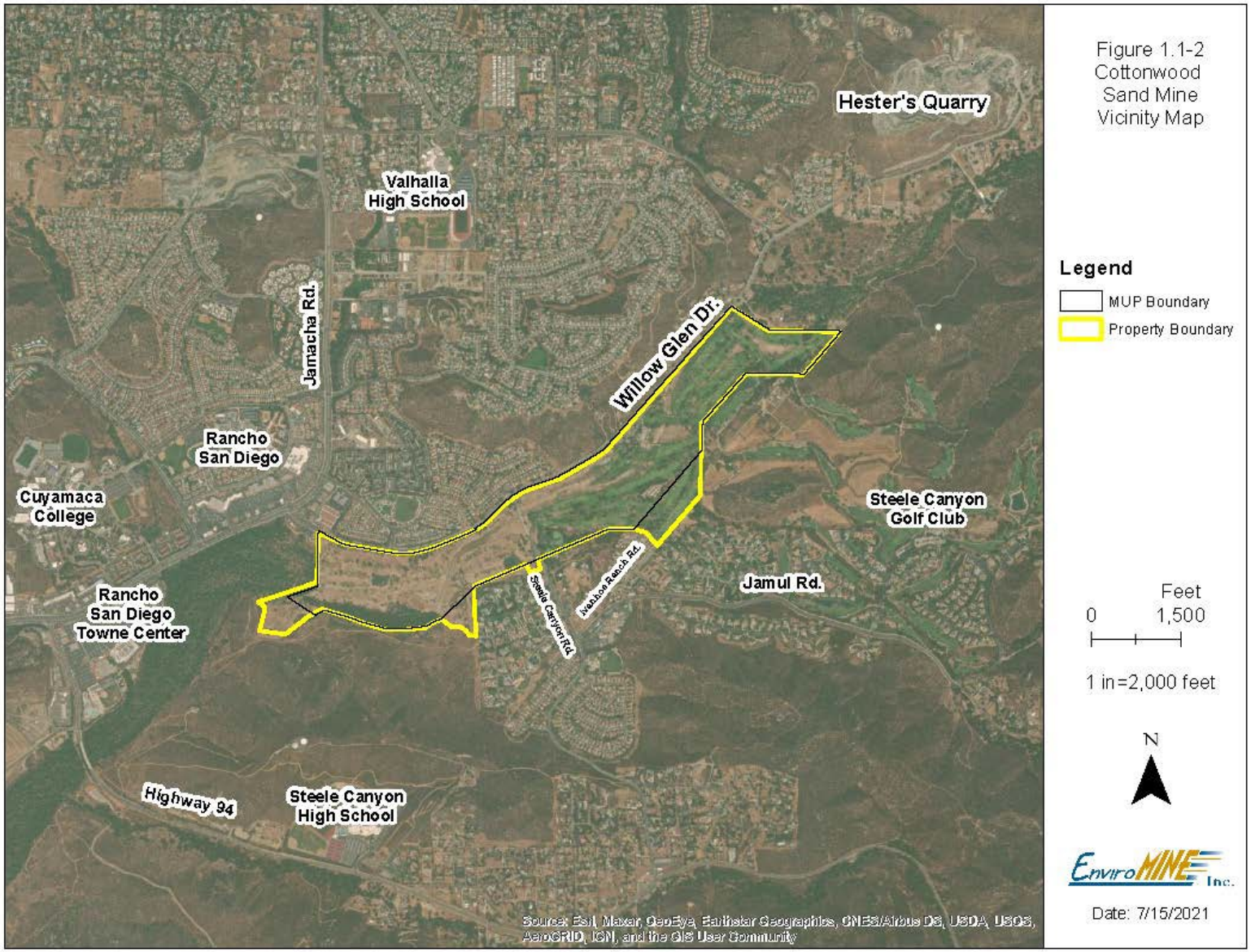
1.0 Environmental Setting

1.1 Project Location

The project site is situated on the floodplain of the Sweetwater River which flows through the central part of the project site. It is located parallel to Willow Glen Drive and on both sides of Steele Canyon Road in the unincorporated Jamacha-Rancho San Diego area of San Diego County, CA (Figures 1.1-1, 1.1-2).

The western RP boundary for the project is 1.2 miles northeast of the bridge on State Route 94, where the highway crosses the Sweetwater River. The eastern RP boundary is approximately 6.5 miles west, southwest of the Loveland Reservoir dam.


Figure 1.1-1
Cottonwood
Sand Mine
Regional Location
Legend
County Boundary
N
W
E
S
0 5 10 Miles
1 in = 11 miles
Project Location
UNITED STATES
MEXICO
Tijuana
Chula Vista
Lemon Grove
La Presa
El Cajon
Santee
Poway
Ramona
Escondido
San Marcos
Vista
Carlsbad
Oceanside
Encinitas
Fallbrook
Temecula
Murrieta
Wildomar
Mission Viejo
Riverside
San Diego
Borrego Springs
Julian
Alpine
Pine Valley
MCAS Miramar
Camp Pendleton Marine Corps Base
Pala Reservation
La Jolla Reservation
Valley Center
Santa Ysabel Reservation
Los Coyotes Reservation
Cahuilla Reservation
Capitan Grande Reservation
Campo Indian Reservation
Cleveland National Forest
Cuyamaca Rancho State Park
Anza-Borrego Desert State Park
SANTA ANA MOUNTAINS
SAN JACINTO MOUNTAINS
SANTA ROSA MOUNTAINS
VALLECITO MOUNTAINS
LAGUNA MOUNTAINS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
EnviroMINE Inc.
Date: 2/17/2020


Hester's Quarry
Valhalla
High School
Jamacha Rd.
Willow Glen Dr.
Rancho
San Diego
Cuyamaca
College
Steele Canyon
Golf Club
Jamul Rd.
Rancho
San Diego
Towne Center
Highway 94
Steele Canyon
High School
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Figure 1.1-2
Cottonwood
Sand Mine
Vicinity Map
Legend
MUP Boundary
Property Boundary
Feet
0
1,500
1 in=2,000 feet
N
EnviroMINE Inc.
Date: 7/15/2021

1.2 Assessor Parcel Numbers, Ownership and Zoning

The Project has twenty-two separate Assessor Parcel Numbers (APNs). (Figure 1.2-1)

Table 1. Assessor Parcels

APN	TOTAL ACRES (approx.)	OWNER	ZONING[1]	LAND USE DESIGNATION[2]
506-021-1900	8.20	Cottonwood Cajon ES, LLC	S88	OS-R
506-020-5200	4.01	Cottonwood Cajon ES, LLC	S80	OS-R
518-012-1300	2.97	Cottonwood Cajon ES, LLC	S90	OS-R
518-012-1400	46.61	Cottonwood Cajon ES, LLC	S90	OS-R
518-030-0500	2.30	Cottonwood Cajon ES, LLC	S90	OS-R
518-030-0600	5.58	Cottonwood Cajon ES, LLC	S90	OS-R
518-030-0700	2.59	Cottonwood Cajon ES, LLC	S90	OS-R
518-030-0800	0.69	Cottonwood Cajon ES, LLC	S90	OS-R
518-030-1000	7.16	Cottonwood Cajon ES, LLC	S90	OS-R
518-030-1200	6.88	Cottonwood Cajon ES, LLC	S90	OS-R
518-030-1300	10.20	Cottonwood Cajon ES, LLC	S90	OS-R
518-030-1500	4.04	Cottonwood Cajon ES, LLC	S90	OS-R
518-030-2100	56.71	Cottonwood Cajon ES, LLC	S90	OS-R
518-030-2200	19.43	Cottonwood Cajon ES, LLC	S90	OS-R
519-010-1500	33.72	Cottonwood Cajon ES, LLC	S90	OS-R
519-010-1700	14.59	Cottonwood Cajon ES, LLC	S90	OS-R
519-010-2000	19.22	Cottonwood Cajon ES, LLC	S90	OS-R
519-010-2100	1.10	Cottonwood Cajon ES, LLC	S90	OS-R
519-010-3300	1.76	Cottonwood Cajon ES, LLC	S90	OS-R
519-010-3400	7.17	Cottonwood Cajon ES, LLC	S90	OS-R
519-010-3700	1.06	Cottonwood Cajon ES, LLC	S90	OS-R
519-011-0700	23.80	Cottonwood Cajon ES, LLC	S88	OS-R
Totals:	**279.79**			

[1] S90 - Holding Area - allows extractive uses of mining and processing with a Major Use Permit,
S88 - Specific Planning Area - allows extractive use of site preparation with a Minor Use Permit. This area will be disturbed for water course improvement by the removal of material.
S80 - Open Space -allows extractive uses of mining and processing with a Major Use Permit.

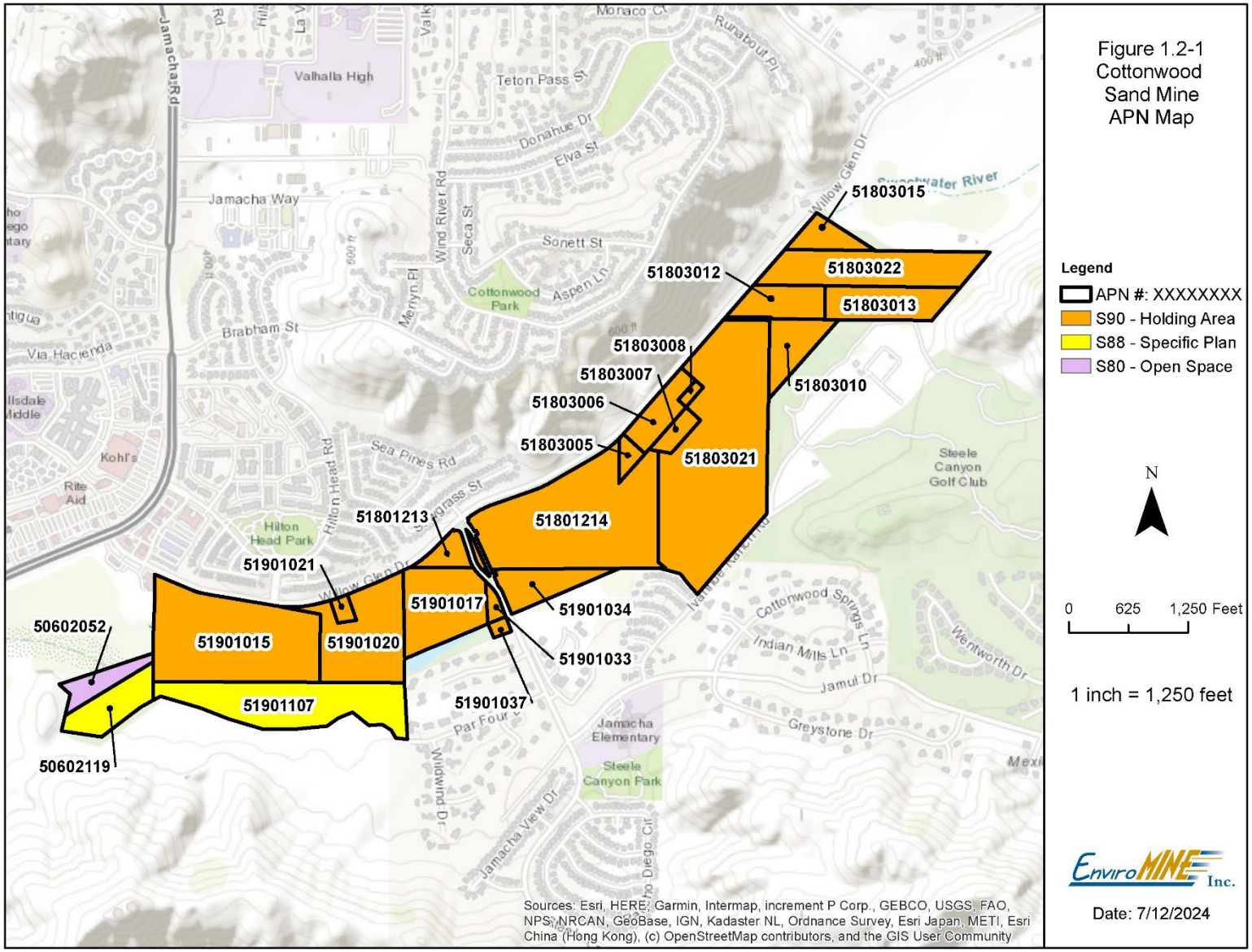
[2] General Plan Land Use Designation is OS-R, Open Space – Recreation

1.3 Legal Description

The project is located within portions of Sections 9, 10, and 16, Township 15 South, Range 1 East of the El Cajon Mountain, California, U.S. Geological Survey (USGS) 7.5-minute quadrangle, San Bernardino Base and Meridian, County of San Diego, California at approximately 32°52' 38.53" N latitude -116° 52' 50.00 W longitude.

1.4 General Physiography

The RP area is located within the Foothills Physiographic Province of the Peninsular Ranges of Southern California. Site geology is composed of Quaternary Alluvium underlain by Cretaceous tonalite with some granodiorite and quartz diorite. (Tan, S.S., 2002a, 2002b.)


Figure 1.2-1
Cottonwood
Sand Mine
APN Map
Legend
APN #: XXXXXXXX
S90 - Holding Area
S88 - Specific Plan
S80 - Open Space
N
0
625
1,250 Feet
1 inch = 1,250 feet
EnviroMINE Inc.
Date: 7/12/2024
51803015
51803022
51803013
51803012
51803008
51803007
51803006
51803005
51803010
51803021
51801214
51801213
51901021
51901017
51901034
51901033
51901037
51901015
51901020
51901107
50602052
50602119
Valhalla High
Jamacha Rd
Jamacha Way
Teton Pass St
Donahue Dr
Elva St
Wind River Rd
Seca St
Sonett St
Aspen Ln
Cottonwood Park
Merryn Pl
Brabham St
Via Hacienda
Sea Pines Rd
Hilton Head Rd
Hilton Head Park
Kohl's
Rite Aid
Steele Canyon Golf Club
Willow Glen Dr
Runabout Pl
Monaco Ct
Cottonwood Springs Ln
Indian Mills Ln
Jamul Dr
Greystone Dr
Wentworth Dr
Par Four Ln
Jamacha Elementary
Steele Canyon Park
Jamacha View Dr
Windmill Dr
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

The topography in the project vicinity is characterized by steep terrain to the north and south of the alluvial valley. Elevations range from approximately 1,100 feet above mean sea level (MSL) north of the site to approximately 360 feet near the river channel. The topography of the Project site is generally flat with an overall gentle slope to the west. This area includes ponds that are part of the golf course layout. Elevations within the excavation area range from approximately 377 feet AMSL in the east to 329 feet AMSL on the western end. The Sweetwater River extends in a general east-west direction and consists of a low-flow channel and the associated floodplain.

1.5 Climate

The general climate in the region is regarded as dry, subhumid mesothermal, with warm dry summers and cold moist winters. Mean annual temperature is between 60 and 62-degrees Fahrenheit with a mean annual precipitation between 14 and 18 inches. The frost-free season is 260 to 300 days (HELIX Environmental Planning, 2024).

1.6 Geology

Regional Geology

The Project lies atop the southern California batholith consisting of early Cretaceous granitic rocks. These rocks form the majority element of this massive feature that underlies roughly two-fifths of San Diego County. Recent geologic mapping of the Jamul and El Cajon 7.5-minute quadrangles indicate the exposed granitic bedrock is comprised of tonalite that includes some granodiorite and quartz diorite. (Tan, S.S., 2002a, 2002b)

The Sweetwater River drains northeast-southwest through the project area and has contributed deposits of alluvium on the river's floodplain.

Site Geology

The RP area is underlain by Quaternary alluvial deposits that are unconsolidated to locally poorly consolidated silt, clay, sand, and gravel. Geologic units encountered or observed during subsurface exploration included undocumented fill, alluvium, and granitic bedrock (Attachment C, Soil and Geologic Reconnaissance). Groundwater was encountered at depths ranging from approximately 6 feet and deeper.

1.7 Surface and Groundwater

Surface Water

The project is in an area with a semi-arid Mediterranean climate with warm, dry summers and most rainfall occurring during the cooler winter months. Surface water on site is ephemeral and only present during precipitation events or water releases from the Loveland Reservoir. The site lies within the Sweetwater River drainage basin about 4.8 miles west of Loveland Reservoir dam. Designated beneficial uses for the Sweetwater River and its tributaries include municipal and domestic supply; agricultural supply; industrial service supply; industrial process supply; contact and non-contact water recreation; warm freshwater habitat; cold freshwater habitat; wildlife habitat; and rare, threatened, or endangered species habitat (California

RWQCB, 1994). Jurisdictional waters consist of the main channel of the Sweetwater River between 3.1 and 5.5 miles downstream of the Loveland Reservoir.
Although within the County's effective floodway, the project will not raise the 100-year water surface elevations, so meets the County and FEMA's floodway regulations. In addition, the project will not create adverse flood impacts within the study reach, which is consistent with the goals of floodplain regulations (Attachment E, Hydraulic Analyses).

Ground Water
An alluvial aquifer underlies the Project site. The maximum depth to bedrock at the site is approximately 55 feet, with the alluvium pinching out along the northwestern and southeastern limits of the aquifer along the bedrock valley walls.

The width of the alluvial aquifer from north to south ranges from 1,000 feet to approximately 1,500 feet on the Project site. During a geologic investigation of the property, groundwater levels were encountered from 5 to 18 feet bgs. Because the property is situated in a drainage area, groundwater elevation is expected to fluctuate between dry and rainy periods from year to year (GeoCon, 2019, rev. 2020). Groundwater flows regionally from east to west and locally toward groundwater wells. Natural groundwater recharge in the area is highly variable and is dependent on climatic conditions.

1.8 Soils

Three soil series represent most of the soil within the project boundary as identified in the United States Department of Agriculture 1973 Soil Survey (USDA, 1973). These include the Tujunga series, Riverwash, and the Visalia series (Figure 1.8-1). Other similar soil mapping units are identified but these occur as very narrow strips or small pockets of mapped soils immediately adjacent to Willow Glen Drive and upland areas on the southern side of the project area. These minor units are on the outer fringes of the project, and most will not be disturbed. The three dominant soil mapping units are described as follows:

Tujunga sand, 0 to 5 percent slopes (TuB). The soil occurs on alluvial fans and flood plains. Slopes are dominantly 2 percent. This unit represents the largest area of mapped soil material within the project's boundary.

The Tujunga series consists of very deep excessively drained sands derived from granitic alluvium. These soils are on alluvial fans and flood plains and have slopes of 0 to 5 percent. The elevation ranges from sea level to 1,500 feet. The native vegetation generally occurring in uncultivated areas is chiefly annual grasses, forbs, and a few scattered oaks.

In a representative profile, the surface layer color is brown, neutral sand about 14 inches thick. The color of the next layers are pale-brown, neutral sand and coarse sand. This material extends to a depth of more than 60 inches. Fertility is low.

Permeability is very rapid. The available water holding capacity is 3 inches. Runoff is slow to very slow and the hazard is slight. Roots easily penetrate to a depth of 60 inches. Short periods of flooding are probable during wet years.

Tujunga soils are used mainly for range and golf courses. A few small areas are used for avocados, flowers, and truck crops when farmed.

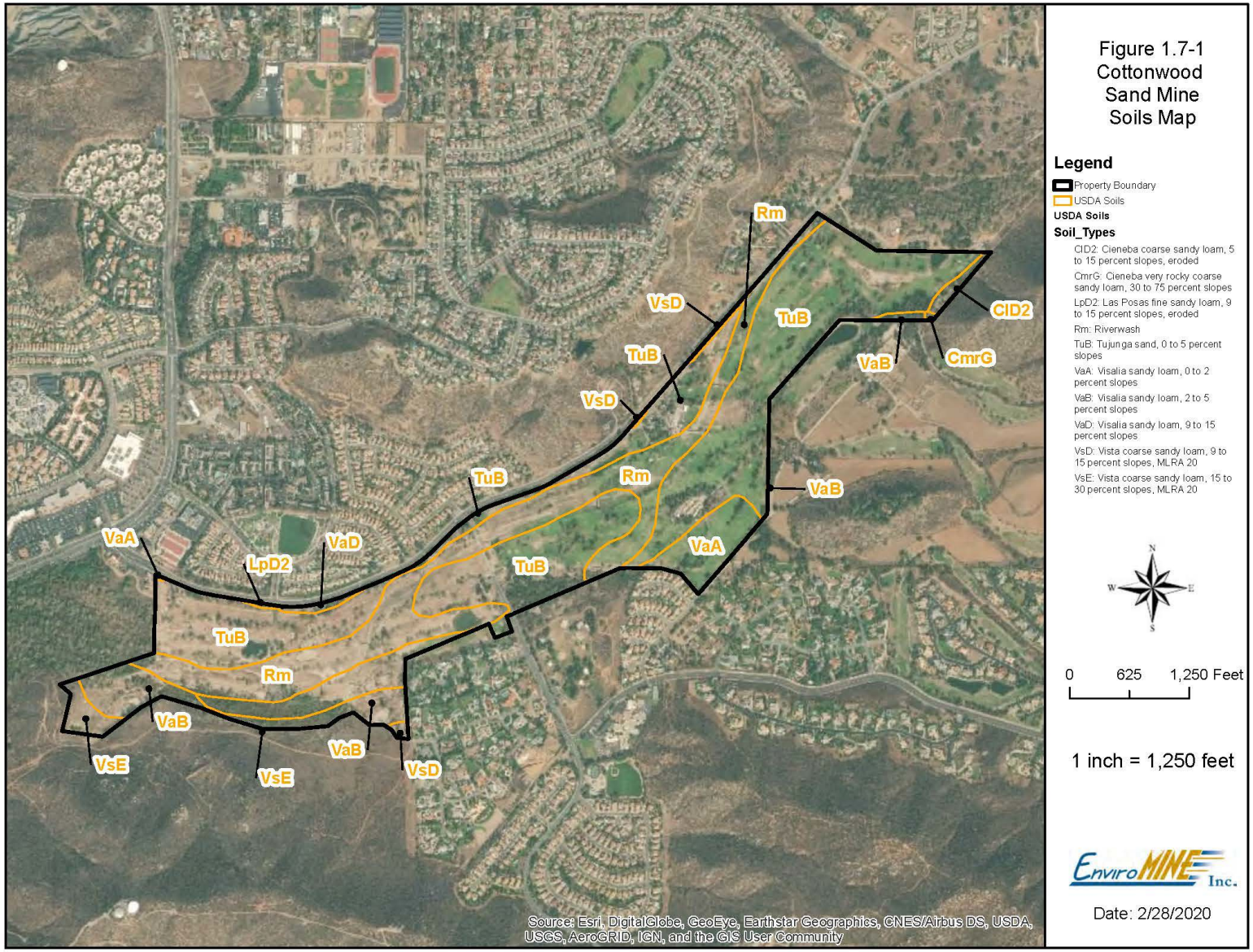
Riverwash (Rm). The Riverwash soil mapping unit occurs in intermittent stream channels. The material is typically sandy, gravelly or cobbly. It is excessively drained and rapidly permeable. Many areas are barren. Sparse shrubs and forbs occur in patches.

Visalia sandy loam, 0 to 2 percent slopes (VaA). This nearly level to level soil is on floodplains. Slopes are dominantly 2 percent.

The Visalia series consists of moderately well drained, very deep sandy loams derived from granitic alluvium. These soils are on alluvial fans and flood plains and have slopes of 0 to 15 percent. The elevation ranges from 400 to 2,000 feet. The native vegetation in uncultivated areas is chiefly annual grasses, chamise, flattop buckwheat, California live oak, and scrub oak.

In a representative profile, the surface layer is dark grayish brown, slightly acid sandy loam about 12 inches thick. The next layers are dark grayish brown, slightly acid sandy-loam and loam. This material extends to a depth of more than 60 inches. In some areas the soil is gravelly throughout.

(space left blank intentionally)


Rm
VsD
TuB
CID2
TuB
VaB
CmrG
VsD
TuB
Rm
VaB
VaA
LpD2
VaD
TuB
TuB
Rm
VaB
VaB
VsE
VsE
VsD
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Figure 1.7-1
Cottonwood
Sand Mine
Soils Map
Legend
Property Boundary
USDA Soils
USDA Soils
Soil_Types
CID2: Cieneba coarse sandy loam, 5 to 15 percent slopes, eroded
CmrG: Cieneba very rocky coarse sandy loam, 30 to 75 percent slopes
LpD2: Las Posas fine sandy loam, 9 to 15 percent slopes, eroded
Rm: Riverwash
TuB: Tujunga sand, 0 to 5 percent slopes
VaA: Visalia sandy loam, 0 to 2 percent slopes
VaB: Visalia sandy loam, 2 to 5 percent slopes
VaD: Visalia sandy loam, 9 to 15 percent slopes
VsD: Vista coarse sandy loam, 9 to 15 percent slopes, MLRA 20
VsE: Vista coarse sandy loam, 15 to 30 percent slopes, MLRA 20
N
W
E
S
0
625
1,250 Feet
1 inch = 1,250 feet
EnviroMINE Inc.
Date: 2/28/2020

1.9 Biology

Vegetation
The approximately 280-acre property supports 15 vegetation communities/habitat types: disturbed wetland, freshwater marsh, southern cottonwood-willow riparian forest (including disturbed), southern willow scrub (including disturbed), tamarisk scrub, arundo-dominated riparian, open water, Diegan coastal sage scrub (including disturbed), non-native grassland, artificial pond, eucalyptus woodland, non-native woodland, non-native vegetation, disturbed habitat, and developed lands (HELIX Environmental Planning, 2023). The project site is predominately characterized by disturbed habitat and developed lands associated with the Cottonwood Golf Club development, use, and maintenance since the mid-1960's. The 18-hole golf course located east of Steele Canyon Road has been non-operational since the summer of 2017 when golf play was suspended. This portion of the site consists of disturbed habitat dominated by ruderal vegetation such Bermuda grass (*Cynodon dacytlon*), Russian thistle (*Salsola tragus*), and annual grasses (*Bromus* spp.). The non-operation portion of the site is still mowed periodically as part of fire control efforts. The eastern portion of the site consists of developed lands with features associated with active operations of the golf course such as fairways (landscaped with Bermuda grass), cart paths, club house, parking lot, and landscaping. Native (Freemont cottonwood [*Populus freemontii*]) and non-native (Peruvian pepper [*Schinus molle*], shamel ash [*Fraxinus udehi*], northern catalpa [*Catalpa speciosa*], and gum tree [*Eucalytpus* spp.]) trees have been planted throughout the project to generally mark the sides of the fairways and screen the golf course from Willow Glen Drive.

The Sweetwater River flows through the project site entering at the northeastern site boundary, traveling in a southwesterly direction, and exiting at the southwestern site boundary. Water is generally absent from the streambed throughout most of the year as flow levels are controlled mainly by upstream impoundments such as the Loveland Reservoir. The streambed is generally unvegetated and subject to maintenance activities, such as mowing. The segment of the river east of Steele Canyon Road transitions between unvegetated portions and portions vegetated with Bermuda grass associated with the golf course's landscaping. The segment of the river southwest of the Steele Canyon Road is mostly unvegetated with areas of sandy soils. The downstream segment of the river supports native and non-native riparian habitat consisting of southern willow scrub, southern cottonwood-willow riparian forest, and tamarisk scrub. Dominant plant species include Freemont cottonwood, arroyo willow (*Salix lasiolepis*), black willow (*Salix gooddingii*), mule fat (*Baccharis salicifolia*), tamarisk (*Tamarix* sp.), and giant reed (*Arundo donax*).

Native wetland and upland habitat types within the project site such as southern willow scrub and Diegan coastal sage scrub occur in relatively small or narrow areas. Most of these areas are also disturbed with high cover of non-native plant species. Those areas that are not disturbed, occur at the edges of the project site, are connected existing undeveloped habitat or preserved areas that occur to the southwest and northeast of the site, and generally be avoided by the proposed project.

Wildlife
The project site is highly disturbed and subject to heavy human use. The site supports wildlife species commonly observed in areas that have undergone

modification and/or degradation. Common species observed during the biological surveys include western fence lizard (*Sceloporus occidentalis*), American crow (*Corvus brachyrhynchos*), house finch (*Haemorhous mexicanus*), lesser goldfinch (*Spinus psaltria*), mourning dove (Zenaida macroura), red-tailed hawk (*Buteo jamaicensis*), Acorn woodpecker (*Melanerpes formicivorus*), desert cottontail (*Sylvilagus audubonii*), and California ground squirrel (*Otospermophilus beecheyi*).

Several special status animal species were observed within the project site or flying overhead including Cooper's hawk (*Accipiter cooperii*), great blue heron (*Ardea herodias*), Belding's orange-throated whiptail (*Aspidoscelis hyperythrus beldingi*), oak titmouse (*Baeolophus inornatus*), red-shouldered hawk (*Buteo lineatus*), green heron (*Butorides virescens*), turkey vulture (*Cathartes aura*), monarch butterfly (*Danaus plexippus*), peregrine falcon (*Falco peregrinus*), yellow-breasted chat (*Icteria virens*), coastal California gnatcatcher (*Polioptila californica californica*), vermilion flycatcher (*Pyrocephalus rubinus*), yellow warbler (*Setophaga petechia*), western bluebird (*Sialia mexicana*), Lawrence's goldfinch (*Spinus lawrencei*), barn owl (*Tyto alba*), small-footed myotis (*Myotis ciliolabrum),* Townsend's big-eared bat *(Corynorhinus townsendii pallescens),* western mastiff bat (*Eumops perotis*), western red bat (*Lasiurus blossevillii*), white-tailed kite (*Elanus leucurus*), yuma myotis (*Myotis yumanensis*), and least Bell's vireo (*Vireo bellii pusillus*). U.S. Fish and Wildlife Service (USFWS) critical habitat for the coastal California gnatcatcher and least Bell's vireo occur in the riparian habitat within the southwestern portion of the site, and critical habitat for the southwestern willow flycatcher is present immediately adjacent to the site.

Wildlife movement through the site would be limited based on the current and past use of the site as an active golf course. Common predators and mesopredators that may be present within the surrounding area and utilize the golf course for limited foraging or movement activities include coyote (*Canis latrans*), racoons (*Procyon lotor*), and striped skunk (*Mephitis mephitis*). Larger species such as bobcat (*Lynx rufus*) and mule deer (*Odocoileus hemionus*) may also be present in the area and have potential to move through the project site. However, these species would generally be minimal based on the presence of human activities, surrounding residential development, and availability of open space areas to the south that may be more conducive to wildlife movement patterns and habitat requirements.

1.10 Mineral Resources

The Surface Mining and Reclamation Act of 1975 (SMARA) mandated the initiation by the State Geologist of mineral land classification to help identify and protect mineral resources in areas within the State subject to urban expansion or other irreversible land uses which would preclude mineral extraction. SMARA also allowed the State Mining and Geology Board (SMGB), after receiving classification information from the State Geologist, to designate lands containing mineral deposits of regional or statewide significance.

The objective of classification and designation processes is to ensure, through appropriate lead agency policies and procedures, that mineral deposits of statewide or of regional significance are available when needed.

The California Geological Survey (CGS) classifies California mineral resources with the Mineral Resource Zones (MRZs) system. These zones have been established based on the presence or absence of significant sand and gravel deposits and crushed rock source area used as construction aggregate. The following definitions of the zones on or directly adjacent to the project area are as follows: (CGS, 1982 and 1996b).

- MRZ-1 - Areas where geologic information indicates no significant mineral deposits are present.
- MRZ-2 - Areas where adequate information indicates that significant mineral deposits are present or where it is judged that there is a high likelihood for their presence.
- MRZ-3 - Areas containing mineral deposits, the significance of which cannot be evaluated from available data.

The property was previously classified by the California Geological Survey (CGS) as a combination of MRZ-3 and MRZ-4 with a small section of MRZ-2 land located on the northeast end of the property. In 2017, CGS released Special Report 240 *Update of Mineral Land Classification: Portland Cement Concrete-Grade Aggregate in The Western San Diego County Production-Consumption Region, California* which reclassified the property from MRZ-3 and MRZ-4 to MRZ-2 (CGS, 2017). This reclassification action was based on an aggregate resource evaluation report (TerraMins, 2006) provided to CGS in 2016 by the property owner. A classification of MRZ-2 indicates that the area is underlain by mineral deposits where geologic data show that significant measured or indicated resources are present.

2.0 Reclamation Plan

2.1 Owner/Operator/Agent

Applicant
Cottonwood Cajon ES, LLC.
3121 Willow Glen Drive
El Cajon, CA 92019
Contact: Brice Bossler
Phone: (619) 850-1399

Name of Mineral Property
Cottonwood Sand

Property and Mineral rights Ownership
Cottonwood Cajon ES, LLC
3121 Willow Glen Drive
El Cajon, CA 92019

Operator
Cottonwood Cajon ES, LLC
3121 Willow Glen Drive
El Cajon, CA 92019

Agent
Warren R. Coalson, James A. DeCarolis
EnviroMINE, Inc.
4711 Viewridge Avenue, Suite 270
San Diego, CA 92123
Phone: (619) 284-8515

Mineral Commodity
Construction aggregate

Surface Mining Initiation Date
January 1, 2025 (estimated)

Proposed Closure Date
December 31, 2036. Operations may continue through approval of a MUP time extension beyond the proposed 10-year MUP termination date if required to fully exhaust permitted mineral reserves of 3.8-millon cubic yards of production.

Maximum Anticipated Annual Production
380,000 cubic yards x 1.5 tons/cubic yard = 570,000 tons

Total Anticipated Production
3.8-million cubic yards x 1.5 tons/cubic yard = 5.7-million tons

Maximum Anticipated Depth of Surface Mining
Range: 295 feet to 354 feet AMSL (up to 40' below existing ground surface)

2.2 Operational Characteristics

Operations in the RP area will extract, process, and market aggregate using conventional earth moving and processing equipment. Extractive operations for the project are expected to continue for approximately 10 years with a total production of 3.8-million cubic yards (5.7-million tons). Operations may be continued through approval of a MUP time extension beyond this period depending on the demand for aggregate or geologic conditions encountered during the mining process. Extractive and processing activities will produce up to approximately 380,000 cubic yards (570,000 tons) of material per year. Table 2 presents the anticipated volumes of material to be mined during each phase of the project. Extracted aggregate suitable for construction uses will be transported offsite to construction projects and batch plants in San Diego County. Material will be sold in bulk to various customers. The Plot Plan for the extractive operations is presented as Attachment A - Plot Plan.

The operation will be extracting materials from the alluvial deposits of the Sweetwater River and will have equipment crossings over the existing river channel or parallel to that channel. Sweetwater Authority utilizes this existing low flow channel to transfer water from the upstream Loveland Reservoir to the downstream Sweetwater Reservoir as part of their management of the water resource. This transfer typically occurs when soils are saturated during the wet winter months of December to March to minimize water losses from the released water through percolation. To avoid interrupting or interfering with Sweetwater's water transfers, Cottonwood has established an operating procedure to maintain communication with Sweetwater

Authority prior to, and during, these water transfers. This procedure is provided as Attachment D and will be made a condition of the MUP.

2.3 Topsoil Removal & Proposed End Use

The post mining end use of the Cottonwood property may include uses allowed by the General Plan and County Zoning Ordinance. Materials in the area are very sandy at depth and very similar to the existing topsoil. Approximately 6-inches of topsoil will be salvaged from the disturbed area and stored in stockpiles along the upper edges of the excavation boundaries and identified with signage. When possible, topsoil will be stripped from the surface and directly re-applied to areas that have reached final grade to avoid storing soil.

Topsoil material will be stored in the berm like stockpiles and may be mixed with wash fines that will be used as a final cover on areas that have reached final grade. Topsoil stockpiles will not be disturbed until used for revegetation, if it can be avoided, and will be covered or seeded with a recommended seed mix if not to be used within six months. In general, it is expected that an individual topsoil stockpile will be utilized for reclamation within 12 to 14 months after being salvaged unless it is used to assist visual or noise attenuation during a specific phase. All stockpiles will be utilized when excavation and backfilling has been completed in a phase.

The topsoil within the plan boundary is expected to be heavily infused with a massive, subterranean seed bank containing the seeds of the non-native and/or invasive species. These are not desirable as end-product plants. Aggressive weed eradication is an important objective as the pit develops and during reclamation. As a result, any re-applied top-dressing material will likely require aggressive weed control to meet the revegetation goals of this project.

2.4 Extraction and Phasing

Mine Phases

Mining operations will occur in three (3) phases with a fourth phase for final reclamation, site cleanup and equipment removal (Figure 2.4-1). Each main phase will include multiple subphases of less than 30 acres. Overall mining and reclamation will generally progress in a west to east direction. The precise location and timing of mining and reclamation is subject to market demand and variations in geologic conditions encountered in the field. Dewatering of these pits are not necessary on this project and will not occur. Each phase will include vegetation removal, topsoil salvaging, resource extraction, backfilling and reclamation.

In Phases 1 through Phase 3, mine pits that may extend up to a total depth of 40 feet below ground will be excavated. Groundwater will likely be encountered and the pit will be limited to 5 acres in size during groundwater presence. This will be accomplished by backfilling mined out areas of the pit with wash fines, overburden, and imported material prior to expanding the pit size. Mined out pit areas will be backfilled to an elevation above groundwater level as the mining phases advance. In areas where excavation extends below the water table, an excavator would be utilized for pit excavation; dewatering would not be required. The excavator would stack

excavated material nearby and a loader would deliver and offload the material into the hopper.

Reclamation will occur within each subphase mining area when final contours have been achieved. Final reclamation of the RP area will be completed in mine Phase 3 and during a Final Reclamation phase (Phase 4). It is anticipated that all four phases of mining and final reclamation will be completed in approximately 12 years. Figure 2.4-1 presents all three phases and subphases on the project.

Operations in the first phase will begin with the grading of the plant site, located north of the river channel and immediately west of the existing paved parking area. Initial activity will consist of developing an access road to the processing area and fill an existing golf course pond to establish a pad area for the loadout and the processing plant. In addition, a truck scale, scale house, three settling ponds and storage containers will be located on the pad area. Electrical power lines and the processing plant equipment will also be installed. A portable conveyor system will also be installed and will be used to transport material from the excavation area to the processing plant. This conveyor line will move to subsequent excavation areas as the project proceeds.

The ingress point will extend from Willow Glen Drive to the location of the processing plant west of the existing parking lot. The plant road will be graded and graveled to accommodate over-the-road truck access to the plant/loading area. As indicated, the processing pad will be located north of the river channel and west of the existing golf course parking lot. An exit point for all vehicles leaving the site will be constructed 300 feet east of the entrance. This onsite road shall be designated as one-way traffic in a counter- clockwise direction.

Wash fines (silt and clay sized particles) from the plant are expected to make up approximately 10 percent of the mined material and will be collected in a series of sediment ponds near the wash plant. Most of the fines will settle in the first pond in the series which is referred to as the muck pond. These ponds will be used to protect surface water quality and to recycle the process water through the settling of silts and clays (wash fines) most of which will settle in the first pond and referred to as the muck pond. These ponds will also be used to collect local runoff which may be transporting earthen solids. These ponds will be cleaned occasionally by removing the sediment collected. Collected wash fines then will be used in the extraction area as backfill for over-excavated areas and the flat to gently sloped areas.

Washed fines and materials undesirable for processing would be transported to backfill areas in one of three ways: (1) low-profile haul truck/tractor-trailer, (2) conveyor and haul truck, and (3) haul truck. For backfill areas north of the channel, the fill materials will be loaded onto a low-profile haul truck or tractor-trailer by an excavator at the processing plant and hauled along the conveyor access road to the backfill areas. Clearance under the Steele Canyon Road bridge is approximately 11 feet in height, which will allow the low-profile haul truck (approximately 9 feet in height with a capacity of 20 cy) or tractor trailer (approximately 8 feet in height with a capacity of 16 cy) to pass beneath without requiring removal of soil material beneath the bridge. For the subphase 1A and 1A-1 and Phases 2 and 3 backfill areas south of the channel, fill material will be delivered from the processing plant area utilizing a

conveyor line across existing golf course bridges. Only one conveyor line would be installed across each bridge at a time. A separate conveyor would be used to transport excavated material to the processing plant; transport of fill material to backfill areas would not interfere with transport of excavated material from active mining areas. The conveyor would transport material to Phase 2 or 3 where it would be offloaded for distribution to backfill areas. In order to allow for clearance below the Steele Canyon Road bridge, a tractor-trailer would be used to transport backfill material offloaded from a conveyor positioned within the Phase 2 area south of the channel, under the Steele Canyon Road bridge to the subphase 1A and 1A-1 backfill areas. For Phase 2 and 3 areas north of the channel (subphases 2A and 3D), fill material would be transported from the processing plant via haul truck.

West of Steele Canyon Road, all heavy equipment will cross the existing channel to access the Phase 1-A area. On the east side of the of Steele Canyon, heavy equipment will be delivered for the remaining phases south of the channel through the existing maintenance gate located on Ivanhoe Ranch Road. Channel crossings will only be used when there is no water flow in the channel. The conveyor line will cross the channel on one of the existing golf course bridges during all operations south of the channel.

Sediment will initially be stockpiled near the muck pond until it has dewatered. They will be set parallel to the prevailing wind direction for dewatering prior to being used as fill. These stockpiles will be temporary and will be moved to a fill location after drying. Fugitive dust control measures for these stockpiles will include surface watering, use of wind barriers and if necessary, covered with polyethylene tarps.

In addition to the wash fines, approximately 2.5 million cubic yards would be imported to the site to meet the site's overall backfill requirements. The imported material would consist of inert debris only. Inert debris would consist of excavated soil material from development projects, clean demolition materials, and possibly concrete, asphalt and rock. The site would be conditioned to only accept materials suitable for the end use of the site. Imported inert debris would be transported to backfill areas using the same approach described above for wash fines and materials undesirable for processing.

Fill material in the backfill areas will be spread in near-horizontal layers, approximately 8 to 12 inches thick. Thicker lifts may be approved by the geotechnical engineer if testing indicates that the grading procedures are adequate to achieve the required compaction. Each lift will be spread evenly, thoroughly mixed during spreading to attain uniformity of the material and moisture in each layer, brought to near optimum moisture content and compacted by the heavy equipment to a minimum relative compaction of 85 percent in the floodway area and up to 90 percent compaction in upland areas.

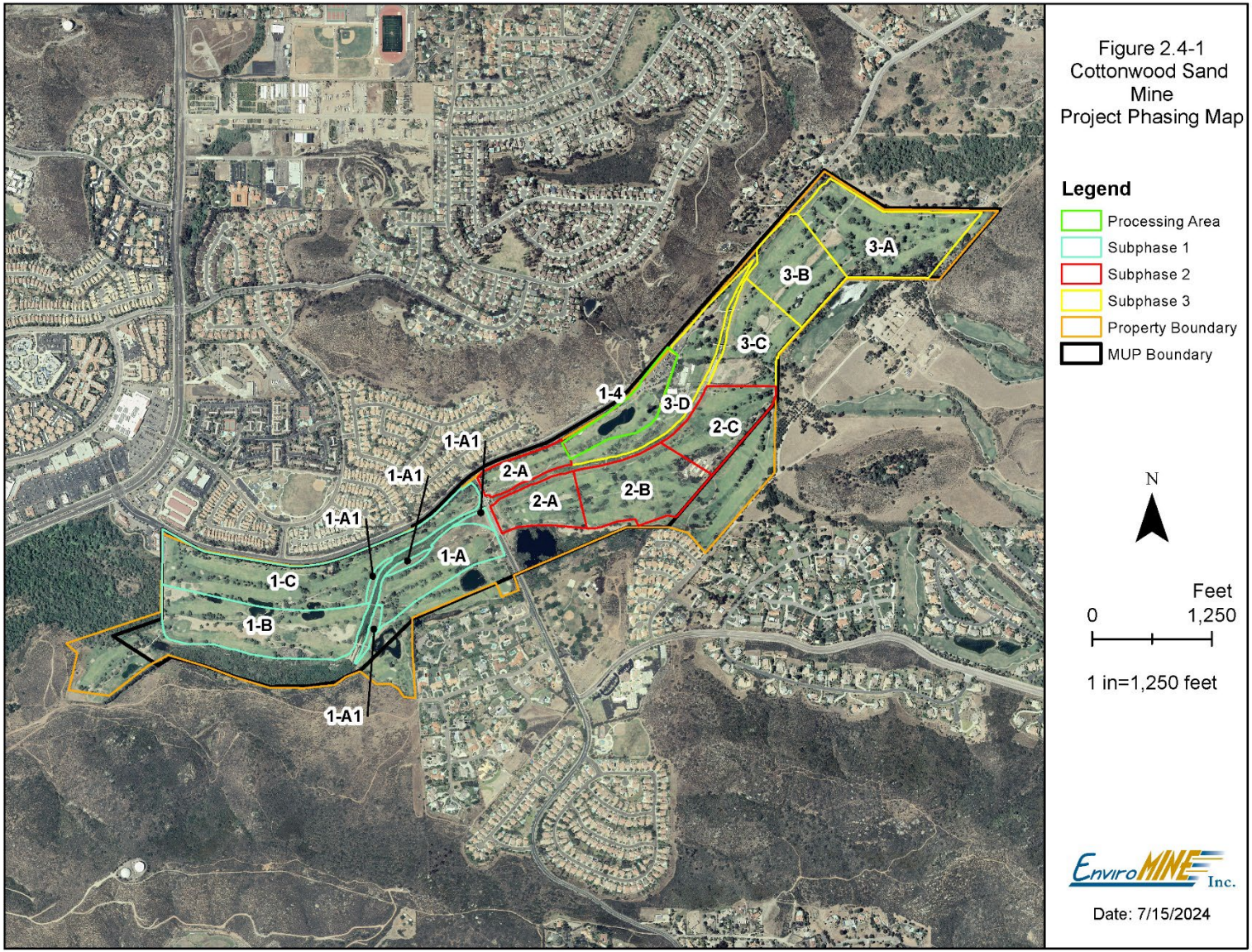
A maintenance program to control weeds on un-reclaimed disturbed ground will be established and implemented at the start of the mining process. The purpose of this effort is to prevent weed infestation of areas that are to be reclaimed in the future. This program will continue during the revegetation and monitoring periods of the project.

Reclamation will be completed as final reclaimed surfaces are established. In the final mining phase, the eastern portion of the project (Phase 3) will be extracted, and the final area of mining related disturbance reclaimed. A final phase (Phase 4) will consist of final reclamation site cleanup and removal of all equipment from the site. Revegetation monitoring will continue after completion of this phase for a minimum of 5 years or until revegetation performance standards are achieved.

At the start of each mining phase, the mining area boundary would be established through surveys that would identify the top of the cut including a setback of 50 feet from the MUP Boundary. A bulldozer or front-end-loader will begin removing vegetation and other deleterious debris from areas to be excavated. Tree stumps and roots will be removed. Clearing and grubbing will extend to the limits of the proposed excavation and fill areas.

Slopes in working cuts may be temporarily steeper than 3:1 (H: V) during operations. If these steeper slopes are to be inactive for a period of 3, or more, weeks, these slopes will be graded to slope ratio of 3:1 (H: V) or shallower.

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Figure 2.4-1
Cottonwood Sand Mine
Project Phasing Map
Legend
Processing Area
Subphase 1
Subphase 2
Subphase 3
Property Boundary
MUP Boundary
N
Feet
0
1,250
1 in=1,250 feet
EnviroMINE Inc.
Date: 7/15/2024
1-A1
1-A1
1-A1
1-A
1-C
1-B
1-A1
1-4
3-D
2-A
2-A
2-B
2-C
3-C
3-B
3-A

Phase 1

The first phase (Phase 1) will include site development for the construction of the access roads, processing area pad, and settling ponds. Following these initial site development activities, extractive operations will commence at the far western portion of the property and include an area of approximately 79 acres. During this phase, an unused residential structure located adjacent to Willow Glen Drive west of Steele Canyon Road will be demolished and all construction waste removed from the property. Phase 1 will be mined in three sub-phases of 30 acres or less and is anticipated to last 3 years or approximately 1 year per subphase. Excavation will begin in the Subphase 1A-1 area. When completed, these areas will be reclaimed immediately as excavation proceeds into the remainder of Subphase 1-A.

Initial extractive operations will salvage approximately 6-inches of topsoil from the surface. Mineral excavation will then proceed to remove all materials from the surface, generally in a southwest to northeast direction, approximately –20 - 25 ft. bgs with an excavator and wheeled front-end-loaders. During sub-phase 1-B and 1-C and area outside the existing channel, excavation may extend 20 feet into the water table using an excavator. Large front-end loaders will transport the mined material to the loading bin connected to the conveyor line. Mined material will then be moved by conveyor to the processing plant where it will be washed, screened, stockpiled and loaded for delivery. As described above, material extracted from the site that is not designated as saleable product would be utilized as backfill to construct the final landform. For Phase 1, wash fines and imported material would be returned to backfill areas by a tractor-trailer using the on-site conveyor line roads and/or over the existing golf course bridges by conveyor to areas south of the channel.

One existing distribution pole owned by SDG&E (#P675043) would be avoided during Phase 1-A excavation, leaving an “island” for the pole. An access ramp would be constructed on the western side of the island to connect to a 14-foot-wide access road which would then connect to an additional access ramp leading to existing access to the southern Project boundary. The ramp and slopes surrounding the pole would be lined, as needed, for access and to prevent erosion. Maintenance of this access road/ramp would ensure that SDG&E maintenance crews are able to access the distribution pole during Project operations.

Reclamation and revegetation within each subphase area would be performed following mining, while mining would move to the next subphase area. The subphase 1A-1 areas would be reclaimed and revegetated first to support visual screening. Once excavation is complete in subphase 1A, the conveyor line and excavating equipment would move to the subphase 1B area on the western edge of the Project site. Reclamation in the subphase 1A area would then begin with final grading/establishment of final slopes and incorporation of wash fines and topsoil, installation of irrigation equipment, and revegetation. This process is proposed to continue in subphases 1B and 1C, with excavation occurring at depths up to 40 feet bgs in both of these subphases. These areas have been identified for mining up to 40 feet bgs. Subphase 1C is the largest of the subphases at approximately 30 acres and is identified as an over-excavation area. In addition to incorporation of wash fines, inert debris also would be utilized to achieve finished grades in this subphase.

Excavation in each subphase is expected to take approximately one year. Upon completion of mining activities in Phase 1, materials and equipment would be moved from the Phase 1 area via the access point at Muirfield Drive, trucked to the access point at Ivanhoe Ranch Road (existing maintenance entrance for golf course), and mobilized to the Phase 2 area. A permanent erosion control riprap structure would be installed on the west side of the Steele Canyon Road bridge following completion of excavation in Phase 1, in order to protect areas near the bridge from downstream erosion. The proposed erosion control riprap structure has been designed to withstand the 100-year design storm.

Phase 2

Phase 2 will continue the identical extraction process in a southwest to northeast direction on the adjacent area east of Steele Canyon Road of approximately 48 acres. The conveyor line and onsite road will be moved to the east. This phase is anticipated to last approximately 3 years and will be separated by three sub-phases of less than 20 acres each. Excavation of the materials will continue and proceed eastward in the same fashion as utilized in Phase 1. Total depth of the excavation is expected to be up to 40 feet below the existing ground surface and is expected to average approximately 20 feet. Excavated materials will be loaded onto the conveyor by a wheeled front-end-loader or tracked excavator.

Reclamation of each sub-phase area will begin as the final landform is established. As described above, both material extracted from the site that is not designated as saleable product as well as imported backfill (inert debris) would be utilized as backfill to construct the final landform. Reclamation will include establishment of final slopes, placement of final cover, revegetation, weed control, irrigation and vegetation monitoring.

Three existing transmission towers owned by SDG&E would be avoided during Phase 2 excavation, leaving an "island" for the towers. An access ramp would be constructed on the western side of the island to connect to a 20-foot-wide access road within the existing SDG&E right-of-way easement that runs from the towers to the southern Project boundary. The ramp and slopes surrounding the towers would be lined, as needed, for access and to prevent erosion. Maintenance of this access road/ramp would ensure that SDG&E maintenance crews are able to access the towers during Project operations.

As Phase 2 nears completion, the remaining golf course building structures on the property, including the maintenance facility will be scheduled for demolition. All construction waste will be removed from the property when demolition is complete.

Phase 3

The excavation process in Phase 3 will continue in a similar nature as the previous phases on approximately 79 acres of the valley, northeast of the Phase 2 area. This phase will proceed from the northeastern end of the pit to the southwest and will consist of four sub-phases. Each sub-phase is expected to be completed within 1 year for a total of 4 years. The maximum depth of excavation would be approximately 40 feet bgs in the eastern portion of subphase 3A.

Reclamation in each of the Phase 3 subphases would begin as the final landforms are established. Reclamation would include establishment of all final slopes; incorporation of inert debris (within over-excavation areas), accumulated wash fines, and topsoil; and revegetation.

Two existing distribution poles owned by SDG&E (#P75709 and #P75700) would be avoided during Phase 3-A excavation, leaving access to the poles from the edge of the pit boundary. Two 14-foot-wide access roads would be left in place at elevation connecting the edge of the pit to the pad surrounding each distribution pole. The ramp and slopes surrounding the pole would be lined, as needed, for access and to prevent erosion. Maintenance of this access road would ensure that SDG&E maintenance crews are able to access the distribution pole during Project operations.

Phase 4

Phase 4 will consist of excavation in the plant area, final reclamation efforts, cleanup and equipment removal. Revegetation monitoring will continue for 5 years or until revegetation standards are met after this final phase.

Approximate acreage and estimated duration of each phase are presented in Table 2.

Table 2. Mine Phase Acreages

Mining Phase	Phase Area (acres)	Sub-phase Area (acres)	Mining Duration (years)	Mining Initiation Date (est.)	Mining Completion Date (est.)	Reclamation Completion Date (est.)
1	78.98		3	2025	2028	2030
Sub-phase 1a		22.10	1			
Sub-phase 1b		26.46	1			
Sub-phase 1c		30.42	1			
2	48.18		3	2028	2031	2033
Sub-phase 2a		15.26	1			
Sub-phase 2b		19.08	1			
Sub-phase 2c		13.74	1			
3	78.57		4	2031	2035	2037
Sub-phase 3a		29.42	1			
Sub-phase 3b		16.15	1			
Sub-phase 3c		14.13	1			
Sub-phase 3d		18.87	1			
Phase 4	8.65		1	2035	2035	2037
Total	214.4		10	-	-	

Notes:
1. Phases will have concurrent mining and reclamation operations.
2. A total of approximately 214 acres is to be reclaimed and revegetated.

Mobile Equipment

Equipment used on the site will be used for extraction and reclamation grading. Specialized equipment for seeding (such as hydroseeding trucks) will be contracted. This specialized type of equipment will be on the site for very short periods during each year throughout the project. Table 3 presents the mobile equipment to be employed on the Project.

Table 3. Project Mobile Equipment

Onsite Mobile Equipment – Extraction and Reclamation				
No.	**Make**	**Type/Model**	**Purpose**	**Usage**
2	Cat	Loader – 988K	Mineral Excavation above water table.	100%
1	Cat	Loader – 988K	Highway truck loading	80%
1	Cat	Loader – 966M-BR	Highway truck loading - backup	20%
1	Freightliner	Water Truck M2106	General dust suppression	75%
1	Cat	Excavator –349F	Mineral extraction -pond cleanout	80%
1	Cat	Dozer – D8T	Rough grading, leveling, ripping	80%
Table 3. – continued				
1	Cat	Haul Truck 730C2EJ/ Tractor Trailer	Onsite transportation of material	40%
1	Cat	Motor Grader 140K	Finish grading, maintenance	30%
1	Cat	Skid Steer Loader-246D	Variety cleanup - reclamation	50%
1	Ford	Pick Up	Transportation for site supervisors, QC	20 miles/day

2.5 Plant Operations

The Cottonwood Mine plant site will consist of aggregate processing and washing facilities, three settling ponds, loadout area and all support structures and buildings (e.g., scale, office kiosk and office trailer) as presented on Figure 2.5-1. No blasting or rock crushing will occur on site. A processing plant will be installed in a fixed location once the pad area and access road are developed.

Shielded night lighting may be installed around the processing plant for safety and security purposes. Lighting will be designed to minimize glare and reflection onto neighboring areas. Generally, mounted sodium, metal halide, fluorescent or LED lighting will be employed. Such lighting minimizes energy use, and in combination with cut-offs, reduces light pollution.

Operations shall comply with the San Diego County Light Pollution Ordinance Number 9974 and Noise Ordinance Number 9962.

Aggregate Processing Plant

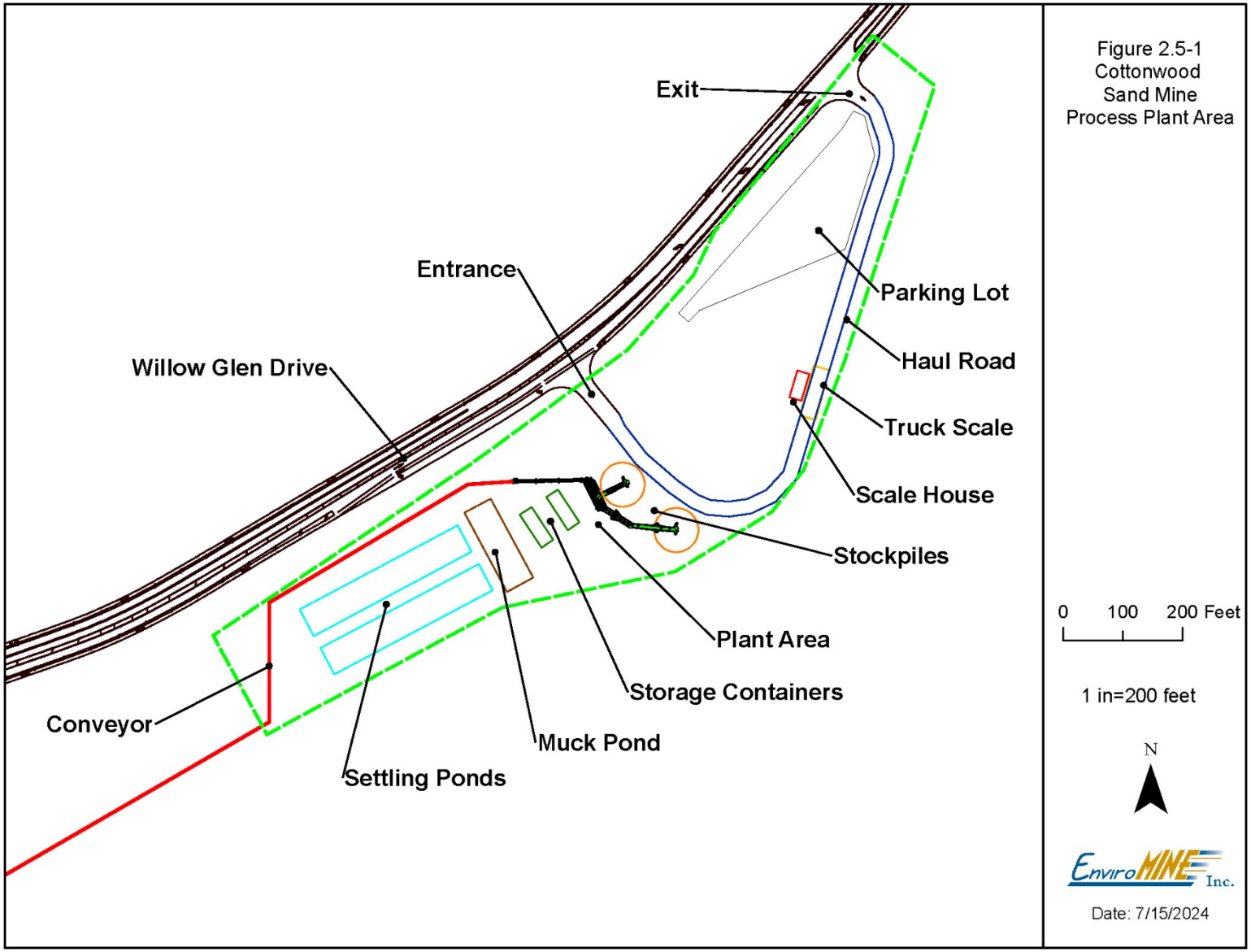
The plant will screen and wash raw material into marketable PCC grade construction aggregate material; washed concrete sand, asphalt sand, pipe bedding and some gravel. No crushing is required to process the materials extracted from the site. Water would be provided by existing groundwater wells on the property. Processed aggregates would be separated into different sizes and stored in stockpiles (up to 25 feet in height) near the plant. Customer trucks would be loaded with finished products from stockpiles by a front-end-loader and transported off-site.

Pole line-power to the plant will be installed in one of the first steps of the project startup and connected to existing power lines on, or adjacent to, the project site. Grading will begin on the pad site and settling ponds constructed. After the processing pad, conveyor line and the access road are in place, a screen deck plant capable of processing 400 tons/hour of raw material will be installed. Extraction of raw material will begin at that time.

After transport to the feed hopper, raw material is emptied directly into the hopper equipped with a water spray bar and covered with a "grizzly" of parallel bars to screen out large cobbles and rock. From the hopper, the material is moved to the belt conveyor which then transports the material to the plant.

The material will be transferred to a blade mill where material is mixed with water to start the process of separating material into different size ranges. From the blade mill, materials drop to a screen deck for final separation. Water is sprayed onto the material throughout the screening process for dust control and to wash any impurities (silt and clay-sized particles) from the material.

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Exit
Entrance
Parking Lot
Willow Glen Drive
Haul Road
Truck Scale
Scale House
Stockpiles
Plant Area
Storage Containers
Conveyor
Muck Pond
Settling Ponds
Figure 2.5-1
Cottonwood
Sand Mine
Process Plant Area
0 100 200 Feet
1 in=200 feet
N
EnviroMINE Inc.
Date: 7/15/2024

The screen deck is a mechanical screening device, which is used to take granulated ore material and separate it into multiple grades by particle size. A screening machine consists of a drive that induces vibration, a screen media that causes particle separation, and a deck which holds the screen media and the drive. This drive is used to cause the vibration that moves material down the screen media. As material becomes too fine to separate by a screen, the material is moved to a fine material screw, or sand screw, for washing. These fine material washers utilize a water bath and inclined augers to separate the clay from the fine and very fine sands that are used in mortar and plaster. Clay materials are then piped to the first in a series of settling ponds where silts and clays settle.

After screening, radial stacker conveyors will be used to stockpile the sized material into individual stockpiles and wash fines are transferred to the settling pond circuit. Processed material will be ground loaded into over-the-road haul trucks using a front-end-loader and transported off site.

All equipment will be properly permitted in accordance with San Diego County APCD requirements. Components of the plant and the conveyors are presented in Table 4.

Table 4. Plant and Conveyor Equipment

No.	Type	Attachments	Size/Length	Horsepower (hp)
1	Feed Hopper - Skid Mounted	42” X 25' Belt Feeder	9' X 14'	25
5	Groundline Conveyor	NA	36” X 825'	50
1	Groundline Conveyor	NA	36” X 375'	30
1	Groundline Conveyor	NA	36” X 200'	25
1	Truss Frame Conveyor	Pit Portable Conveyor, Power Travel, Hopper, Discharge Hopper, Walkway	36” X 130'	40
1	Triple Deck Screen w Blade Mill Support	Urethane Media, Spray Manifold, Dual Motor Drive, Discharge Chutes, Rolling Box, Under Hopper, Walkway on Four Sides, Stairway	8' X 20'	50
1	Blade Mill	NA	44” x 20”	100
2	Fine Material Washer	NA	44” X 32'	50
1	Radial Stacker	Power Travel, Power Raise, Pivot, Hopper	36” X 80'	25
1	Radial Stacker	Power Travel, Manual Raise, Hopper	36” X 100'	30
1	Operations Control Room	Motor Control Center, Push Button Console, Motor Starters, In Plant Cable/Wiring, Air Conditioned	NA	NA

Office and Maintenance

The mobile modular unit used for the scale booth will be combined to serve the site’s administrative needs. Required on-site documents will be housed in this unit. Storage of tools or small equipment will be in metal cargo containers also located at the plant site.

Mobile equipment on the project will be maintained by private vendors. As such, any waste material produced from maintenance activities, such as waste oil, will be removed by the vendor upon leaving the site at the end of the workday.

Maintenance and repairs on the site's mobile mining equipment would be completed on a level area near the active excavation and away from any drainage feature. Ground protection and spill containment, which would include plastic sheeting to line a bermed sump and absorbent pads, would be placed in the work area prior to work being conducted on the equipment to contain leaks or accidental spills from reaching the ground. Available clean up materials will include absorbent pads, pillows, dry absorbent, flat nosed shovel, a broom and a waste container for any clean up materials used. All materials used to clean up a spill will be transported from the site and disposed of at a licensed facility in accordance with State and Federal requirements.

As many as 15 over-the-highway trucks may be parked each day near the processing area and entrance to the site. The processing area will be located west of the existing golf course parking lot.

Mine Personnel
Mining and processing equipment will be on site over the duration of the project. Approximately nine (9) individuals will be employed onsite.

2.6 Waste

All material extracted from the site, not designated as saleable product, will be utilized as backfill to construct the final landform. No tailings or waste piles will remain following conclusion of extractive operations. Domestic refuse shall be collected in trash bins and removed by a licensed, refuse disposal company. Equipment will be maintained on site and all used oils, fuels and solvents collected in accordance with the Department of Toxic Substances Control regulations would be removed from the site by an approved hauler for materials recycling.

2.7 Traffic

Processed and sorted materials would be loaded directly onto over-the-road haul trucks from stockpiles located in the plant area. The loaded trucks would be weighed to comply with state regulations and sprayed with water to minimize dust. Watering of the load would occur at the scales.

Haul trucks will approach the project site from Jamacha Road and Willow Glen Drive. Trucks will enter the project site east of Steele Canyon Road at the access point on Willow Glen Drive and proceed to the processing area over the onsite access road. When not in active service, approximately 15 trucks may be stored onsite in a designated parking area next to the plant. All other trucks will be parked off-site at individual trucking company storage yards, arrive at the site empty, and leave with a full load. Maintenance and repairs of mining and construction equipment would be completed onsite in specified areas with containment and ground protection. During Phase 1 the maintenance area will be located near the proposed concrete access driveway across from Muirfield Drive, which is necessary due to the inability of heavy equipment to be moved on site beneath the bridge over Steele Canyon Road. In the

remaining phases, the maintenance/repair area will be in a designated location near the processing plant.

The maximum annual rate of extraction is expected to be 380,000 cubic yards (570,000 tons). This will result in approximately 1,462 cubic yards (2,192 tons) leaving the site each day. Sand extraction operations would be conducted approximately 260 days per year, on weekdays, between the hours of 7:00 a.m. to 5:00 p.m. Trucking would occur from 9:00 am to 3:30 p.m. during the week. Approximately 88 trucks would enter and exit the site daily to transport saleable material (Table 5). No activities would occur on weekends.

It is conservatively estimated that approximately 10 percent (427,000 cy) of the excavated material would be considered not suitable for processing and thus would be retained on site and utilized for backfilling needs. In addition, approximately 2.5 million cy would be imported to the site to meet the site's overall backfill requirements. The maximum number of truck trips necessary for importing the maximum anticipated amount of backfill material is conservatively estimated to be approximately 58 truck trips per day, over the 10-year operation of the project (Table 5). The actual number of truck trips may be less, where the same truck transporting material to the site would also transfer produced material away from the site ("deadhead trip").

The combined total haul trucks entering and exiting the site daily would be 146 trucks.

Loaded trucks would utilize Willow Glen Drive to Jamacha Road to deliver the construction aggregate to local markets and to bring inert debris to the site. The annual maximum production limit (570,000 tons in any calendar year), as well as seasonal and daily peaking factors, were used to generate conservative (worst-case-scenario) estimates; actual truck trips will be dependent on market conditions.

Truck Trips

Table 5. Daily Truck Trips

End Product	% of Total	Quantity/yr	t/load	Loads/day
Aggregate	60	570,000 tons	25	88
Inert Debris (Backfill)	40	375,000 tons	25	58
Total		945,000 tons		146

* A cubic yard of concrete contains 1.5 tons of aggregate.

Other Vehicle Trips

Table 6. Other Traffic Trips

Trip Type	One-way trips/day	Round Trips/day
Light Vehicle Trips	28	14
Vendor Trips[1]	8	4

[1]Vendor trips include fuel, supplies, service companies, etc.

2.8 Storm Water and Erosion Control

Erosion control for the project will be accomplished through a combination of permanent and temporary structures. Permanent structures include the drop structure to prevent head cutting of the channel during infrequent, high flow events and appropriate slopes, terraces, ditches and down drains where needed. This section addresses temporary erosion control measures that will be used on the active, disturbed areas of the Project.

A Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) will be prepared and submitted to the State Water Resources Board for the project site prior to construction in accordance with the Industrial General Permit Order 2014-0057-DWQ, effective July 1, 2015. It will reflect the conditions expected to be encountered on the project site. Industrial Best Management Practices (BMPs) and post-extraction BMPs will be designed to protect water quality and in compliance with CCR section 3706, the Federal Clean Water Act, and the Porter–Cologne Water Quality Control Act. A copy of the SWPPP will also be maintained at the Project site. The SWPPP will include an erosion control plan prepared per State and/or County guidelines.

The SWPPP and erosion control plan will define best management practices (BMPs) to prevent erosion and the discharge of sediment to surface waters. BMPs will be specified for soil stabilization, sediment control, vehicle track out, and transport of soil by wind (e.g., dust control and wind erosion BMPs). Typical soil stabilization BMPs include preservation of existing vegetation, mulch, hydroseeding, soil binders, geotextiles, lining of drainage ditches and/or velocity control structures if needed. Vehicular track out and dust related BMPs may include paved or stabilized roadway surfaces, tire washes, use of grates at vehicle entrances or exits, soil stabilizers, and water spray. The final plan may incorporate these or additional BMPs as appropriate on the site.

Erosion and sedimentation control measures, at a minimum, will be designed for the 20-year 1-hour storm event in accordance with SMARA guidelines. These measures shall be implemented throughout the project life to control surface runoff and drainage for the protection of surrounding land and water resources. Silt fencing, earthen dikes or other erosion control measures will be installed to ensure the overall direction of flow toward the pit or to small settling basins before entering the channel of the Sweetwater River. These treatments will also be used to control erosion and sedimentation in areas with the potential for offsite transport of sediment. These erosion control measures will be maintained until vegetation becomes established to serve as an effective storm water and erosion control measure.

Slopes will be revegetated with native species common to the Coastal Sage Scrub or Southern Willow Scrub vegetation communities depending on location at the site. Riparian species will be planted on the edges of the river channel. Successful revegetation will minimize the potential for erosion and sedimentation. If necessary, straw wattles or silt fencing will be used on slopes to help control erosion during the revegetation process. All areas disturbed by the project will be revegetated as soon as feasible.

Erosion control measures will be implemented in accordance with the following criteria:

Class 1: No soil loss or erosion; topsoil layer intact; well-dispersed accumulation of litter from past year's growth plus smaller amounts of older litter.

NO ACTION NECESSARY

Class 2: Soil movement slight and difficult to recognize; small deposits of soil in form of fans or cones at end of small gullies or fills, or as accumulations back of plant crowns or behind litter; litter not well dispersed or no accumulation from past year's growth.

ACTION: Monitor to see if any further deterioration and action is required.

Class 3: Soil movement or loss more noticeable; topsoil loss evident, with some plants on pedestals or in hummocks; rill marks evident, poorly dispersed litter and bare spots not protected by litter.

ACTION: Any rills or gullies exceeding 8 square inches in cross sectional area and more than 10 linear feet located on finished slopes shall be arrested using straw mulch and hay bales

Class 4: Soil movement and loss readily recognizable; topsoil remnants with vertical sides and exposed plant roots; roots frequently exposed; litter in relatively small amounts and washed into erosion protected patches.

ACTION: Replant via hydroseeding or spread seed and cover with straw mulch. Regrade, compact with equipment, and install silt fences if necessary.

2.9 Utilities

2.9.1 Water and Wastewater

A water truck is used to water material stockpiles and unpaved areas periodically throughout the day for dust suppression purposes. Other water requirements include surface watering of outgoing loads, dust suppression for the processing equipment, material washing and irrigation. Operational and irrigation water needs at the site will be provided by eight existing, onsite water wells.

Water usage depends on production volume. Production volume will vary year-to-year with market demand; however, the project's estimated consumptive water use assumes the maximum annual production of 570,000 tons. Water usage for the processing operation includes water retention in materials shipped, evaporation and dust control for the project is estimated to be 64 acre-feet annually for this production rate. A single water truck will be required to control dust. Evaporation from potential pit water is 20.3 acre-feet per year assuming a 5-acre pit size. Irrigation of the right of way, the landscaping in the parking area, and revegetation is estimated to utilize approximately 55.6 acre-feet per year. Total water consumption for the project is estimated at 139.9 acre-feet per year including all processing uses, irrigation and pond evaporation. Water for all operational and reclamation purposes will be supplied by onsite groundwater wells.

Eight groundwater wells on the property currently provide irrigation water for the golf courses. These wells will be used to provide water for the operation. Water use estimates for the existing golf club operations based on information provided by the golf course superintendent (Personal Communication, 2019) and the Evapotranspiration (ET) method as described in the Groundwater Sustainability Plan for Borrego Valley (Borrego Valley Groundwater Sustainability Agency, 2019). The estimated annual water usage from well pump data provided by the course superintendent is 840 acre-feet. The estimated annual water usage using the ET method, and including evaporation from course ponds, is 804 acre-feet. Mine operations are estimated to reduce this consumptive use by approximately 80 percent per year. Wells not to be used by the property owner or for groundwater monitoring after mining and reclamation are complete will be properly abandoned. Wells in the mining footprint, or not to be used in the future, will be abandoned as each mining phase is completed in accordance with County requirements and standards. Note the Sweetwater Authority has requested that two wells, Lakes #11 and Ivanhoe #11, remain in place after cessation of mining and reclamation activities so Sweetwater can continue groundwater monitoring in this area of the river. It is the intent of the Project to not remove these two wells unless it is required.

Water used to wash the excavated material at the plant will be retained in a series of connected settling basins near the plant. Two submersible pumps enclosed in a waterproof casing would feed and circulate the wash water. Water used in the washing operation would be continuously reused and recycled. Approximately 70 gpm of water input would be required to make up for consumptive water use on the site.

Sewage Disposal
Mining operations will utilize two portable restrooms provided by a private vendor. One restroom will be placed in the plant area and the second near the excavation area as it moves. The portable restrooms are serviced at appropriate intervals.

Drinking Water
Bottled drinking water will be provided by a private vendor.

2.9.2 Electricity and Telephone

Electrical power required for mining and processing operations will be provided by San Diego Gas & Electric through existing overhead transmission lines that will enter the site from the northwest. The project will utilize temporary power poles for the plant location and conveyor system. SDG&E easements will remain in place after the project is complete.

During each phase, it may be necessary to remove the existing power distribution poles that cross the golf course. Relocation or removal of power poles would be completed in accordance with San Diego Gas & Electric (SDG&E) requirements. As mentioned, a number of power distribution poles and transmission towers will remain in place and protected according to SDG&E encroachment guidelines and communications with SDG&E staff.

Telephone service will be provided by cellular service.

2.9.3 Fire and Law Enforcement Services

A fire station operated by the San Miguel Fire Protection District is located at 11501 Via Rancho San Diego, El Cajon, CA 92019 which is approximately 1.6 miles from the main access point of the project. In addition, the San Diego headquarters of Cal Fire is located 1.4 miles from the project entrance. Access to the site for both fire stations is provided by Jamacha Blvd and Willow Glen Drive.

Law enforcement services are provided by the San Diego County Sheriff's Department from the Rancho San Diego substation located at 11486 Campo Rd near the junction of Jamacha Road and Campo Road and approximately 2.4 miles from the site.

2.9.4 Equipment Fuel

Diesel will be delivered to the site daily by a private supplier to fill the onsite equipment. If gasoline is needed on the site for small tools, it will be contained in approved, five-gallon fuel cans with a maximum of 10 gallons stored at the site at any time. These gas cans will be stored in a locked container away from flammable materials. Small trucks and passenger vehicles will utilize local commercial stations for fuel. No other fuel will be stored on the site.

2.10 Safety and Security

Fencing (4-strand barbed wire) will be installed along the exterior edges of the project except along Willow Glen Drive. Chain-link fencing will be placed along Willow Glen Drive. Signage will be placed along the fence at appropriate intervals warning the public of hazards and restricted access.

Gates will be installed at the ingress/egress roads to restrict public vehicular access. These gates will be closed and locked during periods of non-operation. Signs will be posted at the entrance identifying the name of the operation, permit number and emergency contact information. The site will be patrolled on a regular basis to discourage trespass. Fire Department locks will be placed on all gates.

3.0 Reclamation and Revegetation

The Reclamation Plan describes reclamation of the extraction area and sets forth standards to assure adequacy of the plan measures. Attachment A - Plot Plan shows the proposed reclaimed landform that would be developed upon resource depletion and final backfilling. Approval of the plan will result in most resources being extracted; thus, it is possible future mining will not be economic or feasible.

The goals of this Reclamation Plan are to:

1. Maximize the recovery of aggregate in a safe and efficient manner.
2. Return extracted areas to a useful purpose following depletion of natural mineral resource.
3. Restore vegetation with the use of native species.
4. Mitigate, by design, potential environmental impacts on the land that might otherwise be created by extraction.

Resource extraction will lower the existing elevation of the golf course area by approximately 15 to 20 feet. Slopes, at maximum 3H:1V overall, will constitute the

perimeters of the channel. Following completion of the mining and reclamation activities, the area disturbed by mining will be revegetated and reclaimed including recreational trails.

Reclamation will be completed for each sub-phase after the completion of mining in that specific area. For example, as mining progresses from sub-phase 1-A area into subphase 1-B area, final reclamation will begin in the sub-phase 1-A area. Final landforms will be developed, topsoil spread over the surface and the area planted with the native species identified in the Revegetation Plan. This procedure will result in approximately 75 to 80 percent of the disturbed lands being reclaimed by the time extractive operations are complete.

Reclamation is expected to continue for up to 2 years after the cessation of mining. Work completed during this period will include backfilling to grade, removal of all processing equipment, final grading, removal of roads, preparation of seed beds and planting. Weed control will continue after planting. Monitoring of the revegetation effort and areas will continue until performance standards are met. Erosion and sediment control will also be monitored and repaired if necessary.

The final landform will be a relatively flat plain that gently slopes downward from east to west. A deepened floodway will bisect the length of the site. Banks of the floodway will slope up to the plain surface at a 3H:1V ratio or shallower. The elevation difference between the bottom of the river channel and the top of the slope may be up to 25 feet. The deepened floodway is expected to average approximately 250 to 300 feet in width and would be slightly higher in elevation than the existing low-flow channel. This low-flow channel would accommodate annual water transfers from Loveland Reservoir to Sweetwater Reservoir. In some areas, small benches may be constructed on the face of the riverbanks to accommodate vegetation types and/or recreational trails.

3.1 Slope Grading & Compaction

All slopes will be cut from native materials in compliance with geotechnical recommendations (see attached Geotechnical Report, Attachment C). All slopes will be continuously developed as the pit progresses eastward using wash fines and backfill material incorporated with topsoil as a cover material. All slopes will be at a 3H:1V gradient or shallower (see Figure 3.1-1). The pad surfaces will slope gently towards the river channel.

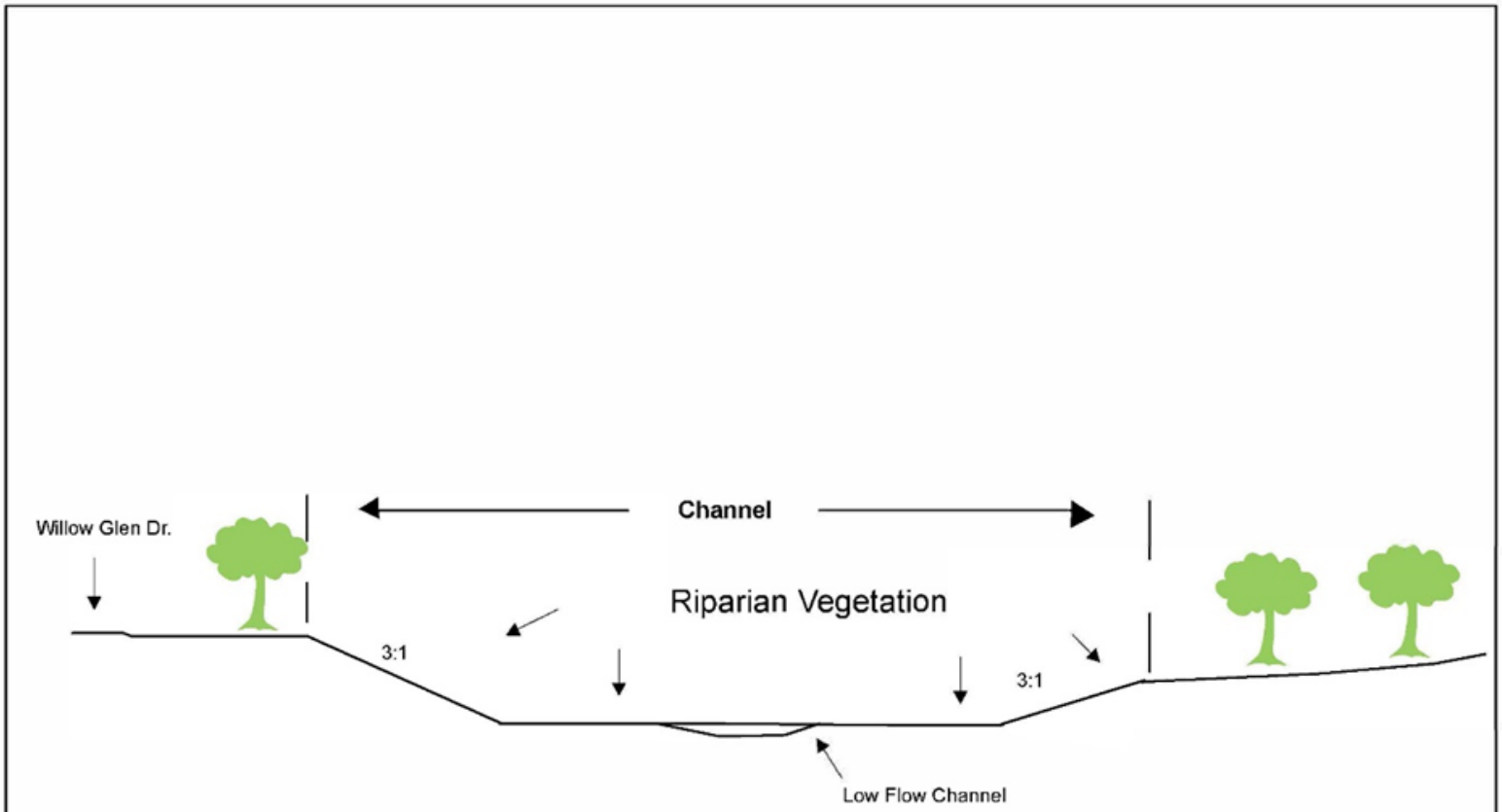
All final slopes will be reclaimed to a maximum 3H:1V gradient. Brow ditches and berms will be placed at the top of the slopes to prevent slope erosion. Appropriate erosion control materials will be installed, and drainage established. Disturbed land to be reclaimed, including roads will be approximately 214 acres. Based on the geotechnical study conducted for the site, all final, slopes will have a factor of safety in excess of 1.5 for both static and pseudostatic conditions. (Attachment C).

The onsite materials, sand production by-products, and imported inert debris should provide adequate quality fill material provided they are free from organic matter and other deleterious materials. Fill should be inorganic, non-expansive granular soils.

Fill will be spread in near-horizontal layers, approximately 8 inches thick. Thicker lifts may be approved by the geotechnical engineer if compaction testing indicates that the grading procedures are adequate to achieve the required compaction. Each lift will be spread evenly, thoroughly mixed during spreading to attain uniformity of the material and moisture in each layer, brought to near optimum moisture content and compacted to a minimum relative compaction of 85 percent in the floodway and up to 90 percent in upland areas.in accordance with ASTM D1557 or as approved by the geotechnical engineer.

The final slopes will also be track-walked to create depressions for erosion control and water retention. Disturbed areas will be seeded annually during the rainy season as final slope areas become available for hydroseeding or planting. If necessary, over-compaction of the surface soil will be relieved by ripper, disc and/or scarified to provide a suitable root zone for plant growth.

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EnviroMINE Inc.

February, 2020

Figure 3.3-1
Cottonwood Sand Mine
Reclaimed Slope Design

3.2 Roads

Access to the extraction area will be through a new entrance from Willow Glen Drive located approximately 0.25 miles east of the intersection of Willow Glen Drive with Steele Canyon Road. The new access point is located approximately 0.25 miles west of the golf course parking lot in the north central part of the extraction area and will be retained for post-mining use. This road would continue to a new egress point in the approximate center of the existing parking lot (See Sheet 3, Plot Plan). The project proposes to also construct a two-way left-turn lane between the Project ingress and egress driveways, which would serve as a refuge lane for trucks to complete their outbound maneuver as they are exiting the site. A second, egress point from Willow Glen Drive will be installed approximately 0.4 miles west of the Willow Glen Drive and Steel Canyon Road intersection as shown on the Plot Plan. This access point will be constructed directly across from Muirfield Drive and consist of a concrete apron that will convert to gravel surface for a short distance on the property. All onsite roads, except a San Diego Gas and Electric maintenance access road, will be stripped of road base materials if needed, covered with 6-inches of topsoil or wash fines, ripped to relieve compaction, and revegetated by hydroseeding with the appropriate seed mix.

3.3 Removal of Equipment

All structures and equipment used in the operation will be removed from the site prior to final reclamation. This includes all loaders, bulldozers, haul trucks, storage containers, water trucks, and processing equipment. The truck scales and office trailer will be removed. Surplus equipment and supplies stored onsite will be transported off-site. Asphalt will be removed from most of the parking lot with a small parking area left in place near the entrance for use during reclamation monitoring and by the property owner for access. Gates to the property will remain in place. All trash, asphalt and miscellaneous debris will be collected and hauled to an appropriate waste disposal facility.

All existing hazardous materials located onsite shall be disposed of, and transported, in accordance with all applicable regulations/ordinances. Any wells located on the property that are not retained by the property owner shall be abandoned under permit and inspection by San Diego County Department of Environmental Health.

3.4 SMARA Revegetation

The objective of revegetation discussed in this plan is to provide vegetative cover for disturbance created by extractive operations, controlling erosion, and stabilizing slopes. Revegetation for restoration is provided in the Conceptual Revegetation Plan (Attachment B) as part of this Reclamation Plan. Plant materials to be used are capable of self-regeneration without continued dependence on irrigation, soil amendments or fertilizer.

Revegetation will be enough to stabilize the surface against the effects of long-term erosion and is designed to meet the post-extraction land use objectives of the site. Native species will be used for all revegetated areas to establish vegetative cover and are designed to meet the variety of physical characteristics present. An erosion control seed mix will be used for the flat or gently sloped areas. Revegetation plant palettes,

including container stock and seed mixes, for the RP area are presented in Attachment B. Revegetation Plan.

A list of the Revegetation Plan plant palettes are as follows:

- Riparian Scrub/Forest Rehabilitation Plant Palette – 7.36 acres
- Riparian Forest Plant Palette – 15.39 acres
- Riparian Scrub Plant Palette – 84.84 Acres
- Streambed (Emergent Wetland) Seed Mix - 9.94 Acres
- Diegan Coastal Sage Scrub (DCSS) Plant Palette - 11.92 Acres
- Erosion Control Seed Mix – 97.90 acres

Revegetation will be conducted on the entire area disturbed by the mining activities. Prior to seeding, materials utilized as final cover will be analyzed to determine the presence of elements essential for plant growth. If the soils analysis shows that fertility levels or soil constituents are inadequate to successfully implement the revegetation program, amendments may be incorporated into the soil through hand planting, sowing and/or hydroseeding. Wire cages will be installed as necessary to protect plants from herbivore damage, if necessary.

A discussion of the methods to be used and locations to be planted with specific species are presented in the Revegetation Plan, Attachment B.

The flat or gently sloped areas outside of the riparian corridor will be hydroseeded with an erosion control mix to aid in soil stabilization and control erosion.

Container plants will be planted by hand. Seed mixes described above will be applied using mechanical hydroseeding methods or hand sown. Hydroseeding is the hydraulic application of a homogeneous slurry mixture consisting of water, seed mix, cellulose fiber and a binding agent such as "M" Binder. Fertilizer can be added if the soil analysis shows the need for addition of amendments; however, native plant communities do not tend to benefit from the use of fertilizer and can result in excessive weed infestations. As such, the use of fertilizer is not anticipated.

The hydroseed mixture shall consist of the following materials:

- 2,000 lbs./acre cellulose fiber
- 140 lbs./acre "M" Binder (tackifier)
- 200 lbs./acre Milogranite (fertilizer if required)
- Seed mix as listed.

Hydroseeding application shall be performed only at times when winds are relatively calm between November and February. These months are also selected to take advantage of the natural wet season of Southern California. This planting period may be extended due to the use of irrigation.

3.5 Irrigation

To assist with the propagation of reclamation revegetation, irrigation of reclaimed lands will be used over the first two years after planting to augment natural

precipitation. An irrigation plan for the reclaimed area will be developed in accordance with recommendations of the Project Landscape Architect and will be submitted to the County for approval prior to implementation. Watering will only occur to assist in establishment and/or in long periods of extended dryness. Irrigation will not be used continuously after seeding. Water from existing water wells will be utilized for irrigation. Irrigation will be completed in compliance with County's Water Conservation in Landscaping Ordinance. Evidence shall be provided demonstrating that revegetation is self-sustaining without irrigation for two years prior to the release of financial assurances.

3.6 Interim Seeding

Where final landforms have been established but are not available for final reclamation for greater than 8 months, erosion control will be provided through revegetation with a general erosion control seed mix. The application of the seed mix will be completed on an as-needed basis to control erosion and weed propagation.

3.7 Timing

Seeding shall be performed and completed generally between November 1 and February 15, although irrigation may extend these dates. All efforts will be made to plant during this time since beneficial temperatures and anticipated rainfall will aid in germination, establishment, and growth of target species.

3.8 SMARA Revegetation Performance Standards

Following seeding and before release of financial assurance, the revegetated areas must meet performance criteria. For this site, the most meaningful performance criteria for erosion control and visual mitigation are based on vegetative cover and species-richness. Native habitat within the southwestern portion of the site was used as a reference site for the riparian forest and scrub habitats as well as the DCSS habitat. Revegetation goals and success criteria presented in this plan have been based on visual estimates of native cover noted in the reference site during biological surveys conducted for the biological technical report (HELIX Environmental Planning, 2024). Comparison with off-site reference areas will be completed for the channel vegetation as this segment of the revegetation project consists of common native plant species and habitats whose parameters are established in the area. Elevated areas of the project where erosion control mixes will be used for revegetation will have separate success criteria that is suitable for erosion control. While it is expected that the revegetated slopes will have benefit to wildlife, the revegetation efforts within this plan are not intended to meet natural habitat performance standards. Habitat restoration and mitigation are presented in the Conceptual Revegetation Plan. The performance standards are presented in Table 8.

Table 8. Revegetation Performance Standards

Vegetative Cover (m: meters)	Species Composition / Species Richness	Percent Cover	Density
Seed Mixes (excluding Erosion Control Seed Mix)	Target Goal: 100% of the most prevalent species shall be native species. 12 randomly placed 50 - meter by 1-meter transects.	Target Goal: 50% cover (all native species combined) 12 randomly placed 50 - meter by 1-meter transects.	N/A
Erosion Control Seed Mix	Target Goal: 4 native perennial species per 10 x 10 meter plot.	Target Goal: 40% of area covered per 10 x 10 meter plot.	Target Goal: 1 – 2 native perennial stems per square meter plot.
Container Stock	Target Goal: 5 tree species 12 randomly placed 50-meter by 1-meter transects	N/A	Target Goal: 30 total trees per acre (80% survival) 12 randomly placed 50-meter by 1-meter transects

Revegetated areas will be monitored once per year to compare the actual revegetation success rates with the success criteria.

Since revegetation will occur concurrently with extractive operations, revegetation practices will be continually evaluated as revegetation is completed throughout the site. Records shall be kept of soil preparation, including the addition of amendments as determined to be necessary, seeding techniques and erosion control measures.

Revegetated areas shall be identified on a map and tested to assure that standards are adequately achieved to within a minimum of 80 percent confidence interval. Annual monitoring reports will be submitted to the County until the approved success criteria have been met and approved by the County. When the County agrees that revegetated areas meet success criteria for two consecutive years, no further monitoring will be required, and the operator may apply for release of financial assurances.

3.9 Test Plots Locations and Treatment

Two test plot areas will be placed in the Phase 1 area of the project. The first should be located at a lower elevation in an area of riparian plantings and second at a higher elevation that encompasses coastal sage scrub/upland plantings. Location of each test plot will be established by the Revegetation Specialist. Test plots will help to ensure successful implementation of the revegetation plan. The lead agency may waive any requirement to conduct test plots when the success of the proposed revegetation plan can be documented from experience with similar species and conditions or by relying on competent professional advice based on experience with the species to be planted.

Success of these test plots shall be judged based upon the effectiveness of the vegetation for the approved end use, and by comparing the quantified measures of

vegetative cover, density, and species richness of the reclaimed mined lands to the surrounding area. Comparisons will be made by a qualified individual until performance standards have been met.

3.10 Weed Control

Primary weed species to be addressed in weed control efforts include Giant Reed, Arundo (*Arundo donax),* Mustard (*Brassica sp.),* Ripgut Brome *(Bromus diandrus),* Cheat Grass, Downy Brome *(Bromus tectorum),* Pampas Grass *(Cortaderia spp.),* Eucalyptus *(Eucalyptus spp.),* Pepperweed *(Lepidium latifolium),* Tree Tobacco *(Nicotiana glauca),* Castor Bean *(Ricinus communis),* Russian Thistle, *Tumbleweed (Salsola tragus),* and Tamarisk *(Tamarix spp.)*

After startup, the project site will be monitored periodically by means of visual observation to identify the potential for uncontrolled weed propagation. Should weed control be necessary, the operator will hire the services of a biologist or agriculturalist to make recommendations for the control of noxious weeds that may invade the project area. The operator and/or a contract vendor will carry out treatments recommended to eradicate the undesired vegetation. All vegetative debris resulting from the weed maintenance program will be removed from the property and disposed of properly.

3.11 Post Extraction Land Use

Upon completion of resource extraction, the extraction area site will be reclaimed to uses allowed under the General Plan and County Zoning Ordinance including recreational trails. After reclamation is complete and financial assurances mechanisms released, other uses will require separate entitlements. Reclamation of the site will be considered complete when revegetation standards are met on the areas disturbed by the mining operation.

3.12 Post Extraction Drainage and Erosion Control

Small de-siltation basins may be constructed at the bottom of slopes to capture sediment and avoid potential off-site impacts. In addition, silt fences, straw waddles geotextiles or lined drains may be installed as BMPs during the revegetation process. Erosion control measures will be designed for the 20-year 1-hour storm intensity event. These measures will be implemented to control surface runoff and drainage to protect surrounding land and water resources. Silt fences or other temporary erosion control devices will be removed from the site after vegetation has been established.

Slope rounding will be used along the top of slopes to prevent runoff from flowing from flat areas onto slopes. Gently sloped areas will be graded at approximately 1 percent slope to minimize the potential for erosion and sediment transport. Additional erosion and sediment controls will be implemented around work areas as mining progresses.

3.13 Post-Extraction Public Safety

No mining equipment, tailings, waste piles, refuse or dangerous material will remain onsite. Vehicular access onto the property will be blocked by locked gates at all access points onto the property. Where appropriate, during mining and reclamation the site will be protected from intruder access by fencing and warning signs posted to restrict unlawful access. Fencing will consist of a four-strand barbed wire chain link in

certain areas. Security fencing will be removed after reclamation is complete at the owner's request. Fencing shall be consistent with any required County or other oversight agency guidelines.

3.14 Effect of Reclamation on Future Recovery of Mineral Resources

Extractive operations will recover unrestricted, economically recoverable resources within the project footprint. As a result, reclamation will have no effect on future mineral resource recovery if it becomes economical.

3.15 Reclamation Monitoring and Maintenance

Reclamation and post-reclamation efforts will be monitored pursuant to SMARA requirements and according to the approved Revegetation Plan. Data for cover, density, and species richness will be collected along 12 randomly placed 50-meter by 1-meter transects. The operator will be required, under SMARA (Public Resources Code §2207), to submit an annual status report on forms provided by the Department of Conservation and directs the lead agency to conduct an inspection of the operations within six months of receipt of the required Annual Report. Revegetation monitoring will continue for a minimum of 5 years per County requirements or until performance standards are met.

4.0 Financial Assurances

In addition to annual monitoring, all SMARA regulated sites are required to provide financial assurances. The financial assurances are required to ensure that the site can be reclaimed, should the operator default on this obligation. The financial assurances may be in the form of surety bonds, irrevocable letter of credit, trust funds, or other forms of financial assurances approved by the Lead Agency. The amount of the financial assurance is reviewed annually by the Lead Agency to determine the adequacy for completing reclamation.

5.0 Compliance with Reclamation Standards

5.1 Purpose

The Surface Mining and Reclamation Act requires that all newly approved Reclamation Plans incorporate verifiable standards to assure adequate completion of Reclamation Plan objectives. The verifiable standards were adopted by the State Board of Mining and Geology as regulations to implement these requirements. These regulations are known as the "Reclamation Standards" (PRC Article 9, Sections 3700 *et seq.*). The following discussion addresses compliance with these standards as outlined in the Reclamation Plan for the Cottonwood Sand Mine dated October 2018.

5.2 Financial Assurances (§3702)

The project is required to provide financial assurances to ensure reclamation is performed in accordance with the reclamation plan. Financial assurances are reviewed annually by the lead agency and adjusted, as necessary.

5.3 Wildlife Habitat (§3703)

Two federal and state listed species, coastal California gnatcatcher (federally listed as threatened) and least Bell's vireo (federally and state listed endangered) were identified onsite during focused species surveys. USFWS-designated critical habitat for the

coastal California gnatcatcher, least Bell's vireo, and federal listed endangered San Diego ambrosia is present in the southwestern portion of the project site, and critical habitat for the federal and state listed endangered southwestern willow flycatcher occurs off-site to the west. The project would not result in impacts to southwestern willow flycatcher critical habitat, but would result in minor impacts to San Diego ambrosia, coastal California gnatcatcher, and least Bell's vireo critical habitat. The small portions of critical habitat that would be impacted primarily consist of disturbed habitat associated with the golf course development that do not support habitat for these species, and the small amounts of riparian and wetland habitat (0.26 acre of riparian forest, 0.01 acre tamarisk scrub, and 0.02 acre of freshwater marsh) that would be impacted are located at the edge of the riparian habitat that would be restored to riparian habitat following project activities as part of site reclamation and the project's proposed mitigation. As part of the reclamation process, the project would preserve, enhance, rehabilitate, and restore habitat through the widening and revegetation of the Sweetwater River channel and placement within open space such that no net loss of sensitive natural communities or riparian habitat would occur. No in-stream mining is planned, however; mining shall not cause fish to be trapped in pools or off-channel pits or restrict migratory or spawning activities. The project would implement breeding season avoidance and/or pre-construction surveys to avoid direct and indirect impacts to sensitive birds and raptors.

5.4 Backfilling, Regrading, Slope Stability, and Recontouring (§3704)

The reclamation plan calls for continued resource extraction and reclamation over an area of about 214 acres; and will result in the creation of nearly level areas and maximum slopes of 3H:1V. All cut and fill slopes shall have a minimum slope stability factor of safety that is suitable for the proposed end use and conforms to the surrounding topography. All reclaimed slopes shall follow the recommendations of the geotechnical report (See Attachment C, Soil and Geologic Reconnaissance). Areas within the reclamation boundary will be backfilled to specific elevations as shown on the Plot Plan to achieve final, reclaimed contours.

5.5 Revegetation (§3705)

The objective of revegetation is to provide vegetative cover on final slopes that will visually integrate the site with surrounding areas and stabilize the site against erosion and sedimentation. Surfaces will be ripped or disced to relieve compaction. Native plant species will be used for revegetation. Section 3.4 of this Reclamation Plan sets forth planting and maintenance practices, as well as verifiable monitoring standards to assure vegetative success. Examples of maintenance practices and verifiable monitoring standards include, but are not limited to managing noxious weeds, irrigation for establishment purposes, planting during appropriate seasons, planting methods, soil fertility analysis. Test plots are required to assist with determination of successful revegetation measures.

5.6 Drainage, Diversion Structures, Waterways, and Erosion Control (§3706)

The quality of water, recharge potential, and storage capacity of groundwater aquifers is not expected to be diminished because of reclamation of this extraction operation (GeoLogics & Assoc, 2020). Operational erosion control methods are designed in compliance with storm water regulations. Erosion and sedimentation control will be implemented during all phases of operations, according to the Drainage Report. Per

Industrial General Permit Order 2014-0057-DWQ Effective July 1, 2015 requirements an NOI will be filed, a SWPPP prepared and BMPs implemented to mitigate erosion and sediment transport.

5.7 Prime Agricultural Land Reclamation (§3707)

Not applicable. The land is mapped as Urban and Built-Up Land by the California Department of Conservation.

5.8 Other Agricultural Land (§3708)

The property has been used as golf courses for more than 55 years. Prior to golf course use the site was a dry wash. Very heavy irrigation would be required for any agriculture due to the porosity of the soil materials at the site. In addition, land in the area has been developed or is in the process of being developed. The RP area is not located on lands that are currently under a Williamson Contract agreement.

5.9 Building, Structure and Equipment Removal (§3709)

All structures and equipment (mobile, portable, and fixed) will be removed from the plan area except as demonstrated to be necessary for the proposed end use by the property owner following reclamation.

5.10 Stream Protection, Including Surface and Groundwater (§3710)

Mining and reclamation activities include storm water protection measures to eliminate the potential for erosion and sedimentation discharges off-site. These measures are compliant with appropriate sections of the Federal Clean Water Act, Porter-Cologne Act, the California Regional Water Quality Control Board, and the San Diego County Watershed Protection Ordinance (WPO) No. 10410. The revegetation practices outlined in Section 3.4 of this Reclamation Plan identify measures to establish a self-regenerating vegetative complex that is designed to control erosion and sedimentation. In addition to these plan measures, the Lead Agency would conduct annual inspections to ensure implementation of these water quality protection measures.

Unavoidable impacts would occur to riparian and wetland habitat as part of proposed project activities, including the widening of the Sweetwater River channel, which would be subsequently planted with native riparian vegetation along the channel bottom, and coastal sage scrub on slopes bordering the channel. These areas support jurisdictional waters and wetlands. Impacts to jurisdictional waters and wetlands would require compensatory mitigation ratio. The proposed mitigation ratios are consistent with County guidelines and those that would be required by the wetland permitting agencies (USACE, RWQCB, CDFW), though final mitigation requirements for impacts to jurisdictional waters and wetlands would be determined during the permitting process. Generally, these range from 1:1 to 3:1, with wetlands requiring at least a 1:1 on-site establishment/re-establishment component. The project would impact 3.70 acres of wetland and 0.34 acre of non-wetland waters of the U.S. and 21.83 acres of wetlands and waters under CDFW jurisdiction.

5.11 Topsoil Management (§3711)

Topsoil will be salvaged to aid in reclamation. It is expected that topsoil will be stripped in advance of the pit and directly placed on previously disturbed surfaces

immediately prior to revegetation. This will limit damage to soil structure and preserve soil biological processes. Topsoil stockpiles will be clearly identified with signage.

5.12 Tailing and Extraction Waste Management (§3712)

Extracted material not transported off-site will be used as backfill. No stockpiles will be left on site post reclamation. Mine waste and tailings and mine waste disposal units are governed by SWRCB waste disposal regulations and shall be reclaimed in accordance with CCR Article 1. Surface Mining and Reclamation Practice. Section 3500 et seq." and "All waste shall be disposed of in accordance with State and local health and safety ordinances."

5.13 Closure of Surface Openings (§3713)

Not Applicable.

5.14 Public Safety

Public health and safety are protected in accordance with County standards for open space. Access is controlled by fencing and with locked gates at all access points to the property.

5.15 Administrative Contacts

Lead Agency Information:

Lead Agency:	County of San Diego,
Staff Contact:	Mr. Christopher Jacobs
Address:	5510 Overland Ave, 3rd Floor, San Diego, CA 92123
Telephone:	(619) 323-8718

6.0 Project Summary

A summary of pertinent details for the Project is presented in Table 9 as follows:

Table 9. Project Summary

General Site Information	
Applicant	Cottonwood Mine
Project Proponent	Cottonwood Cajon ES, LLC.
Property Owner (s)	Cottonwood Cajon ES, LLC.
Project APN's	506-021-1900, 506-020-5200, 518-012-1300, 518-012-1400, 518-030-0500, 518-030-0600, 518-030-0700, 518-030-0800, 518-030-1000, 518-030-1200, 518-030-1300, 518-030-1500, 518-030-2100, 518-030-2200, 519-010-1500, 519-010-1700, 519-010-2000, 519-010-2100, 519-010-3300, 519-010-3400, 519-011-3700, 519-011-0700
Surface Elevation	Approximately 334' on the west to 378' AMSL on the east.
General Plan Designation	Open Space (Recreational)
Zoning	S80 - Open Space; S88 - Specific Planning Area; S90 - Holding Area
Williamson Act Contract	No
MRZ Designation	MRZ- 2 (CGS Special Report 240, 2017)
Current Land Use	Golf Courses - Recreational
Major Use Permit Boundary	251.1 acres
Reclamation Plan Boundary	214.4 acres
Additional Permits	Air Permits, Haul Truck Plans, Traffic Control Permits, Right-of-Way Encroachment Permits, Major Use Permit, Industrial General Permit, Construction General Stormwater Permit, Public Improvement Plan Permit, CLOMR/FEMA approval, Inert Debris Engineered Fill Operation, Resource Agency Permits 404/401 and 1602 permits
Mining	
Mining Area	Estimated 214.4 acres within the existing golf course footprint
Setback Limit	50 feet from property boundary, 100 feet from residential
Maximum Mining Depth	West: 295 feet. East:354 feet AMSL (approximately 40' below existing ground surface)
Approx. Groundwater Elevation (range)	Approximately, 310 (west end) to 354 feet (east end) AMSL.
Mining Slopes	3H:1V (horizontal: vertical) maximum
Type of Minerals	Alluvium
Maximum Total Production	3.8 million cu.yds. (5.7-million tons)
Maximum Annual Production	570 thousand tons
Commencement of Mining	Within 1 Year After Permit Approval
Duration of Project	12 years (10 years of extraction and reclamation with 2 years for final reclamation after cessation of extraction)
Mining Permit Expiration	12 years after approval date.
Reclamation	
Revegetated Area	Approximately 214.4 acres
Duration of Reclamation	Continuous starting in year 2 and extending 2 Years after cessation of mining.

Completion of Reclamation	2037 estimated
Post Mining Land-Uses	Land suitable for uses allowed by the General Plan and existing zoning.

7.0 Statement of Responsibility

I, the undersigned, hereby agree to accept full responsibility for reclamation of all mined lands as described and submitted herein and in conformance with the applicable requirements of Articles 1 and 9 (commencing with Sections 3500 et seq. and 3700 et seq., respectively) of Chapter 8 of Division 2 of Title 14 of the California Code of Regulations, the Surface Mining and Reclamation Act commencing with Section 2710 et seq., and with any modifications requested by the administering agency as conditions of approval.

Cottonwood Cajon ES, LLC:

Signature: _____

Title: _____

Date: _____

(final version of the Reclamation Plan will be signed)

8.0 References

Borrego Valley Groundwater Sustainability Agency. 2019. Draft Final Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin.

California Geological Survey (CGS), 2017. Special Report 240 - Update of Mineral Land Classification: Portland Cement Concrete-Grade Aggregate in The Western San Diego County Production-Consumption Region, California. Authors: Gius, F.W., Busch, L.L. and Miller, R.V. (PG 3331)

California Regional Water Quality Control Board. 1994. Water Quality Control Plan for The San Diego Basin (9). Authors: Barker, D.T., Schwall, K.T. and Pardy, L.L.
GeoCon, Inc. 2019 (revised 2020). Soil and Geologic Reconnaissance, Cottonwood Golf Course. El Cajon, California.

Geo-Logic Associates. 2020. Groundwater Investigation Report, Cottonwood Sand Mine, Jamacha, California. November.

HELIX Environmental Planning. 2024. Biological Technical Report for The Cottonwood Sand Mine Project. July.

Personal Communication. 2019. Conversation with Mr. Javier Ruiz, Cottonwood Golf Club Superintendent.

Tan, S. S. (2002a). Geology of the El Cajon 7.5' Quadrangle, San Diego County, California, 1:24,000 scale

Tan, S. S. (2002b). Geologic Map of the Jamul Mountains 7.5' Quadrangle, San Diego County, California, 1:24,000 scale

USDA. 1973, Soil Survey San Diego Area, California. Soil Conservation Service and Forest Service. Author: Bowman, R.H.

Attachment A.

Plot Plan

GRADING NOTES

1. THE ENGINEER OF WORK WILL NOT ENFORCE SAFETY MEASURES OR REGULATIONS. THE OWNER SHALL DESIGN, CONSTRUCT AND MAINTAIN ALL SAFETY DEVICES, AND SHALL BE SOLELY RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE AND FEDERAL SAFETY AND HEALTH STANDARDS, LAWS AND REGULATIONS.

2. APPROVAL OF THESE PLANS DOES NOT CONSTITUTE APPROVAL OF VERTICAL OR HORIZONTAL ALIGNMENT OF ANY PRIVATE ROAD SHOWN HEREON FOR COUNTY ROAD PURPOSES.

3. A CONSTRUCTION, EXCAVATION OR ENCROACHMENT PERMIT FROM THE DIRECTOR OF PUBLIC WORKS WILL BE REQUIRED FOR ANY WORK IN THE COUNTY RIGHT-OF-WAY.

4. THE CONTRACTOR SHALL VERIFY THE EXISTENCE AND LOCATION OF ALL UTILITIES BEFORE COMMENCING WORK. NOTICE OF THE PROPOSED WORK SHALL BE GIVEN TO THE FOLLOWING AGENCIES.

UNDERGROUND SERVICE ALERT:	(800) 422-4133
SAN DIEGO GAS AND ELECTRIC:	(800) 227-2600
COX CABLE TV	(866) 272-5777
OTAY WATER DISTRICT	(619) 670-2222
SEWER	COUNTY OF SAN DIEGO - HHSA

5. PROTECTION OF EXISTING UTILITIES:

   THE OWNER IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. ANY PAVEMENT OR OTHER EXISTING SURFACE IMPROVEMENTS DAMAGED BY THE OWNER SHALL BE REPLACED AS REQUIRED BY THE COUNTY OF SAN DIEGO ENGINEERING DEPARTMENT. EXISTING UTILITIES SHOWN HEREON ARE PLOTTED FROM RECORD DATA AND MAY NOT NECESSARILY BE WHERE SHOWN. IT IS THE OWNER'S RESPONSIBILITY TO DETERMINE LOCATION PRIOR TO CONSTRUCTION.

   CAUTION: ENERGIZED OVERHEAD CONDUCTORS, ELEVATION VARIES, MUST MAINTAIN 20' RADIAL CLEARANCE, STANDBY LINEMAN IS REQUIRED FOR SAFETY WATCH FOR THE PROPOSED SAND MINING PROJECT COTTONWOOD. PROTECT IN PLACE EXISTING LATTICE TOWERS, POLES, GUY WIRES & ANCHORS FOR THE PROPOSED SAND MINING PROJECT COTTONWOOD PROJECT. CONTACT DIVERSIFIED UTILITY SERVICES INC. (858-278-2880) 30 DAYS IN ADVANCE OF CONSTRUCTION TO SCHEDULE STANDBY.

6. CAUTION: ENERGIZED OVERHEAD CONDUCTORS, ELEVATION VARIES, MUST MAINTAIN 20' RADIAL CLEARANCE, STANDBY LINEMAN IS REQUIRED FOR SAFETY WATCH FOR THE PROPOSED SAND MINING PROJECT COTTONWOOD. PROTECT IN PLACE EXISTING LATTICE TOWERS, POLES, GUY WIRES & ANCHORS FOR THE PROPOSED SAND MINING PROJECT COTTONWOOD PROJECT. CONTACT DIVERSIFIED UTILITY SERVICES INC. (858-278-2880) 30 DAYS IN ADVANCE OF CONSTRUCTION TO SCHEDULE STANDBY. NO GRADING WITHIN 20' OF EXISTING STEEL LATTICE TOWER FOUNDATIONS & NO GRADING WITHIN 30' OF EXISTING STEEL POLE FOUNDATION.

7. GENERAL UTILITY NOTES EXPLORATORY EXCAVATION REQUIRED: OWNER WILL MAKE EXPLORATORY EXCAVATIONS AND LOCATE EXISTING UNDERGROUND FACILITIES SUFFICIENTLY AHEAD OF EXCAVATION TO PREVENT DAMAGE TO SAID UTILITIES. ALL EXISTING UTILITIES WITHIN THE SITE, AND THOSE ADJACENT TO THE SITE WHICH ARE AFFECTED BY THE WORK PROPOSED TO BE DONE ARE SHOWN ON THIS PLAN. THE UTILITY COMPANIES HAVE REVIEWED THESE PLANS AND ARE SATISFIED WITH THE ARRANGEMENTS MADE BY THE PERMITEE TO PROTECT OR RELOCATE THE UTILITIES.

8. EXISTING UTILITIES OR STRUCTURES ARE SHOWN ACCORDING TO THE RECORDS OF THE ABOVE COMPANIES AND HAVE BEEN EXAMINED TO VERIFY THAT THEY OWN NO UTILITIES OR STRUCTURES WHICH WILL BE AFFECTED BY THE PROPOSED GRADING.

9. ALL OPERATIONS CONDUCTED ON THE PREMISES, INCLUDING THE WARMING UP, REPAIR, ARRIVAL, DEPARTURE OR RUNNING OF TRUCKS, EARTHMOVING EQUIPMENT, CONSTRUCTION EQUIPMENT AND ANY OTHER ASSOCIATED GRADING EQUIPMENT SHALL BE ACCORDING TO THE PERIOD SPECIFIED IN THE MAJOR USE PERMIT.

10. ALL MAJOR SLOPES SHALL BE ROUNDED INTO EXISTING TERRAIN TO PRODUCE A CONTOURED TRANSITION FROM CUT OR FILL FACES TO NATURAL GROUND AND ABUTTING CUT OR FILL SURFACES.

11. NOTWITHSTANDING THE MINIMUM STANDARDS SET FORTH IN THE GRADING ORDINANCE AND NOTWITHSTANDING THE APPROVAL OF THESE RECLAMATION PLANS, THE PERMITTEE IS RESPONSIBLE FOR THE PREVENTION OF DAMAGE TO THE ADJACENT PROPERTY. NO PERSON SHALL EXCAVATE ON LAND SO CLOSE TO THE PROPERTY LINE AS TO ENDANGER ANY ADJOINING PUBLIC STREET, SIDEWALK, ALLEY, FUNCTION OF ANY SEWAGE DISPOSAL SYSTEM OR ANY OTHER PUBLIC OR PRIVATE PROPERTY WITHOUT SUPPORTING AND PROTECTING SUCH PROPERTY FROM SETTLING, CRACKING, EROSION, SILTING, SCOUR OR OTHER DAMAGE WHICH MIGHT RESULT FORM THE GRADING DESCRIBED ON THIS PLAN. THE COUNTY WILL HOLD THE PERMITTEE RESPONSIBLE FOR CORRECTION OF NON-DEDICATED IMPROVEMENTS WHICH DAMAGE ADJACENT PROPERTY.

12. SLOPE RATIOS:

    MAXIMUM SLOPE RATIOS TO BE 3:1

13. IF ANY ARCHAEOLOGICAL RESOURCES ARE DISCOVERED ON THE SITE DURING GRADING OPERATIONS, SUCH OPERATIONS WILL CEASE IMMEDIATELY AND THE PERMITTEE WILL NOTIFY THE DIRECTOR OF PUBLIC WORKS OF THE DISCOVERY. GRADING OPERATIONS WILL NOT RECOMMENCE UNTIL THE PERMITTEE HAS RECEIVED WRITTEN AUTHORITY FROM THE DIRECTOR OF PUBLIC WORKS TO DO SO.

14. COMPACTION TESTING AND A COMPACTION REPORT IS REQUIRED FOR ALL FINISH PADS THAT ARE OVER 12" IN DEPTH.

15. AN INDUSTRIAL SWPPP WILL OUTLINE BEST MANAGEMENT PRACTICES REQUIRED DURING MINING AND RECLAMATION.

16. EXISTING TRAFFIC SIGNS ALONG WILLOW GLEN ROAD TO REMAIN. SIGNS WILL BE ADDED TO SITE ENTRANCE AND EXIT AS REQUIRED BY THE COUNTY OF SAN DIEGO. SMALL SAFETY SIGNS REQUIRED BY MSHA WILL BE PLACED ON FENCES AROUND THE PROJECT AREA. NO SIGNS WILL BE ILLUMINATED.

17. CONTRACTOR SHALL REMOVE BOTH ABOVEGROUND STORAGE TANKS AT THE EXISTING GOLF COURSE MAINTENANCE FACILITY. ONE IS A 1,000 GALLON DIESEL AST AND THE OTHER IS A 500 GALLON GASOLINE AST.

DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE COUNTY OF SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

WAYNE W. CHANG
CHANG CONSULTANTS
P.O. BOX 9496
RANCHO SANTA FE, CA 92067
PHONE: (858) 692-0760

BY: _____ DATE: _____

WAYNE W. CHANG, R.C.E. 46548

PROJECT PHASING

PHASE 1 – 319,200 CY CUT (MINING/BACKFILL OVEREX 971,200 CY CUT)
THE FIRST PHASE (PHASE 1) WILL INCLUDE SITE DEVELOPMENT FOR THE CONSTRUCTION OF THE ACCESS ROAD, PROCESSING AREA PAD, SCREENING BERMS AND INSTALLATION OF THE CONVEYOR LINE AND PROCESSING PLANT. IN ADDITION THE PROJECT WILL WIDEN AND RESTRIPE A PORTION OF WILLOW GLEN DRIVE AND ADD A 5- TO 8-WIDE PATHWAY ALONG A PORTION OF WILLOW GLEN DRIVE. FOLLOWING INITIAL SITE DEVELOPMENT ACTIVITIES, EXTRACTIVE OPERATIONS WILL COMMENCE IN THE AREA WEST OF STEELE CANYON ROAD.

INITIAL EXTRACTIVE OPERATIONS WILL INVOLVE REMOVAL OF ALL MATERIALS FROM THE SURFACE TO APPROXIMATELY 15 TO 40 FEET BELOW GROUND SURFACE (BGS) WITH A COMBINATION OF FRONT END LOADERS AND AN EXCAVATOR. EACH PIECE OF EXCAVATION EQUIPMENT WILL WORK IN SEPARATE AREAS. THIS EQUIPMENT WILL MOVE MATERIAL DIRECTLY TO THE CONVEYOR. APPROXIMATELY, 79 ACRES WILL BE INCLUDED IN PHASE 1 WHICH WILL INCLUDE APPROXIMATELY 10 ACRES OF HABITAT IMPROVEMENT WITHIN THE RIVER CHANNEL ON THE SOUTHWEST END OF THE PROJECT.

PHASE 1 WILL BEGIN EXCAVATION IN THE SUB-PHASE 1A AREA SOUTH OF THE RIVER CHANNEL. ONCE EXCAVATION IS COMPLETE IN SUB-PHASE 1A, THE CONVEYOR LINE AND EXCAVATING EQUIPMENT WILL MOVE TO THE SUB-PHASE 1B AREA ON THE SOUTHWESTERN EDGE OF THE PROJECT. RECLAMATION IN SUB-PHASE 1A WOULD THEN BEGIN WITH FINAL GRADING, INSTALLATION OF IRRIGATION EQUIPMENT AND REVEGETATION. THIS PROCESS WILL CONTINUE IN SUB-PHASES 1B AND 1C. EXCAVATION IN EACH SUB-PHASE IS EXPECTED TO TAKE APPROXIMATELY ONE YEAR.

RECLAMATION OF THE PHASE 1 AREA WILL BEGIN ANNUALLY AS THE FINAL LANDFORMS ARE ESTABLISHED IN EACH SUB-PHASE. RECLAMATION WILL INCLUDE ESTABLISHMENT OF ALL FINAL SLOPES, INCORPORATION OF ANY ACCUMULATED WASH FINES AND TOPSOIL; REVEGETATION USING NATIVE SPECIES COMMON TO RIPARIAN HABITAT AND/OR UPLAND VEGETATION DEPENDING ON THE LOCATION OF THE LANDFORM; ESTABLISHMENT OF PADS SUITABLE FOR FUTURE DEVELOPMENT SEEDED WITH AN EROSION SEED MIX; WEED CONTROL, AND MONITORING.

PHASE 2 – 356,500 CY CUT (MINING/BACKFILL OVEREX 458,200 CY CUT)
PHASE 2 WILL CONTINUE THE IDENTICAL EXTRACTION PROCESS IN A WEST TO EAST DIRECTION ON AN AREA OF APPROXIMATELY 48 ACRES EAST OF THE STEELE CANYON ROAD BRIDGE. THIS PHASE IS ANTICIPATED TO LAST APPROXIMATELY 3 YEARS. EXCAVATION OF THE MATERIALS WILL CONTINUE IN THE WEST AND PROCEED EASTWARD IN THE SAME FASHION AS UTILIZED IN PHASE 1. THE MAXIMUM DEPTH OF THE EXCAVATION IS EXPECTED TO BE APPROXIMATELY 15 TO 40 FEET BELOW GROUND SURFACE OUTSIDE THE CHANNEL.

PHASE 2 WILL ALSO INCLUDE 3 SUB-PHASES OF 14 TO 19 ACRE AREAS THAT WILL BEGIN WITH SUB-PHASE 2A AND PROGRESS TO THE NORTHEAST. EXCAVATION IN EACH SUB-PHASE IS EXPECTED TO BE COMPLETED IN APPROXIMATELY 1 YEAR.

RECLAMATION OF THE PHASE 2 SUB-PHASES WILL BEGIN EACH YEAR AS THE FINAL LANDFORMS ARE ESTABLISHED IN EACH SUB-PHASE. RECLAMATION WILL INCLUDE ESTABLISHMENT OF ALL FINAL SLOPES, INCORPORATION OF ANY ACCUMULATED WASH FINES AND TOPSOIL, REVEGETATION OF THE CHANNEL USING NATIVE SPECIES COMMON TO RIPARIAN HABITAT, UPLAND VEGETATION ON THE UPPER SLOPES AND ESTABLISHMENT OF PADS SUITABLE FOR FUTURE DEVELOPMENT. PADS WILL BE SEEDED WITH AN EROSION CONTROL SEED MIX. SEEDING AND PLANTING WILL GENERALLY OCCUR DURING THE RAINY SEASON.

PHASE 3 – 1,052,200 CY CUT (MINING/BACKFILL OVEREX 863,300 CY CUT)
THE EXCAVATION PROCESS IN PHASE 3 IS A REPEAT OF PHASE 2 ON APPROXIMATELY 79 ACRES OF THE VALLEY, EAST OF THE PHASE 2 AREA. PHASE 3 IS ANTICIPATED TO LAST ABOUT 4 YEARS, WILL INCLUDE 4 SUB-PHASES AND WILL EMPLOY THE SAME PROCEDURE AS THE TWO PREVIOUS PHASES. UPON CONCLUSION OF PHASE 2, THE CONVEYOR LINE WILL BE RELOCATED TO RUN FROM THE PLANT TO THE EAST. SUB-PHASE 3A WILL BE LOCATED AT THE NORTHEAST EDGE OF THE PROPERTY. EXCAVATION OF EACH SUB-PHASE WILL PROCEED WESTWARD

RECLAMATION IN EACH OF THE PHASE 3 SUB-PHASES WILL BEGIN EACH YEAR AS THE FINAL LANDFORMS ARE ESTABLISHED. RECLAMATION WILL INCLUDE ESTABLISHMENT OF ALL FINAL SLOPES, INCORPORATION OF ANY ACCUMULATED WASH FINES AND TOPSOIL, REVEGETATION OF THE CHANNEL USING NATIVE SPECIES COMMON TO RIPARIAN HABITAT, UPLAND VEGETATION ON THE UPPER SLOPES AND ESTABLISHMENT OF PADS SUITABLE FOR POSSIBLE FUTURE DEVELOPMENT. ALL PADS WILL BE PLANTED WITH AN EROSION CONTROL SEED MIX.

PHASE 4 – 246,300 CY CUT
PHASE 4 WILL CONSIST OF EXCAVATION OF MATERIALS BENEATH PLANT, BACKFILLING PLANT AREA, FINAL RECLAMATION EFFORTS, CLEANUP AND EQUIPMENT REMOVAL. REVEGETATION MONITORING WILL CONTINUE AFTER THIS FINAL PHASE. MINE PHASE ACREAGES AND THE ESTIMATED DURATION OF EACH PHASE ARE SUMMARIZED IN TABLE 4 AND ASSUMES A PROJECT START IN 2021.

MINING EARTHWORK QUANTITIES

	0	CY	FILL
EAST	1,655,000	CY	CUT (2,482,500 TONS)
WEST	319,200	CY	CUT (478,800 TONS)
OVEREXCAVATION	2,292,700	CY	CUT (3,439,050 TONS)
TOTAL	4,266,900	CY	CUT (6,400,350 TONS)

MINE PHASE ACREAGES

Mining Phase	Phase Area (acres)	Sub-phase Area (acres)	Mining Duration (years)	Mining Initiation Date (est.)	Mining Completion Date (est.)	Reclamation Completion Date (est.)
1	78.98		3	2025	2028	2030
Sub-phase 1a		22.10	1			
Sub-phase 1b		26.46	1			
Sub-phase 1c		30.42	1			
2	48.18		3	2028	2031	2033
Sub-phase 2a		15.26	1			
Sub-phase 2b		19.08	1			
Sub-phase 2c		13.74	1			
3	78.57		4	2031	2035	2037
Sub-phase 3a		29.42	1			
Sub-phase 3b		16.15	1			
Sub-phase 3c		14.13	1			
Sub-phase 3d		18.87	1			
Phase 4	8.65		1	2035	2035	2037
Total	214.4		10	-	-	

RESOURCE AGENCY PERMITTING

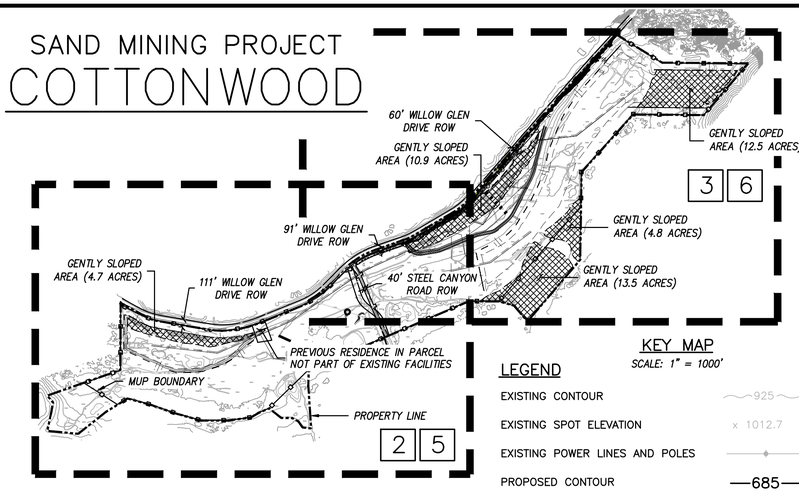
THE SUBJECT PROPERTY CONTAINS WETLANDS, A LAKE, A STREAM, AND/OR WATERS OF THE U.S. AND/OR STATE WHICH MAY BE SUBJECT TO REGULATION BY STATE AND/OR FEDERAL AGENCIES, INCLUDING, BUT NOT LIMITED TO, THE REGIONAL WATER QUALITY CONTROL BOARD, U.S. ARMY CORPS OF ENGINEERS AND THE CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE. IT IS THE APPLICANT'S RESPONSIBILITY TO CONSULT WITH EACH AGENCY TO DETERMINE IF A PERMIT, AGREEMENT OR OTHER APPROVAL IS REQUIRED AND TO OBTAIN ALL NECESSARY PERMITS, AGREEMENTS OR APPROVALS BEFORE COMMENCING ANY ACTIVITY WHICH COULD IMPACT THE WETLANDS, LAKE, STREAM, AND/OR WATERS OF THE U.S. ON THE SUBJECT PROPERTY. THE AGENCY CONTACT INFORMATION IS PROVIDED BELOW.

U.S. ARMY CORPS OF ENGINEERS:
915 WILSHIRE BLVD., SUITE 1101
LOS ANGELES, CA 90017
(213) 452-3333
HTTP://WWW.USACE.ARMY.MIL/

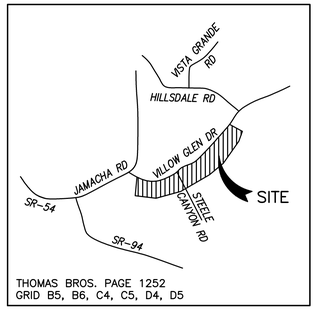
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE:
3883 RUFFIN RD.
SAN DIEGO, CA 92123
(858) 636-3160
ASKR5@WILDLIFE.CA.GOV
HTTP://WWW.DFG.CA.GOV/

REGIONAL WATER QUALITY CONTROL BOARD:
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO, CA 92108
RB9_DREDGEFILL@WATERBOARDS.CA.GOV
HTTP://WWW.WATERBOARDS.CA.GOV/SANDIEGO/

SAND MINING PROJECT
COTTONWOOD



KEY MAP
SCALE: 1" = 1000'



THOMAS BROS. PAGE 1252
GRID B5, B6, C4, C5, D4, D5

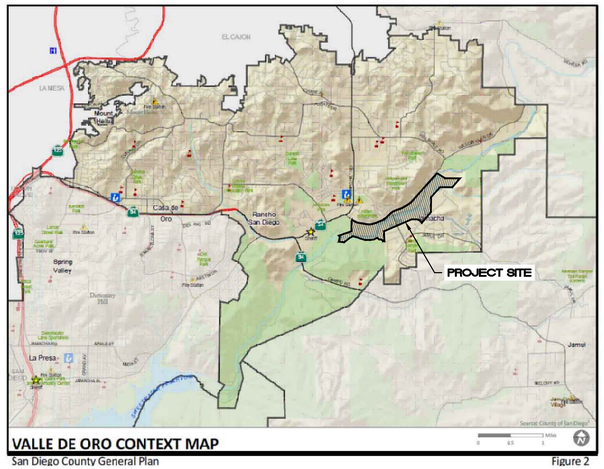
VICINITY MAP

DISCRETIONARY REVIEW APPROVAL

THIS PLAN IS PROVIDED TO ALLOW FOR FULL AND ADEQUATE DISCRETIONARY REVIEW OF A PROPOSED DEVELOPMENT PROJECT. THE PROPERTY OWNER ACKNOWLEDGES THAT ACCEPTANCE OR APPROVAL OF THIS PLAN DOES NOT CONSTITUTE AN APPROVAL TO PERFORM ANY GRADING SHOWN HEREON, AND AGREES TO OBTAIN VALID GRADING PERMISSIONS BEFORE COMMENCING SUCH ACTIVITY.

LEGEND

EXISTING CONTOUR 925
EXISTING SPOT ELEVATION x 1012.7
EXISTING POWER LINES AND POLES
PROPOSED CONTOUR 685
PROPOSED GRADE 1.0%
PUBLIC PATHWAY
PROPERTY LINE
MUP BOUNDARY
DAYLIGHT LINE
PROPOSED SLOPE
PROPOSED PERIMETER FENCE
PROPOSED POWER LINES
EFFECTIVE FEMA FLOODWAY
EFFECTIVE FEMA FLOODWAY
PROPOSED TRAILS (ALL TRAILS ARE MULTIPURPOSE)
PROPOSED STOCKPILES (8' TO 12' HIGH)
PROPOSED GROUTED LIGHT CLASS RIPRAP
PROPOSED FLOW
CROSS-SECTION LINES A A
PROPOSED TREE WELLS
SECURITY LIGHT



VALLE DE ORO CONTEXT MAP
San Diego County General Plan
VALLE DE ORO COMMUNITY PLAN
Figure 2
5

SHEET INDEX

SHEET 1	COVER SHEET
SHEET 2	PLOT PLAN
SHEET 3	PLOT PLAN
SHEET 4	PLANT DETAILS
SHEET 5	RECLAMATION PLAN
SHEET 6	RECLAMATION PLAN
SHEET 7	SITE CROSS-SECTIONS
SHEET 8	SITE CROSS-SECTIONS
SHEET 9	FINAL PLAN
SHEET 10	REVEGETATION PLAN
SHEET 11	EASEMENT PLAN

PERMIT NUMBERS

PDS2018-MUP-18-023,
PDS2018-RP-18-001,
PDS2018-ER-18-19-007

LEGAL DESCRIPTION

PARCEL 'E' OF C/C 90-0204 TOGETHER WITH PARCELS 'A' AND 'B' OF B/C 92-0038.

PROJECT DESCRIPTION

THE PROJECT PROPOSES TO MINE SAND SUITABLE FOR PORTLAND CEMENT CONCRETE (PCC) USE OVER AN EXTENDED PERIOD WITHIN DESIGNATED PHASES. RECLAMATION OF THE MINED LANDS WILL FOLLOW AS SOON AS MINING OPERATIONS ARE COMPLETED IN A SPECIFIC AREA. RECLAMATION PROCEDURES WILL BE PHASED WITH MINING OPERATIONS AND WILL BE INITIATED IMMEDIATELY AFTER THE CONCLUSION OF RESOURCE EXTRACTION AND BACKFILLING TO DESIGN ELEVATIONS.

THE MAXIMUM LEVEL OF AGGREGATE PRODUCTION IS ANTICIPATED TO BE 570,000 TONS PER YEAR (TPY). THIS LEVEL OF PRODUCTION WILL BE REALIZED AFTER 1 YEAR OF SITE DEVELOPMENT. ACTUAL PRODUCTION LEVELS AND PROJECT LIFE WILL DEPEND ON MARKET DEMAND BUT WILL NOT EXCEED THE MAXIMUM PERMITTED PRODUCTION LEVEL. THE PROJECT IS EXPECTED TO CONTINUE FOR 12 YEARS. THIS WILL INCLUDE 10 YEARS OF EXTRACTION AND RECLAMATION OF PREVIOUS PHASES. RECLAMATION OF PREVIOUSLY DISTURBED AREAS IS ANTICIPATED TO BEGIN IN YEAR 2. VEGETATION MONITORING WILL CONTINUE FOR 5 YEARS AFTER MINING CEASES.

WORK TO BE DONE

THE IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE IN ACCORDANCE WITH THESE PLANS, THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (2021 EDITION), THE REGIONAL SUPPLEMENT AMENDMENTS (2012 EDITION), THE SAN DIEGO AREA REGIONAL STANDARD DRAWINGS (DATED JULY 2018), SAN DIEGO COUNTY GRADING ORDINANCE, CONSTRUCTION DEMOLITION AND RECYCLING ORDINANCE, LANDSCAPE ORDINANCE, FLOOD DAMAGE AND PREVENTION ORDINANCE, WATERSHED PROTECTION ORDINANCE, HYDROLOGY MANUAL, 2003, HYDRAULIC DESIGN MANUAL, 2014, RESOURCE PROTECTION ORDINANCE, AND BIOLOGICAL MITIGATION ORDINANCE.

OWNER

COTTONWOOD CAJON ES LLC
9255 DOHENY ROAD, #602
WEST HOLLYWOOD, CA 90069

PERMITTEE

GREG BROWN
NEW WEST DEVELOPMENT
565 N. MAGNOLIA AVE.,
EL CAJON, CA 92020

ASSESSOR'S PARCEL NUMBERS

THE PROJECT IS LOCATED ON TWENTY-TWO SEPARATE ASSESSORS PARCELS (APNS) AS PRESENTED IN FOLLOWING TABLE. PORTIONS OF THE PROPERTY WILL NOT BE MINED ALTHOUGH THOSE AREAS MAY BE DISTURBED AS PART OF THE RECLAMATION EFFORT FOR THE PROPERTY.

APN	TOTAL ACRES (APPROX.)	OWNER	ZONING	GENERAL PLAN LAND USE
506-021-1900	8.20	COTTONWOOD CAJON ES, LLC	S88	OS-R
506-020-5200	4.01	COTTONWOOD CAJON ES, LLC	S80	OS-R
518-012-1300	2.97	COTTONWOOD CAJON ES, LLC	S90	OS-R
518-012-1400	46.61	COTTONWOOD CAJON ES, LLC	S90	OS-R
518-030-0500	2.30	COTTONWOOD CAJON ES, LLC	S90	OS-R
518-030-0600	5.58	COTTONWOOD CAJON ES, LLC	S90	OS-R
518-030-0700	2.59	COTTONWOOD CAJON ES, LLC	S90	OS-R
518-030-0800	0.69	COTTONWOOD CAJON ES, LLC	S90	OS-R
518-030-1000	7.16	COTTONWOOD CAJON ES, LLC	S90	OS-R
518-030-1200	6.88	COTTONWOOD CAJON ES, LLC	S90	OS-R
518-030-1300	10.20	COTTONWOOD CAJON ES, LLC	S90	OS-R
518-030-1500	4.04	COTTONWOOD CAJON ES, LLC	S90	OS-R
518-030-2100	56.71	COTTONWOOD CAJON ES, LLC	S90	OS-R
518-030-2200	19.43	COTTONWOOD CAJON ES, LLC	S90	OS-R
519-010-1500	33.72	COTTONWOOD CAJON ES, LLC	S90	OS-R
519-010-1700	14.59	COTTONWOOD CAJON ES, LLC	S90	OS-R
519-010-2000	19.22	COTTONWOOD CAJON ES, LLC	S90	OS-R
519-010-2100	1.10	COTTONWOOD CAJON ES, LLC	S90	OS-R
519-010-3300	1.76	COTTONWOOD CAJON ES, LLC	S90	OS-R
519-010-3400	7.17	COTTONWOOD CAJON ES, LLC	S90	OS-R
519-010-3700	1.06	COTTONWOOD CAJON ES, LLC	S90	OS-R
519-011-0300	23.80	COTTONWOOD CAJON ES, LLC	S88	OS-R
TOTALS:	279.79			

DEFINITIONS

S90	HOLDING AREA
S88	SPECIFIC PLAN AREA
S80	OPEN SPACE
OS-R	OPEN SPACE - RECREATION

FOR REVIEW ONLY

PERMITS

HABITAT LOSS PERMIT NO. _____
INDUSTRIAL GENERAL PERMIT WDID NO. _____
MAJOR USE PERMIT _____
RECLAMATION PLAN NO. _____
PUBLIC IMPROVEMENT PLAN NO. _____
LOMR NO. _____
404 PERMIT NO. _____
401 PERMIT NO. _____
1602 PERMIT NO. _____

PRIVATE CONTRACT

SHEET 1 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 11 SHEETS

RECLAMATION PLAN FOR:
COTTONWOOD SAND MINING PROJECT

CALIFORNIA COORDINATE INDEX: 210-1791

Approved COUNTY ENGINEER
BY: _____ Date

Engineer of work
WAYNE W. CHANG R.C.E. 46548

Grading Permit No. _____

COUNTY APPROVED CHANGES

No.	Description	Approved by	Date
	ORIGINAL		X-X-XX

BENCHMARK

DESCRIPTION: COTTONWOOD GOLF COURSE
LOCATION: NAD 83, EPOCH 1998.50, ZONE 6, GEOID 3
RECORD FROM: ROS 16512
ELEVATION: 488.50 FEET DATUM: NGVD 29

FILE NO.

7/14/2024

SECTION: SITE ACCESS
NOT TO SCALE

DETAIL: PERIMETER FENCE
NOT TO SCALE

NOTES:
1. DG ROADS TO BE CONSTRUCTED PER SECTION 3.10 OF THE 'SAN DIEGO COUNTY STANDARDS FOR PRIVATE ROADS.'
2. ROADS TO BE TWO-WAY ROADS. IN EVENT OF PASSING, ONE VEHICLE WILL TEMPORARILY MOVE ONTO DIRT SURFACE ADJACENT TO ROAD UNTIL PASSING IS COMPLETE. SURFACE RUNOFF TO SHEET FLOW ACROSS OR ALONG ROADS AT 1% MINIMUM SLOPE. SHEET FLOW TO FOLLOW DRAINAGE PATTERN OF AREAS ADJACENT TO ROADS. THERE SHALL BE NO SURFACE PONDING ON ROADS.
3. ROADS WILL BE PRIVATE, SO EASEMENTS ARE NOT NEEDED.

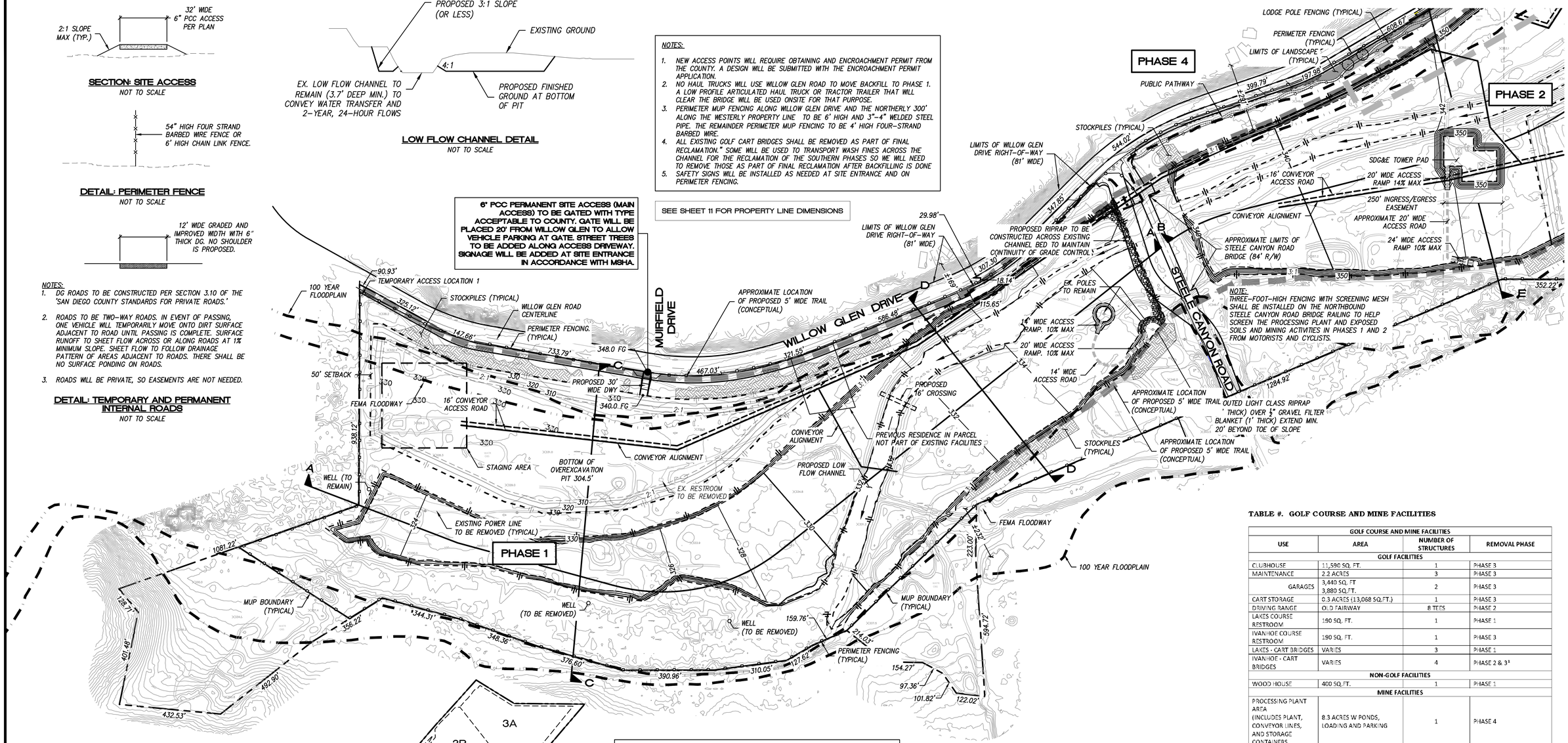
DETAIL: TEMPORARY AND PERMANENT INTERNAL ROADS
NOT TO SCALE

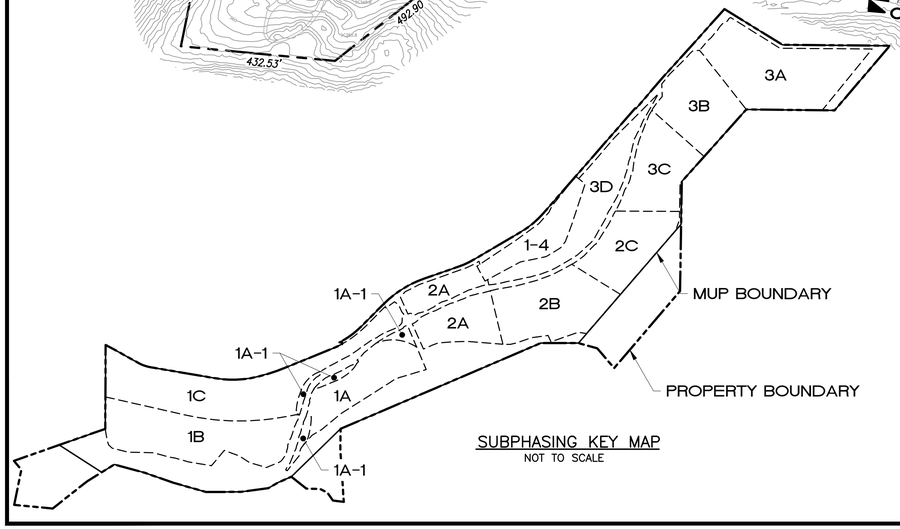
LOW FLOW CHANNEL DETAIL
NOT TO SCALE

NOTES:
1. NEW ACCESS POINTS WILL REQUIRE OBTAINING AND ENCROACHMENT PERMIT FROM THE COUNTY. A DESIGN WILL BE SUBMITTED WITH THE ENCROACHMENT PERMIT APPLICATION.
2. NO HAUL TRUCKS WILL USE WILLOW GLEN ROAD TO MOVE BACKFILL TO PHASE 1. A LOW PROFILE ARTICULATED HAUL TRUCK OR TRACTOR TRAILER THAT WILL CLEAR THE BRIDGE WILL BE USED ONSITE FOR THAT PURPOSE.
3. PERIMETER MUP FENCING ALONG WILLOW GLEN DRIVE AND THE NORTHERLY 300' ALONG THE WESTERLY PROPERTY LINE TO BE 6' HIGH AND 3"-4" WELDED STEEL PIPE. THE REMAINDER PERIMETER MUP FENCING TO BE 4' HIGH FOUR-STRAND BARBED WIRE.
4. ALL EXISTING GOLF CART BRIDGES SHALL BE REMOVED AS PART OF FINAL RECLAMATION." SOME WILL BE USED TO TRANSPORT WASH FINES ACROSS THE CHANNEL FOR THE RECLAMATION OF THE SOUTHERN PHASES SO WE WILL NEED TO REMOVE THOSE AS PART OF FINAL RECLAMATION AFTER BACKFILLING IS DONE
5. SAFETY SIGNS WILL BE INSTALLED AS NEEDED AT SITE ENTRANCE AND ON PERIMETER FENCING.

6' PCC PERMANENT SITE ACCESS (MAIN ACCESS) TO BE GATED WITH TYPE ACCEPTABLE TO COUNTY. GATE WILL BE PLACED 20' FROM WILLOW GLEN TO ALLOW VEHICLE PARKING AT GATE. STREET TREES TO BE ADDED ALONG ACCESS DRIVEWAY. SIGNAGE WILL BE ADDED AT SITE ENTRANCE IN ACCORDANCE WITH MSHA.

SEE SHEET 11 FOR PROPERTY LINE DIMENSIONS





SUBPHASING KEY MAP
NOT TO SCALE

UTILITY NOTES:
1. SDG&E NOTE: A MINIMUM 30' WORKING PAD SHALL BE MAINTAINED AROUND THE SDG&E POWER POLES. THE WEST PAD SHALL SLOPE AT 1% TO THE PAD RAMP. THE EAST PAD SHALL SLOPE 1% TO THE ADJACENT GROUND TO THE SOUTHEAST. EACH SDG&E ACCESS RAMP SHALL HAVE A 2% INWARD CROSS-SLOPE TO PREVENT STORM RUNOFF FROM FLOWING OVER THE RAMP EDGE. THE SDG&E ACCESS ROAD BETWEEN RAMPS SHALL HAVE A 2% CROSS-SLOPE DOWN TOWARDS THE WEST. THE ACCESS ROAD SHALL HAVE A MINIMUM 75' TURN RADIUS.
2. CAUTION: ENERGIZED OVERHEAD CONDUCTORS, ELEVATION VARIES, MUST MAINTAIN 20' RADIAL CLEARANCE, STANDBY LINEMAN IS REQUIRED FOR SAFETY WATCH FOR THE PROPOSED SAND MINING PROJECT COTTONWOOD. PROTECT IN PLACE EXISTING LATTICE TOWERS, POLES, GUY WIRES & ANCHORS FOR THE PROPOSED SAND MINING PROJECT COTTONWOOD PROJECT. CONTACT DIVERSIFIED UTILITY SERVICES INC. (858-278-2880) 30 DAYS IN ADVANCE OF CONSTRUCTION TO SCHEDULE STANDBY. NO GRADING WITHIN 20' OF EXISTING STEEL LATTICE TOWER FOUNDATIONS & NO GRADING WITHIN 30' OF EXISTING STEEL POLE FOUNDATION.

SCALE: 1" = 200'
0 100 200 400

TABLE #. GOLF COURSE AND MINE FACILITIES

GOLF COURSE AND MINE FACILITIES			
USE	AREA	NUMBER OF STRUCTURES	REMOVAL PHASE
GOLF FACILITIES			
CLUBHOUSE	11,590 SQ. FT.	1	PHASE 3
MAINTENANCE	2.2 ACRES	3	PHASE 3
GARAGES	3,440 SQ. FT 3,880 SQ.FT.	2	PHASE 3
CART STORAGE	0.3 ACRES (13,068 SQ.FT.)	1	PHASE 3
DRIVING RANGE	0.0 FAIRWAY	8 TEES	PHASE 2
LAKES COURSE RESTROOM	190 SQ. FT.	1	PHASE 1
IVANHOE COURSE RESTROOM	190 SQ. FT.	1	PHASE 3
LAKES - CART BRIDGES	VARIES	3	PHASE 1
IVANHOE - CART BRIDGES	VARIES	4	PHASE 2 & 3[1]
NON-GOLF FACILITIES			
WOOD HOUSE	400 SQ.FT.	1	PHASE 1
MINE FACILITIES			
PROCESSING PLANT AREA (INCLUDES PLANT, CONVEYOR LINES, AND STORAGE CONTAINERS	8.3 ACRES W PONDS, LOADING AND PARKING	1	PHASE 4
LOADOUT AREA (INCLUDES SCALES, SCALE HOUSE, OFFICE KIOSK)	1.9 OF 8 ACRES	1	PHASE 4
MINE PARKING	0.15 OF 8 ACRES	15 SPACES	END OF PROJECT
FENCING, GATES AND SIGNS	NA		WILL REMAIN ON PROPERTY

[1] ONE CART BRIDGE WOULD BE REMOVED DURING PHASE 2. THE OTHER 3 BRIDGES ON IVANHOE WILL BE REMOVED AS THEY ARE NO LONGER NEEDED.

COUNTY APPROVED CHANGES

No.	Description	Approved by	Date
	ORIGINAL		X-X-XX

PERMITS
HABITAT LOSS PERMIT NO.
INDUSTRIAL GENERAL PERMIT WDID NO.
MAJOR USE PERMIT
RECLAMATION PLAN NO.
PUBLIC IMPROVEMENT PLAN NO.
LOMR NO.
404 PERMIT NO.
401 PERMIT NO.
1602 PERMIT NO.

BENCHMARK
DESCRIPTION: COTTONWOOD GOLF COURSE
LOCATION: NAD 83, EPOCH 1998.50, ZONE 6, GEOID 3
RECORD FROM: ROS 16512
ELEVATION: 488.50 FEET DATUM: NGVD 29

PRIVATE CONTRACT

SHEET	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	SHEETS
2		11

PLOT PLAN FOR:
COTTONWOOD SAND MINING PROJECT
CALIFORNIA COORDINATE INDEX: 210-1791

Approved COUNTY ENGINEER BY: Date
Engineer of work WAYNE W. CHANG R.C.E. 46548
Grading Permit No.

FILE NO.
7/14/2024 10:49 PM

ENGINEER'S NAME: CHANG CONSULTANTS
PHONE NO. (858) 692-0760

FOR REVIEW ONLY

NOTES:

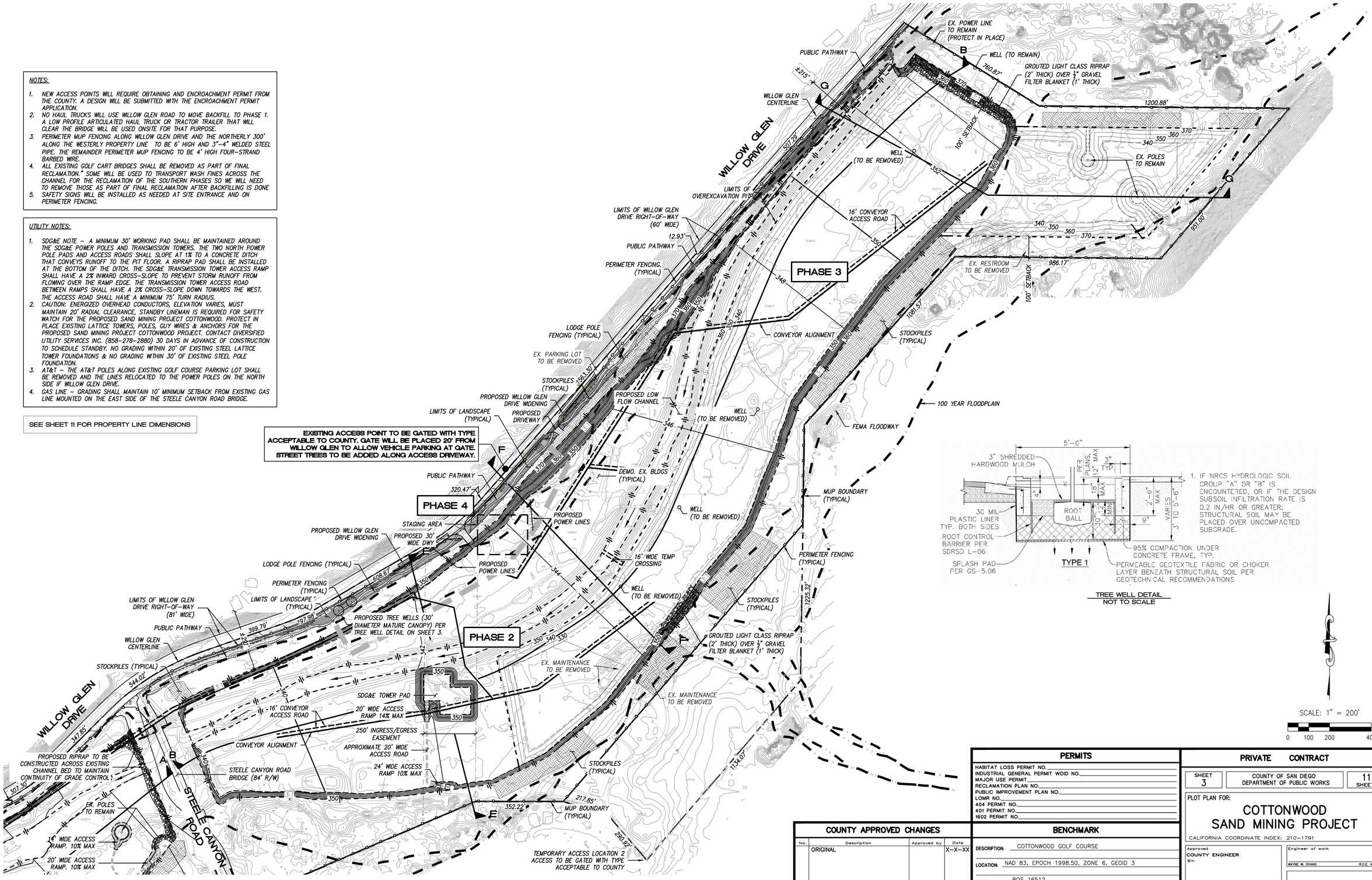
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2. NO HAUL TRUCKS WILL USE WILLOW GLEN ROAD TO MOVE BACKFILL TO PHASE 1. A LOW PROFILE ARTICULATED HAUL TRUCK OR TRACTOR TRAILER THAT WILL CLEAR THE BRIDGE WILL BE USED ONSITE FOR THAT PURPOSE.
3. PERIMETER MUP FENCING ALONG WILLOW GLEN DRIVE AND THE NORTHERLY 300' ALONG THE WESTERLY PROPERTY LINE TO BE 6' HIGH AND 3"-4" WELDED STEEL PIPE. THE REMAINDER PERIMETER MUP FENCING TO BE 4' HIGH FOUR-STRAND BARBED WIRE.
4. ALL EXISTING GOLF CART BRIDGES SHALL BE REMOVED AS PART OF FINAL RECLAMATION." SOME WILL BE USED TO TRANSPORT WASH FINES ACROSS THE CHANNEL FOR THE RECLAMATION OF THE SOUTHERN PHASES SO WE WILL NEED TO REMOVE THOSE AS PART OF FINAL RECLAMATION AFTER BACKFILLING IS DONE
5. SAFETY SIGNS WILL BE INSTALLED AS NEEDED AT SITE ENTRANCE AND ON PERIMETER FENCING.

UTILITY NOTES:

1. SDG&E NOTE – A MINIMUM 30' WORKING PAD SHALL BE MAINTAINED AROUND THE SDG&E POWER POLES AND TRANSMISSION TOWERS. THE TWO NORTH POWER POLE PADS AND ACCESS ROADS SHALL SLOPE AT 1% TO A CONCRETE DITCH THAT CONVEYS RUNOFF TO THE PIT FLOOR. A RIPRAP PAD SHALL BE INSTALLED AT THE BOTTOM OF THE DITCH. THE SDG&E TRANSMISSION TOWER ACCESS RAMP SHALL HAVE A 2% INWARD CROSS-SLOPE TO PREVENT STORM RUNOFF FROM FLOWING OVER THE RAMP EDGE. THE TRANSMISSION TOWER ACCESS ROAD BETWEEN RAMPS SHALL HAVE A 2% CROSS-SLOPE DOWN TOWARDS THE WEST. THE ACCESS ROAD SHALL HAVE A MINIMUM 75' TURN RADIUS.
2. CAUTION: ENERGIZED OVERHEAD CONDUCTORS, ELEVATION VARIES, MUST MAINTAIN 20' RADIAL CLEARANCE, STANDBY LINEMAN IS REQUIRED FOR SAFETY WATCH FOR THE PROPOSED SAND MINING PROJECT COTTONWOOD PROJECT. PROTECT IN PLACE EXISTING LATTICE TOWERS, POLES, GUY WIRES & ANCHORS FOR THE PROPOSED SAND MINING PROJECT COTTONWOOD PROJECT. CONTACT DIVERSIFIED UTILITY SERVICES INC. (858-278-2880) 30 DAYS IN ADVANCE OF CONSTRUCTION TO SCHEDULE STANDBY. NO GRADING WITHIN 20' OF EXISTING STEEL LATTICE TOWER FOUNDATIONS & NO GRADING WITHIN 30' OF EXISTING STEEL POLE FOUNDATION.
3. AT&T – THE AT&T POLES ALONG EXISTING GOLF COURSE PARKING LOT SHALL BE REMOVED AND THE LINES RELOCATED TO THE POWER POLES ON THE NORTH SIDE IF WILLOW GLEN DRIVE.
4. GAS LINE – GRADING SHALL MAINTAIN 10' MINIMUM SETBACK FROM EXISTING GAS LINE MOUNTED ON THE EAST SIDE OF THE STEELE CANYON ROAD BRIDGE.

SEE SHEET 11 FOR PROPERTY LINE DIMENSIONS

EXISTING ACCESS POINT TO BE GATED WITH TYPE ACCEPTABLE TO COUNTY. GATE WILL BE PLACED 20' FROM WILLOW GLEN TO ALLOW VEHICLE PARKING AT GATE. STREET TREES TO BE ADDED ALONG ACCESS DRIVEWAY.



TYPE 1

TREE WELL DETAIL
NOT TO SCALE

SCALE: 1" = 200'

0 100 200 400

FOR REVIEW ONLY

COUNTY APPROVED CHANGES			
No.	Description	Approved by	Date
	ORIGINAL		X-X-XX

BENCHMARK

DESCRIPTION: COTTONWOOD GOLF COURSE

LOCATION: NAD 83, EPOCH 1998.50, ZONE 6, GEOID 3

RECORD FROM: ROS 16512

ELEVATION: 488.50 FEET DATUM: NGVD 29

PERMITS

HABITAT LOSS PERMIT NO.
INDUSTRIAL GENERAL PERMIT WDID NO.
MAJOR USE PERMIT
RECLAMATION PLAN NO.
PUBLIC IMPROVEMENT PLAN NO.
LOMR NO.
404 PERMIT NO.
401 PERMIT NO.
1602 PERMIT NO.

PRIVATE CONTRACT

SHEET 3 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 11 SHEETS

PLOT PLAN FOR:

COTTONWOOD SAND MINING PROJECT

CALIFORNIA COORDINATE INDEX: 210-1791

Approved COUNTY ENGINEER BY: Date

Engineer of work WAYNE W. CHANG R.C.E. 46548

Grading Permit No.

ENGINEER'S NAME: CHANG CONSULTANTS
PHONE NO. (858) 692-0760

FILE NO.

7/15/2024 8:15 PM

8' X 20' Construction Office Floor Plan

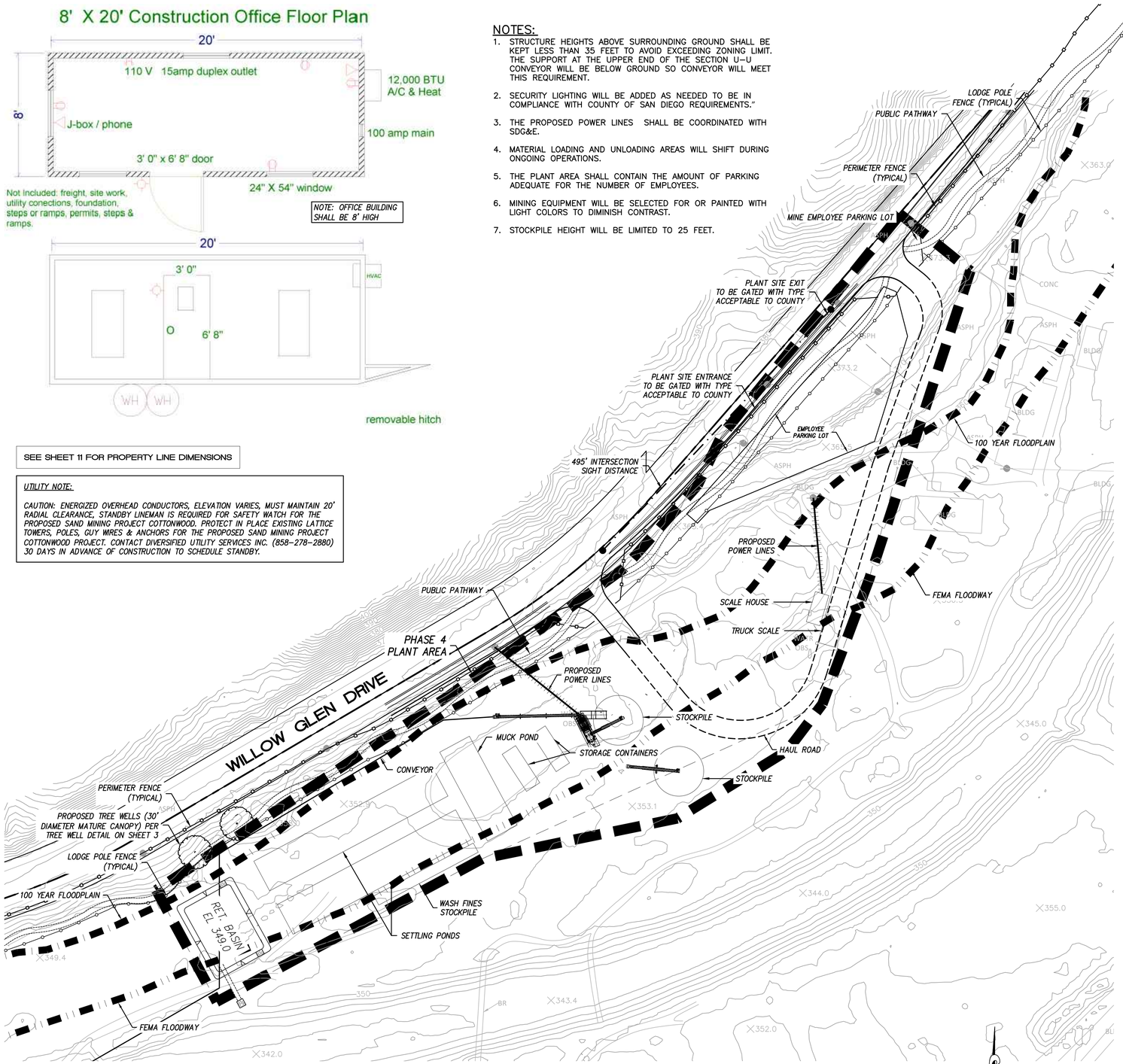
SEE SHEET 11 FOR PROPERTY LINE DIMENSIONS

UTILITY NOTE:

CAUTION: ENERGIZED OVERHEAD CONDUCTORS, ELEVATION VARIES, MUST MAINTAIN 20' RADIAL CLEARANCE, STANDBY LINEMAN IS REQUIRED FOR SAFETY WATCH FOR THE PROPOSED SAND MINING PROJECT COTTONWOOD. PROTECT IN PLACE EXISTING LATTICE TOWERS, POLES, GUY WIRES & ANCHORS FOR THE PROPOSED SAND MINING PROJECT COTTONWOOD PROJECT. CONTACT DIVERSIFIED UTILITY SERVICES INC. (858-278-2880) 30 DAYS IN ADVANCE OF CONSTRUCTION TO SCHEDULE STANDBY.

NOTES:

1. STRUCTURE HEIGHTS ABOVE SURROUNDING GROUND SHALL BE KEPT LESS THAN 35 FEET TO AVOID EXCEEDING ZONING LIMIT. THE SUPPORT AT THE UPPER END OF THE SECTION U–U CONVEYOR WILL BE BELOW GROUND SO CONVEYOR WILL MEET THIS REQUIREMENT.
2. SECURITY LIGHTING WILL BE ADDED AS NEEDED TO BE IN COMPLIANCE WITH COUNTY OF SAN DIEGO REQUIREMENTS."
3. THE PROPOSED POWER LINES SHALL BE COORDINATED WITH SDG&E.
4. MATERIAL LOADING AND UNLOADING AREAS WILL SHIFT DURING ONGOING OPERATIONS.
5. THE PLANT AREA SHALL CONTAIN THE AMOUNT OF PARKING ADEQUATE FOR THE NUMBER OF EMPLOYEES.
6. MINING EQUIPMENT WILL BE SELECTED FOR OR PAINTED WITH LIGHT COLORS TO DIMINISH CONTRAST.
7. STOCKPILE HEIGHT WILL BE LIMITED TO 25 FEET.

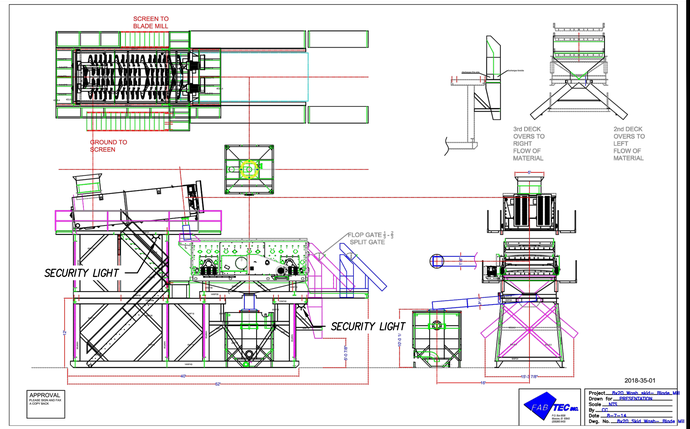


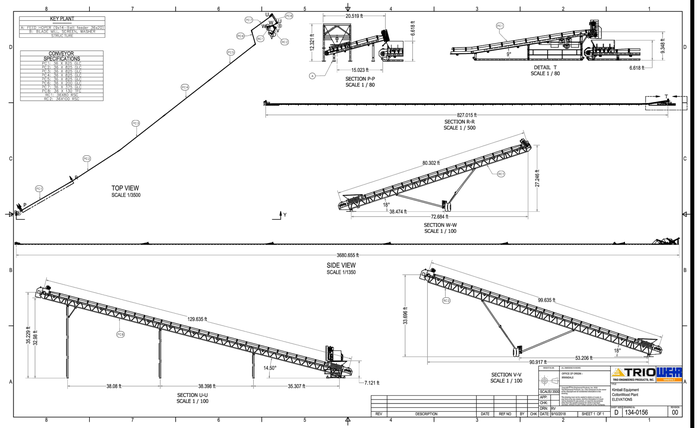
PLANT AREA DETAIL

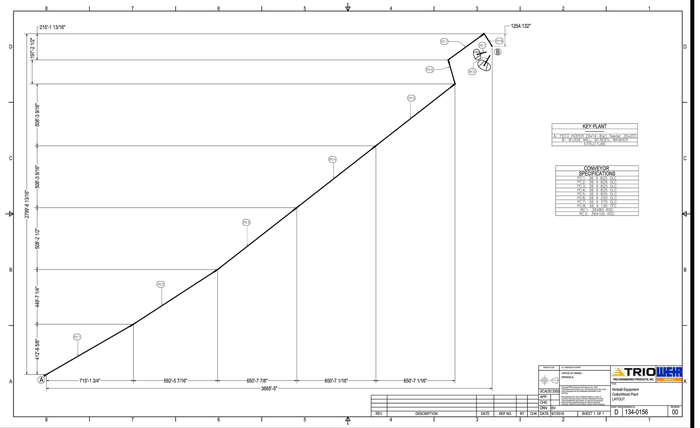
SCALE: 1" = 80'

SCALE: 1" = 60'

0 30 60 120







FOR REVIEW ONLY

PERMITS

HABITAT LOSS PERMIT NO.
INDUSTRIAL GENERAL PERMIT WDID NO.
MAJOR USE PERMIT
RECLAMATION PLAN NO.
PUBLIC IMPROVEMENT PLAN NO.
LOMR NO.
404 PERMIT NO.
401 PERMIT NO.
1602 PERMIT NO.

PRIVATE CONTRACT

SHEET	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	11 SHEETS
4		

PLOT PLAN FOR:

COTTONWOOD SAND MINING PROJECT

CALIFORNIA COORDINATE INDEX: 210–1791

Approved
COUNTY ENGINEER
BY:
Date

Engineer of work
WAYNE W. CHANG R.C.E. 46548

Grading Permit No.

COUNTY APPROVED CHANGES

No.	Description	Approved by	Date
	ORIGINAL		X–X–XX

BENCHMARK

DESCRIPTION: COTTONWOOD GOLF COURSE
LOCATION: NAD 83, EPOCH 1998.50, ZONE 6, GEOID 3
RECORD FROM: ROS 16512
ELEVATION: 488.50 FEET DATUM: NGVD 29

ENGINEER'S NAME: CHANG CONSULTANTS
PHONE NO. (858) 692-0760

FILE NO.

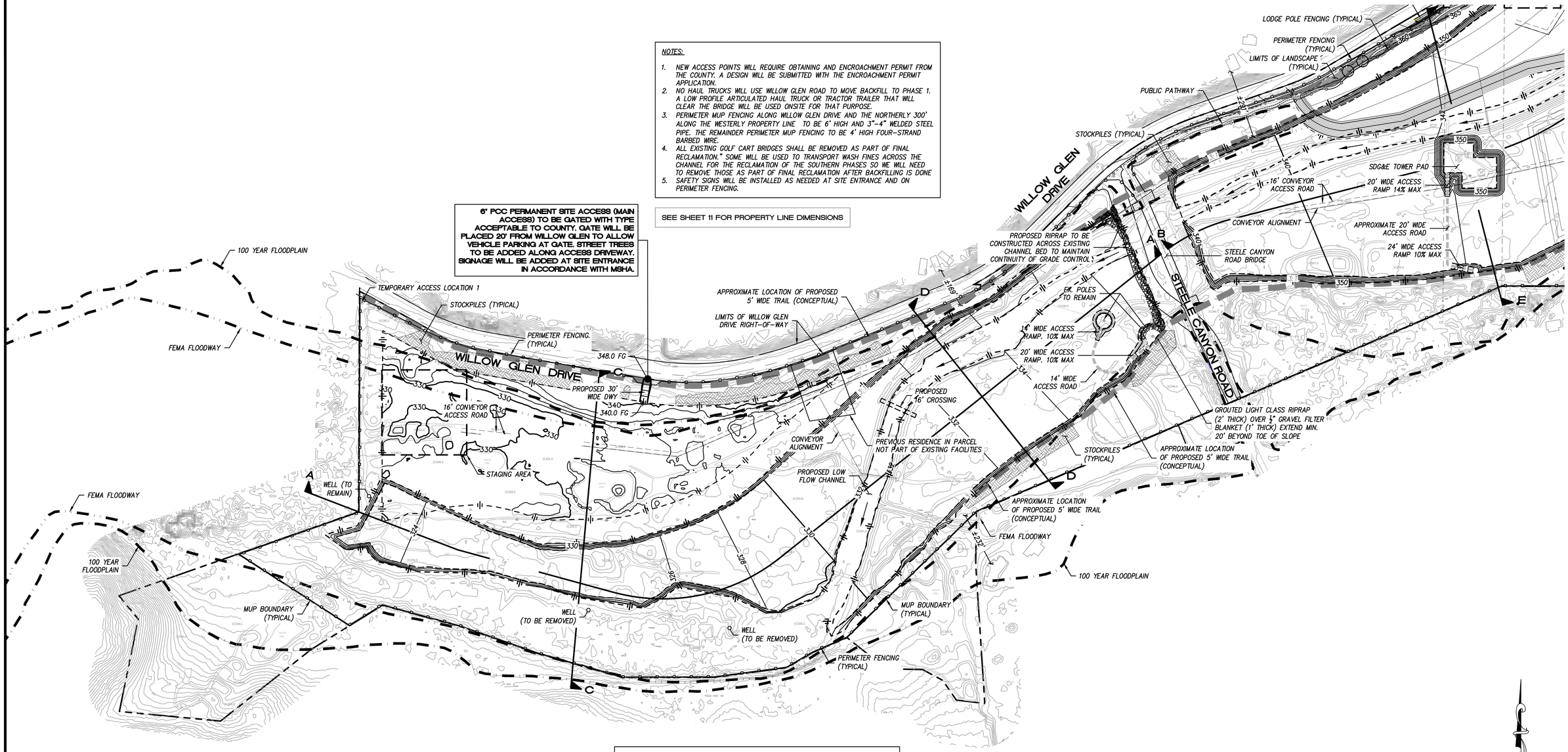
7/15/2024 8:31 PM

NOTES:

1. NEW ACCESS POINTS WILL REQUIRE OBTAINING AND ENCROACHMENT PERMIT FROM THE COUNTY. A DESIGN WILL BE SUBMITTED WITH THE ENCROACHMENT PERMIT APPLICATION.
2. NO HAUL TRUCKS WILL USE WILLOW GLEN ROAD TO MOVE BACKFILL TO PHASE 1. A LOW PROFILE ARTICULATED HAUL TRUCK OR TRACTOR TRAILER THAT WILL CLEAR THE BRIDGE WILL BE USED ONSITE FOR THAT PURPOSE.
3. PERIMETER MUP FENCING ALONG WILLOW GLEN DRIVE AND THE NORTHERLY 300' ALONG THE WESTERLY PROPERTY LINE TO BE 6' HIGH AND 3"–4" WELDED STEEL PIPE. THE REMAINDER PERIMETER MUP FENCING TO BE 4' HIGH FOUR–STRAND BARBED WIRE.
4. ALL EXISTING GOLF CART BRIDGES SHALL BE REMOVED AS PART OF FINAL RECLAMATION." SOME WILL BE USED TO TRANSPORT WASH FINES ACROSS THE CHANNEL FOR THE RECLAMATION OF THE SOUTHERN PHASES SO WE WILL NEED TO REMOVE THOSE AS PART OF FINAL RECLAMATION AFTER BACKFILLING IS DONE
5. SAFETY SIGNS WILL BE INSTALLED AS NEEDED AT SITE ENTRANCE AND ON PERIMETER FENCING.

6' PCC PERMANENT SITE ACCESS (MAIN ACCESS) TO BE GATED WITH TYPE ACCEPTABLE TO COUNTY. GATE WILL BE PLACED 20' FROM WILLOW GLEN TO ALLOW VEHICLE PARKING AT GATE. STREET TREES TO BE ADDED ALONG ACCESS DRIVEWAY. SIGNAGE WILL BE ADDED AT SITE ENTRANCE IN ACCORDANCE WITH MSHA.

SEE SHEET 11 FOR PROPERTY LINE DIMENSIONS



UTILITY NOTES:

1. SDG&E NOTE: A MINIMUM 30' WORKING PAD SHALL BE MAINTAINED AROUND THE SDG&E POWER POLES. THE WEST PAD SHALL SLOPE AT 1% TO THE PAD RAMP. THE EAST PAD SHALL SLOPE 1% TO THE ADJACENT GROUND TO THE SOUTHEAST. EACH SDG&E ACCESS RAMP SHALL HAVE A 2% INWARD CROSS–SLOPE TO PREVENT STORM RUNOFF FROM FLOWING OVER THE RAMP EDGE. THE SDG&E ACCESS ROAD BETWEEN RAMPS SHALL HAVE A 2% CROSS–SLOPE DOWN TOWARDS THE WEST. THE ACCESS ROAD SHALL HAVE A MINIMUM 75' TURN RADIUS.
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SCALE: 1" = 200'

0 100 200 400

FOR REVIEW ONLY

COUNTY APPROVED CHANGES			
No.	Description	Approved by	Date
	ORIGINAL		X–X–XX

BENCHMARK

DESCRIPTION: COTTONWOOD GOLF COURSE
LOCATION: NAD 83, EPOCH 1998.50, ZONE 6, GEOID 3
RECORD FROM: ROS 16512
ELEVATION: 488.50 FEET DATUM: NGVD 29

PERMITS

HABITAT LOSS PERMIT NO.
INDUSTRIAL GENERAL PERMIT WDID NO.
MAJOR USE PERMIT
RECLAMATION PLAN NO.
PUBLIC IMPROVEMENT PLAN NO.
LOMR NO.
404 PERMIT NO.
401 PERMIT NO.
1602 PERMIT NO.

PRIVATE CONTRACT

SHEET 5 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 11 SHEETS

RECLAMATION PLAN FOR:

COTTONWOOD SAND MINING PROJECT

CALIFORNIA COORDINATE INDEX: 210–1791

Approved COUNTY ENGINEER BY: Date

Engineer of work
WAYNE W. CHANG R.C.E. 46548

Grading Permit No.

ENGINEER'S NAME: CHANG CONSULTANTS
PHONE NO. (858) 692–0760

FILE NO.

7/15/2024 8:22 PM

NOTES:

1. NEW ACCESS POINTS WILL REQUIRE OBTAINING AND ENCROACHMENT PERMIT FROM THE COUNTY. A DESIGN WILL BE SUBMITTED WITH THE ENCROACHMENT PERMIT APPLICATION.
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3. AT&T – THE AT&T POLES ALONG EXISTING GOLF COURSE PARKING LOT SHALL BE REMOVED AND THE LINES RELOCATED TO THE POWER POLES ON THE NORTH SIDE IF WILLOW GLEN DRIVE.
4. GAS LINE – GRADING SHALL MAINTAIN 10' MINIMUM SETBACK FROM EXISTING GAS LINE MOUNTED ON THE EAST SIDE OF THE STEELE CANYON ROAD BRIDGE.

SEE SHEET 11 FOR PROPERTY LINE DIMENSIONS

EXISTING ACCESS POINT TO BE GATED WITH TYPE ACCEPTABLE TO COUNTY. GATE WILL BE PLACED 20' FROM WILLOW GLEN TO ALLOW VEHICLE PARKING AT GATE. STREET TREES TO BE ADDED ALONG ACCESS DRIVEWAY.

FEMA FLOODWAY
EX. POWER LINE TO REMAIN (PROTECT IN PLACE)
100 YEAR FLOODPLAIN
WELL (TO REMAIN)
GROUTED LIGHT CLASS RIPRAP (2' THICK) OVER ½" GRAVEL FILTER BLANKET (1' THICK)
WELL (TO BE REMOVED)
WILLOW GLEN DRIVE
LIMIT OF OVEREXCAVATION PIT
16' CONVEYOR ACCESS ROAD
PERIMETER FENCING. (TYPICAL)
LODGE POLE FENCING (TYPICAL)
APPROXIMATE LOCATION OF PROPOSED 5' WIDE TRAIL
CONVEYOR ALIGNMENT
PUBLIC PATHWAY
PROPOSED LOW FLOW CHANNEL
LIMITS OF LANDSCAPE (TYPICAL)
DEMO. EX. BLDGS (TYPICAL)
STAGING AREA
16' WIDE TEMP CROSSING
MUP BOUNDARY (TYPICAL)
PERIMETER FENCING (TYPICAL)
OLD STAGE ROAD/ IVANHOE RANCH MULTI-USE TRAIL
LIMITS OF WILLOW DRIVE RIGHT-OF-WAY
PROPOSED TREE WELLS (30' DIAMETER MATURE CANOPY) PER TREE WELL DETAIL ON SHEET 3.
SDG&E TOWER PAD
20' WIDE ACCESS RAMP 14% MAX
APPROXIMATE 20' WIDE ACCESS ROAD
24' WIDE ACCESS RAMP 10% MAX
PROPOSED RIPRAP TO BE CONSTRUCTED ACROSS EXISTING CHANNEL BED TO MAINTAIN CONTINUITY OF GRADE CONTROL
STEELE CANYON ROAD BRIDGE
STEELE CANYON ROAD
14' WIDE ACCESS RAMP, 10% MAX
20' WIDE ACCESS RAMP, 10% MAX
TEMPORARY ACCESS LOCATION 2 ACCESS TO BE GATED WITH TYPE ACCEPTABLE TO COUNTY

SCALE: 1" = 200'
0 100 200 400

FOR REVIEW ONLY

COUNTY APPROVED CHANGES			
No.	Description	Approved by	Date
	ORIGINAL		X-X-XX

PERMITS

HABITAT LOSS PERMIT NO.
INDUSTRIAL GENERAL PERMIT WDID NO.
MAJOR USE PERMIT
RECLAMATION PLAN NO.
PUBLIC IMPROVEMENT PLAN NO.
LOMR NO.
404 PERMIT NO.
401 PERMIT NO.
1602 PERMIT NO.

BENCHMARK

DESCRIPTION: COTTONWOOD GOLF COURSE
LOCATION: NAD 83, EPOCH 1998.50, ZONE 6, GEOID 3
RECORD FROM: ROS 16512
ELEVATION: 488.50 FEET DATUM: NGVD 29

PRIVATE CONTRACT

SHEET 6 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 11 SHEETS

RECLAMATION PLAN FOR:

COTTONWOOD SAND MINING PROJECT

CALIFORNIA COORDINATE INDEX: 210-1791

Approved COUNTY ENGINEER
BY:
Date

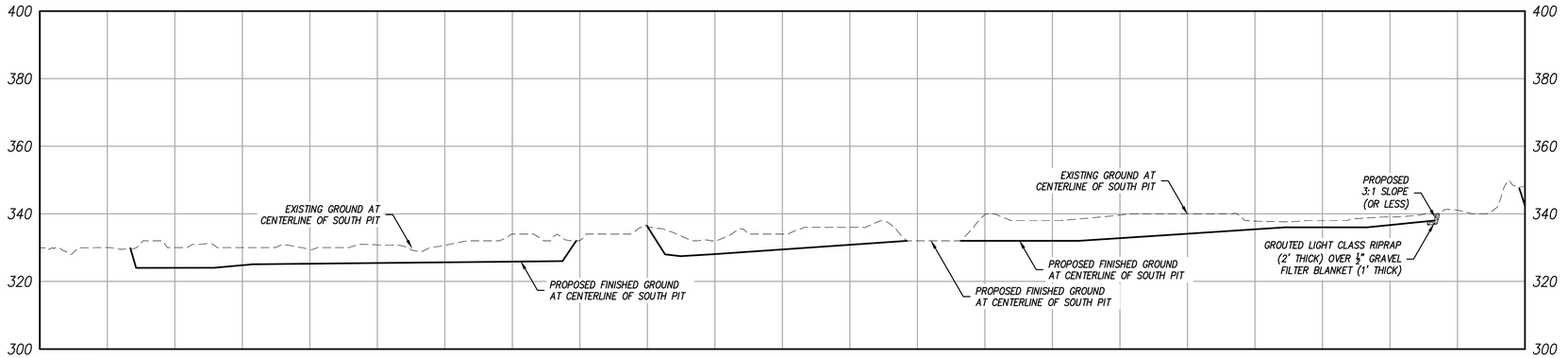
Engineer of work
WAYNE W. CHANG R.C.E. 46548

Grading Permit No.

ENGINEER'S NAME: CHANG CONSULTANTS
PHONE NO. (858) 692-0760

FILE NO.

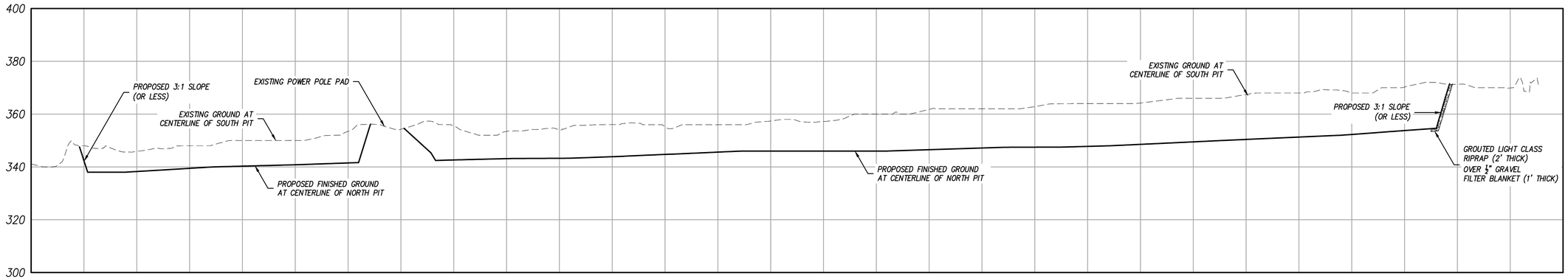
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SECTION A-A
SCALE HORIZ: 1" = 200' VERT: 1"=20'

UTILITY NOTE:

CAUTION: ENERGIZED OVERHEAD CONDUCTORS, ELEVATION VARIES, MUST MAINTAIN 20' RADIAL CLEARANCE, STANDBY LINEMAN IS REQUIRED FOR SAFETY WATCH FOR THE PROPOSED SAND MINING PROJECT COTTONWOOD. PROTECT IN PLACE EXISTING LATTICE TOWERS, POLES, GUY WIRES & ANCHORS FOR THE PROPOSED SAND MINING PROJECT COTTONWOOD PROJECT. CONTACT DIVERSIFIED UTILITY SERVICES INC. (858-278-2880) 30 DAYS IN ADVANCE OF CONSTRUCTION TO SCHEDULE STANDBY. NO GRADING WITHIN 20' OF EXISTING STEEL LATTICE TOWER FOUNDATIONS & NO GRADING WITHIN 30' OF EXISTING STEEL POLE FOUNDATION.



SECTION B-B
SCALE HORIZ: 1" = 200' VERT: 1"=20'

SCALE: 1" = 200'

0 100 200 400

FOR REVIEW ONLY

COUNTY APPROVED CHANGES			
No.	Description	Approved by	Date
	ORIGINAL		X-X-XX

BENCHMARK

DESCRIPTION: COTTONWOOD GOLF COURSE
LOCATION: NAD 83, EPOCH 1998.50, ZONE 6, GEOID 3
RECORD FROM: ROS 16512
ELEVATION: 488.50 FEET DATUM: NGVD 29

PERMITS

HABITAT LOSS PERMIT NO.
INDUSTRIAL GENERAL PERMIT WDID NO.
MAJOR USE PERMIT
RECLAMATION PLAN NO.
PUBLIC IMPROVEMENT PLAN NO.
LOMR NO.
404 PERMIT NO.
401 PERMIT NO.
1602 PERMIT NO.

PRIVATE CONTRACT

SHEET 7 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 11 SHEETS

SITE CROSS-SECTIONS FOR:

COTTONWOOD SAND MINING PROJECT

CALIFORNIA COORDINATE INDEX: 210-1791

Approved
COUNTY ENGINEER
BY:
Date

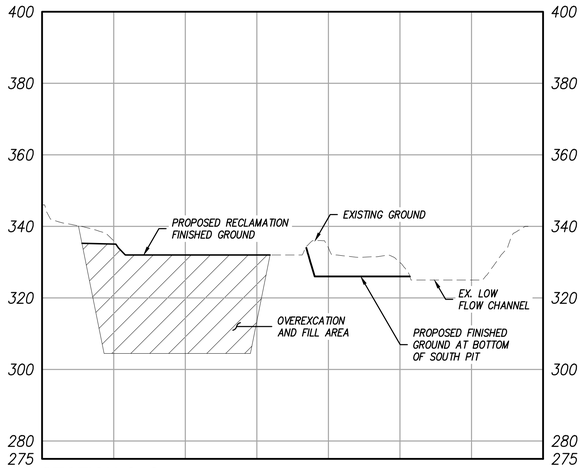
Engineer of work
WAYNE W. CHANG R.C.E. 46548

Grading Permit No.

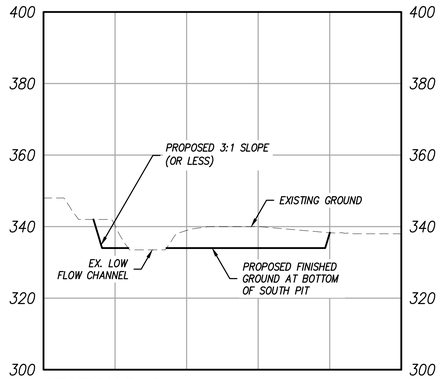
ENGINEER'S NAME: CHANG CONSULTANTS
PHONE NO. (858) 692-0760

FILE NO.

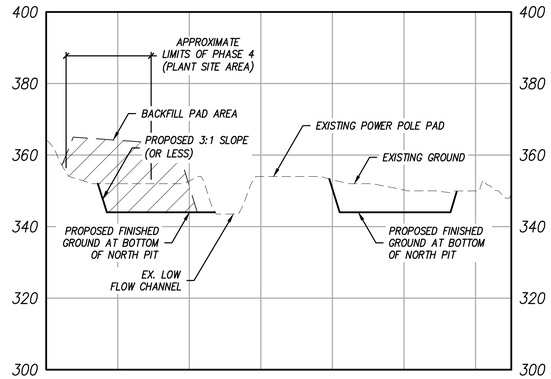
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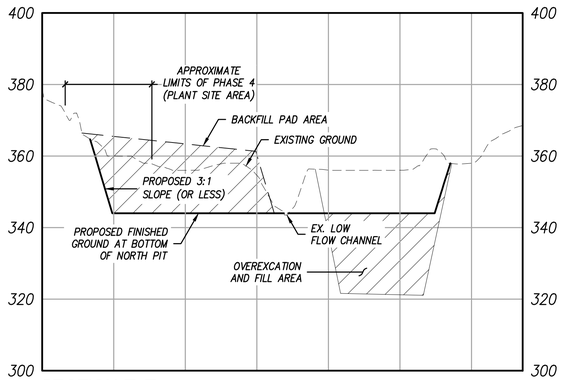
SECTION C-C
SCALE HORIZ: 1" = 200' VERT: 1"=20'



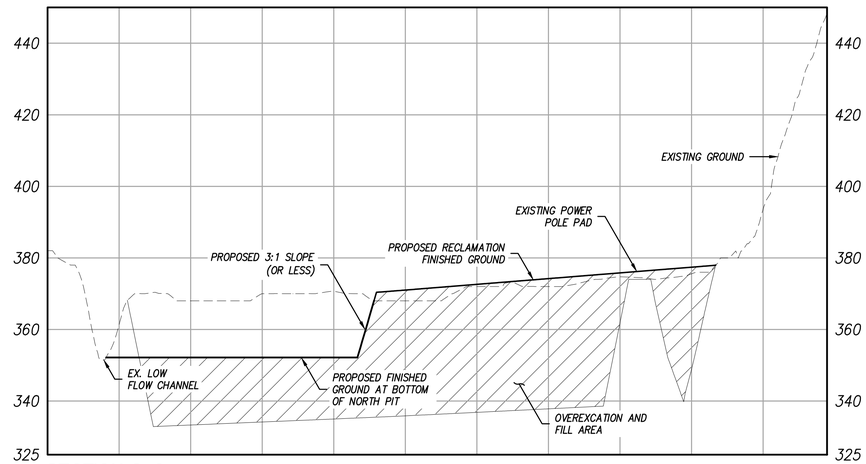
SECTION D-D
SCALE HORIZ: 1" = 200' VERT: 1"=20'



SECTION E-E
SCALE HORIZ: 1" = 200' VERT: 1"=20'



SECTION F-F
SCALE HORIZ: 1" = 200' VERT: 1"=20'



SECTION G-G
SCALE HORIZ: 1" = 200' VERT: 1"=20'

UTILITY NOTE:

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FOR REVIEW ONLY

SCALE: 1" = 200'

0 100 200 400

PERMITS

HABITAT LOSS PERMIT NO.
INDUSTRIAL GENERAL PERMIT WDID NO.
MAJOR USE PERMIT
RECLAMATION PLAN NO.
PUBLIC IMPROVEMENT PLAN NO.
LOMR NO.
404 PERMIT NO.
401 PERMIT NO.
1602 PERMIT NO.

PRIVATE CONTRACT

SHEET 8 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 11 SHEETS

SITE CROSS-SECTIONS FOR:

COTTONWOOD SAND MINING PROJECT

CALIFORNIA COORDINATE INDEX: 210-1791

COUNTY APPROVED CHANGES

No.	Description	Approved by	Date
	ORIGINAL		X-X-XX

BENCHMARK

DESCRIPTION: COTTONWOOD GOLF COURSE
LOCATION: NAD 83, EPOCH 1998.50, ZONE 6, GEOID 3
RECORD FROM: ROS 16512
ELEVATION: 488.50 FEET DATUM: NGVD 29

Approved
COUNTY ENGINEER
BY:
Date

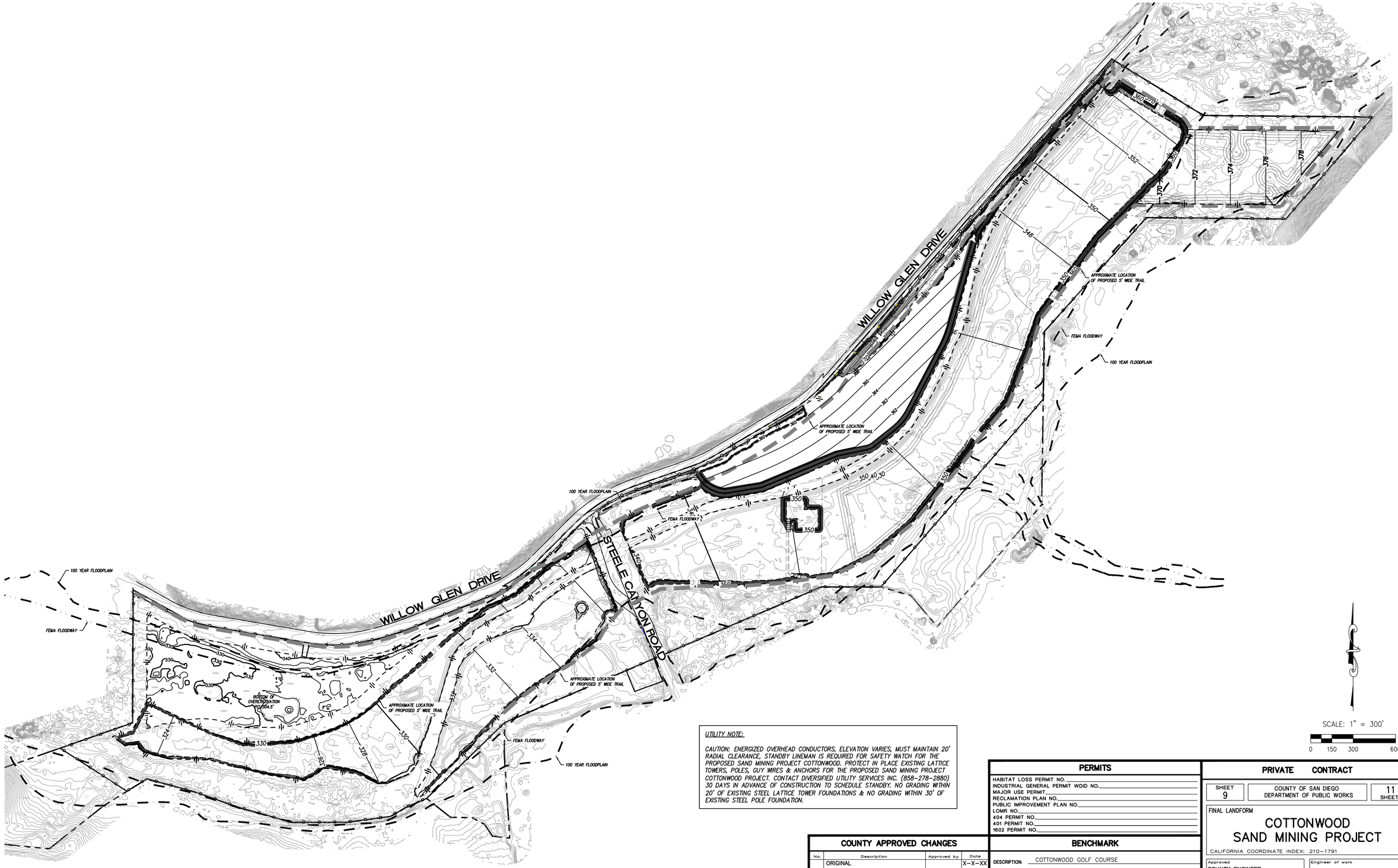
Engineer of work
WAYNE W. CHANG R.C.E. 46548

Grading Permit No.

ENGINEER'S NAME: CHANG CONSULTANTS
PHONE NO. (858) 692-0760

FILE NO.

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FOR REVIEW ONLY

SCALE: 1" = 300'

0 150 300 600

UTILITY NOTE:

CAUTION: ENERGIZED OVERHEAD CONDUCTORS, ELEVATION VARIES, MUST MAINTAIN 20' RADIAL CLEARANCE, STANDBY LINEMAN IS REQUIRED FOR SAFETY WATCH FOR THE PROPOSED SAND MINING PROJECT COTTONWOOD. PROTECT IN PLACE EXISTING LATTICE TOWERS, POLES, GUY WIRES & ANCHORS FOR THE PROPOSED SAND MINING PROJECT COTTONWOOD PROJECT. CONTACT DIVERSIFIED UTILITY SERVICES INC. (858-278-2880) 30 DAYS IN ADVANCE OF CONSTRUCTION TO SCHEDULE STANDBY. NO GRADING WITHIN 20' OF EXISTING STEEL LATTICE TOWER FOUNDATIONS & NO GRADING WITHIN 30' OF EXISTING STEEL POLE FOUNDATION.

COUNTY APPROVED CHANGES

No.	Description	Approved by	Date
	ORIGINAL		X-X-XX

PERMITS

HABITAT LOSS PERMIT NO.
INDUSTRIAL GENERAL PERMIT WDID NO.
MAJOR USE PERMIT
RECLAMATION PLAN NO.
PUBLIC IMPROVEMENT PLAN NO.
LOMR NO.
404 PERMIT NO.
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BENCHMARK

DESCRIPTION: COTTONWOOD GOLF COURSE
LOCATION: NAD 83, EPOCH 1998.50, ZONE 6, GEOID 3
RECORD FROM: ROS 16512
ELEVATION: 488.50 FEET DATUM: NGVD 29

PRIVATE CONTRACT

SHEET 9 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 11 SHEETS

FINAL LANDFORM

COTTONWOOD SAND MINING PROJECT

CALIFORNIA COORDINATE INDEX: 210-1791

Approved
COUNTY ENGINEER
BY:
Date

Engineer of work
WAYNE W. CHANG R.C.E. 46548

Grading Permit No.

ENGINEER'S NAME: CHANG CONSULTANTS
PHONE NO. (858) 692-0760

FILE NO.

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RIPARIAN FOREST PLANT PALETTE
(15.39 acres)

Species	Common Name	Spacing on Center (feet)	Grouping Size	Number Per Acre
Container Plantings[1]				
Artemisia dracunculus	tarragon	5	5	100
Baccharis salicifolia	mule fat	6	10	200
Distichlis spicata	saltgrass	10	3	150
Iva hayesiana	San Diego marsh elder	5	5	120
Platanus racemosa	western sycamore	15	3	50
Populus fremonti ssp. *fremonti*	western cottonwood	15	5	50
Quercus agrifolia	California live oak	15	3	50
Rosa californica	California wild rose	5	3	100
Salix exigua	sand bar willow	8	5	120
Salix gooddingii	black willow	12	5	150
Salix laevigata	red willow	12	5	180
Salix lasiolepis	arroyo willow	12	5	180
Sambucus nigra	blue elderberry	10	3	50
			Total	**1,500**

Scientific Name	Common Name	% Purity/ Germination	Pounds Per Acre
Seed Mixture[1]			
Ambrosia psilostachya	western ragweed	45/45	4
Anemopsis californica	yerba mansa	55/80	1
Artemisia douglasiana	Douglas mugwort	15/40	3
Artemisia palmeri	Palmer's sagebrush	20/50	2
Baccharis salicifolia	mule fat	10/20	3
Baccharis sarothroides	broom baccharis	7/42	1
Bolboschoenus maritimus	alkali bulrush	90/60	1
Eleocharis macrostachys	pale spike-rush	95/60	1
Juncus acutus ssp. *leopoldii*	southwestern spiny rush	95/80	1
Juncus effusus var. *pacificus*	Pacific rush	95/60	0.5
Oenothera elata ssp. *hookeri*	evening primrose	98/84	0.5
Pluchea odorata	salt marsh fleabane	30/40	2
		Total	**20.0***

[1] The quantities and amount of container stock and seed to be order would be determined following reclamation of each phase/subphase based on the exact of area disturbed as part of mining activities. Substitutions require approval of the Restoration Specialist.

* No less than 20 lbs. per acre of seed shall be installed.

STREAMBED (EMERGENT WETLAND) SEED MIXTURE
(9.49 acres)

Scientific Name	Common Name	%Purity/ Germination	Pounds per Acre
Seed Mixture[1]			
Anemopsis californica	yerba mansa	55/80	1
Artemisia douglasiana	Douglas' sagewort	15/40	3
Bolboschoenus maritimus	alkali bulrush	90/60	1
Cyperus eragrostis	tall flatsedge	80/75	1
Eleocharis macrostachys	pale spike-rush	95/60	1
Erythranthe cardinalis (*Mimulus cardinalis*)	Cardinal monkey flower	5/64	0.5
Erythranthe guttata (*Mimulus guttatus*)	seep monkey flower	10/69	0.5
Euthamia occidentalis	western goldenrod	24/45	1
Juncus effusus var. *pacificus*	Pacific rush	95/60	0.5
Pluchea odorata	salt marsh fleabane	30/40	2
		Total	**11.5***

[1] The quantity of seed ordered for each phase/subphase will be determined based on the exact size of the area disturbed as part of mining activities. Substitutions require approval of the Restoration Specialist.

* No less than 10 lbs. per acre of seed shall be installed.

EROSION CONTROL SEED MIX
(97.90 acres)

Species	Common Name	Percent Purity/ Germination	Pounds Per Acre[1]
Ambrosia psilostachya	western ragweed	45/45	6
Bromus carinatus	California bromegrass	95/90	8
Vulpia microstachys	small fescue	98/75	20
Plantago insularis	plantain	90/80	20
		Total	**54***

[1] The final quantities and amount of container stock and seed to be order would be determined following reclamation of each phase/subphase based on the exact of area disturbed as part of mining activities. Substitutions require approval of the Restoration Specialist.

* No less than 50 lbs. per acre of seed shall be installed.

RIPARIAN SCRUB PLANT PALETTE
(84.84 acres)

Scientific Name	Common Name	Spacing on Center (ft.)	Grouping Size	Number Per Acre
Container Stock[1]				
Ambrosia pumila [2,3]	San Diego ambrosia	5	5	25
Artemisia dracunculus	tarragon	5	5	200
Asclepias fascicularis	narrow leaf milkweed	5	3	50
Baccharis salicifolia	mule fat	6	10	220
Croton californicus	California croton	5	5	200
Distichlis spicata	saltgrass	10	3	200
Ericameria palmeri var. *palmeri* [3]	Palmer's goldenbush	5	5	50
Iva hayesiana	San Diego marsh elder	5	5	200
Platanus racemosa	western sycamore	15	3	30
Populus fremonti ssp. *fremonti*	western cottonwood	15	3	30
Rosa californica	California wild rose	5	3	50
Salix exigua	sand bar willow	8	5	180
Salix gooddingii	black willow	12	5	100
Salix laevigata	red willow	12	5	30
Salix lasiolepis	arroyo willow	12	5	30
Sambucus nigra	blue elderberry	10	3	100
			Total	**1,695**

Scientific Name	Common Name	%Purity/ Germination	Pounds Per Acre
Seed Mixture[1]			
Ambrosia psilostachya	western ragweed	45/45	4
Artemisia douglasiana	Douglas' sagewort	15/40	3
Artemisia palmeri	Palmer's sagebrush	20/50	2
Baccharis salicifolia	mule fat	10/20	3
Baccharis sarothroides	broom baccharis	7/42	1
Bolboschoenus maritimus	alkali bulrush	90/60	1
Croton californicus	California croton	90/40	1
Eleocharis macrostachys	pale spike-rush	95/60	1
Isocoma menziesii	goldenbush	18/40	1
Juncus acutus ssp. *leopoldii*	southwestern spiny rush	95/80	1
Juncus effusus var. *pacificus*	Pacific rush	95/60	0.5
Oenothera elata ssp. *hookeri*	evening primrose	98/84	0.5
Pluchea odorata	salt marsh fleabane	30/40	2
		Total	**21.0***

[1] The quantity of seed ordered for each phase/subphase will be determined based on the exact size of the area disturbed as part of mining activities. Substitutions require approval of the Restoration Specialist.

[2] If available at a nursery; should be installed in the higher elevation portions of this habitat (i.e., closer to the upland slopes).

[3] Special status species.

* No less than 20 lbs. per acre of seed shall be installed.

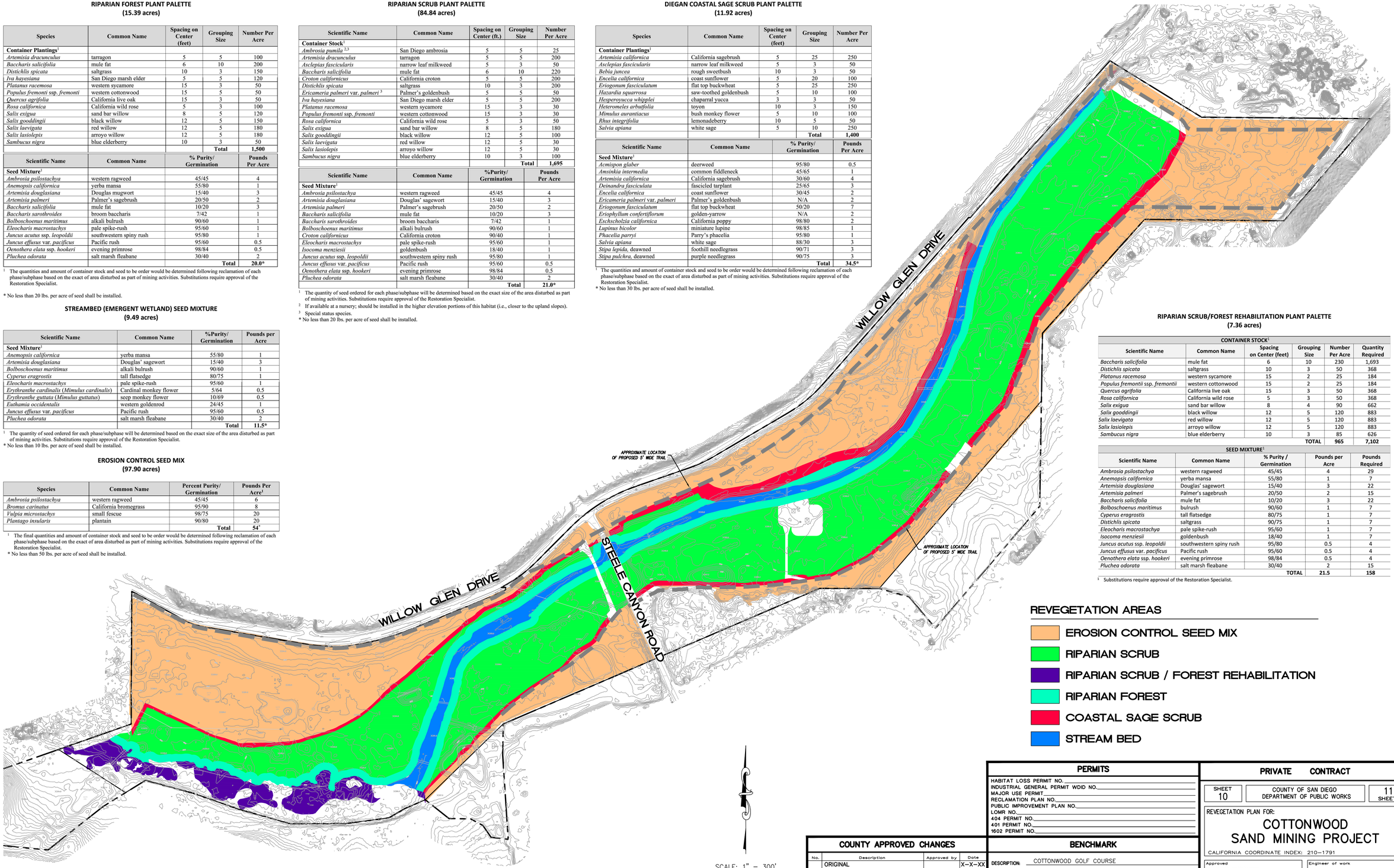
DIEGAN COASTAL SAGE SCRUB PLANT PALETTE
(11.92 acres)

Species	Common Name	Spacing on Center (feet)	Grouping Size	Number Per Acre
Container Plantings[1]				
Artemisia californica	California sagebrush	5	25	250
Asclepias fascicularis	narrow leaf milkweed	5	3	50
Bebbia juncea	rough sweetbush	10	3	50
Encelia californica	coast sunflower	5	20	100
Eriogomum fasciculatum	flat top buckwheat	5	25	250
Hazardia squarrosa	saw-toothed goldenbush	5	10	100
Hesperoyucca whipplei	chaparral yucca	3	3	50
Heteromeles arbutfolia	toyon	10	3	150
Mimulus aurantiacus	bush monkey flower	5	10	100
Rhus integrifolia	lemonadeberry	10	5	50
Salvia apiana	white sage	5	10	250
			Total	**1,400**

Scientific Name	Common Name	% Purity/ Germination	Pounds Per Acre
Seed Mixture[1]			
Acmispon glaber	deerweed	95/80	0.5
Amsinkia intermedia	common fiddleneck	45/65	1
Artemisia californica	California sagebrush	30/60	4
Deinandra fasciculata	fascicled tarplant	25/65	3
Encelia californica	coast sunflower	30/45	2
Ericameria palmeri var. *palmeri*	Palmer's goldenbush	N/A	2
Eriogonum fasciculatum	flat top buckwheat	50/20	7
Eriophyllum confertiflorum	golden-yarrow	N/A	2
Eschscholzia californica	California poppy	98/80	2
Lupinus bicolor	miniature lupine	98/85	1
Phacelia parryi	Parry's phacelia	95/80	1
Salvia apiana	white sage	88/30	3
Stipa lepida, deawned	foothill needlegrass	90/71	3
Stipa pulchra, deawned	purple needlegrass	90/75	3
		Total	**34.5***

[1] The quantities and amount of container stock and seed to be order would be determined following reclamation of each phase/subphase based on the exact of area disturbed as part of mining activities. Substitutions require approval of the Restoration Specialist.

* No less than 30 lbs. per acre of seed shall be installed.



RIPARIAN SCRUB/FOREST REHABILITATION PLANT PALETTE
(7.36 acres)

CONTAINER STOCK[1]					
Scientific Name	**Common Name**	**Spacing on Center (feet)**	**Grouping Size**	**Number Per Acre**	**Quantity Required**
Baccharis salicifolia	mule fat	6	10	230	1,693
Distichlis spicata	saltgrass	10	3	50	368
Platanus racemosa	western sycamore	15	2	25	184
Populus fremontii ssp. *fremontii*	western cottonwood	15	2	25	184
Quercus agrifolia	California live oak	15	3	50	368
Rosa californica	California wild rose	5	3	50	368
Salix exigua	sand bar willow	8	4	90	662
Salix gooddingii	black willow	12	5	120	883
Salix laevigata	red willow	12	5	120	883
Salix lasiolepis	arroyo willow	12	5	120	883
Sambucus nigra	blue elderberry	10	3	85	626
			TOTAL	**965**	**7,102**

SEED MIXTURE[1]				
Scientific Name	**Common Name**	**% Purity / Germination**	**Pounds per Acre**	**Pounds Required**
Ambrosia psilostachya	western ragweed	45/45	4	29
Anemopsis californica	yerba mansa	55/80	1	7
Artemisia douglasiana	Douglas' sagewort	15/40	3	22
Artemisia palmeri	Palmer's sagebrush	20/50	2	15
Baccharis salicifolia	mule fat	10/20	3	22
Bolboschoenus maritimus	bulrush	90/60	1	7
Cyperus eragrostis	tall flatsedge	80/75	1	7
Distichlis spicata	saltgrass	90/75	1	7
Eleocharis macrostachya	pale spike-rush	95/60	1	7
Isocoma menziesii	goldenbush	18/40	1	7
Juncus acutus ssp. *leopoldii*	southwestern spiny rush	95/80	0.5	4
Juncus effusus var. *pacificus*	Pacific rush	95/60	0.5	4
Oenothera elata ssp. *hookeri*	evening primrose	98/84	0.5	4
Pluchea odorata	salt marsh fleabane	30/40	2	15
		TOTAL	**21.5**	**158**

[1] Substitutions require approval of the Restoration Specialist.

REVEGETATION AREAS

- EROSION CONTROL SEED MIX
- RIPARIAN SCRUB
- RIPARIAN SCRUB / FOREST REHABILITATION
- RIPARIAN FOREST
- COASTAL SAGE SCRUB
- STREAM BED

SCALE: 1" = 300'

0 150 300 600

FOR REVIEW ONLY

COUNTY APPROVED CHANGES

No.	Description	Approved by	Date
	ORIGINAL		X-X-XX

PERMITS

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BENCHMARK

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LOCATION: NAD 83, EPOCH 1998.50, ZONE 6, GEOID 3
RECORD FROM: ROS 16512
ELEVATION: 488.50 FEET DATUM: NGVD 29

PRIVATE CONTRACT

SHEET 10 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 11 SHEETS

REVEGETATION PLAN FOR:

COTTONWOOD SAND MINING PROJECT

CALIFORNIA COORDINATE INDEX: 210-1791

Approved COUNTY ENGINEER BY: Date

Engineer of work WAYNE W. CHANG R.C.E. 46548

Grading Permit No.

ENGINEER'S NAME: CHANG CONSULTANTS
PHONE NO. (858) 692-0760

FILE NO.

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THIS SURVEY WAS BASED ON A PRELIMINARY TITLE REPORT ISSUED BY FIRST AMERICAN TITLE COMPANY, AS ORDER NO. 1235014-20, DATED FEBRUARY 12, 2002. EFFECTS OF AGREEMENTS, PERMITS, LIENS, ASSESSMENTS, LEASES, COVENANTS, AND/OR RESTRICTIONS APPEARING IN SAID POLICY AS ITEM NOS. 1-4, 11, 12, 18, 22-24, 26, 29, 32-34, 36, 38, 39, 44, 47, 54, 55, 57, 63, 65, 66, AND 70-72, INCLUSIVE, ARE NOT NOTED ON THIS SURVEY.

(5) RIGHTS OF THE PUBLIC IN AND TO ANY PORTION OF THE HEREIN DESCRIBED PROPERTY SHOWN AS LYING WITHIN ROADS, STREETS OR HIGHWAYS.

(6) AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS RECORDED APRIL 29, 1914 IN BOOK 651, PAGE 63 OF DEEDS. THE EXACT LOCATION AND EXTENT OF SAID EASEMENT CANNOT BE DETERMINED FROM RECORD AND IS NOT PLOTTED HEREON.

(7) AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES RECORDED MAY 10, 1916 IN BOOK 708, PAGE 297 OF DEEDS. THE EXACT LOCATION AND EXTENT OF SAID EASEMENT CANNOT BE DETERMINED FROM RECORD AND IS NOT PLOTTED HEREON.

(8) AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS RECORDED MAY 10, 1916 IN BOOK 708, PAGE 298 OF DEEDS. THE EXACT LOCATION AND EXTENT OF SAID EASEMENT CANNOT BE DETERMINED FROM RECORD AND IS NOT PLOTTED HEREON.

(9) AN EASEMENT FOR PUBLIC ROAD AND INCIDENTAL PURPOSES RECORDED MARCH 28, 1922 IN BOOK 751, PAGE 264 OF DEEDS.

(10) AN EASEMENT FOR ROAD PURPOSES AND INCIDENTAL PURPOSES RECORDED MARCH 28, 1928 IN BOOK 751, PAGE 265 OF DEEDS.

(13) THE PRIVILEGE AND RIGHT TO EXTEND DRAINAGE STRUCTURES, EXCAVATION AND EMBANKMENT SLOPES RECORDED OCTOBER 23, 1940 IN BOOK 1084, PAGE 266 OF OFFICIAL RECORDS.

(14) AN EASEMENT AND RIGHT OF WAY FOR PUBLIC ROAD PURPOSES RECORDED APRIL 9, 1942, IN BOOK 1324, PAGE 363 OF OFFICIAL RECORDS.

(15) AN EASEMENT AND RIGHT OF WAY FOR PUBLIC ROAD PURPOSES RECORDED MAY 1, 1942, IN BOOK 1341, PAGE 258 OF OFFICIAL RECORDS.

(16) AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS RECORDED NOVEMBER 10, 1948 IN BOOK 3013, PAGE 199 OF OFFICIAL RECORDS.

(17) AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS RECORDED APRIL 11, 1951 IN BOOK 4048, PAGE 482 OF OFFICIAL RECORDS. NO WIDTH SPECIFIED IN SAID DOCUMENT.

(19) AN EASEMENT FOR RIGHT OF WAY PURPOSES IN, UPON, OVER, UNDER AND ACROSS THE LANDS HEREINAFTER DESCRIBED, TO ERECT, CONSTRUCT, RECONSTRUCT, REPLACE, MAINTAIN AND USE A LINE OR INDEPENDENT LINES OF POLES AND/OR STEEL TOWERS AND WIRES AND/OR CABLES SUSPENDED THEREON AND SUPPORTED THEREBY, AND UNDERGROUND CONDUITS, CABLES, VAULTS AND MANHOLES, FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICITY AND FOR ALL OTHER PURPOSES CONNECTED THEREWITH, AND FOR TELEPHONE, SIGNAL AND COMMUNICATION PURPOSES, INCLUDING GUYS, ANCHORAGE, CROSSARMS, BRACES AND ALL OTHER APPLIANCES AND FIXTURES FOR USE IN CONNECTION THEREWITH AND ALSO FOR PIPELINES FOR ANY AND ALL PURPOSES, TOGETHER WITH THEIR NECESSARY FIXTURES AND APPURTENANCES, AT SUCH LOCATIONS AND ELEVATIONS, UPON, ALONG, OVER AND UNDER THE HEREINAFTER DESCRIBED RIGHT OF WAY AS GRANTEE MAY NOW OR HEREAFTER DEEM CONVENIENT AND NECESSARY FROM TIME TO TIME, TOGETHER WITH THE RIGHT OF INGRESS THERETO AND EGRESS THEREFROM, TO AND ALONG SAID RIGHT OF WAY BY A PRACTICAL ROUTE OR ROUTES IN, UPON, OVER AND ACROSS THE HEREINAFTER DESCRIBED LANDS, TOGETHER WITH THE RIGHT TO CLEAR AND KEEP CLEAR SAID RIGHT OF WAY FROM EXPLOSIVES, BUILDINGS, STRUCTURES AND INFLAMMABLE MATERIALS FOR PROTECTION FROM FIRE AND OTHER HAZARDS AND INCIDENTAL PURPOSES RECORDED FEBRUARY 9, 1960 AS FILE NO. 26567 OF OFFICIAL RECORDS.

(20) AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS RECORDED APRIL 6, 1960 AS FILE NO. 70178 OF OFFICIAL RECORDS.

(21) AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS RECORDED OCTOBER 24, 1960 AS FILE NO. 210673 OF OFFICIAL RECORDS.

(25) AN EASEMENT AND RIGHT OF WAY FOR PUBLIC ROAD PURPOSES RECORDED MARCH 29, 1962 AS FILE NO. 53378 OFFICIAL RECORDS.

(27) AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS RECORDED JUNE 8, 1962 AS FILE NO. 98151 OF OFFICIAL RECORDS.

(28) AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS RECORDED SEPTEMBER 23, 1963 AS FILE NO. 169818 OF OFFICIAL RECORDS. NOT PLOTTABLE

(30) AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS RECORDED OCTOBER 1, 1963 AS FILE NO. 175212 OF OFFICIAL RECORDS.

(31) THE PRIVILEGE AND RIGHT TO EXTEND DRAINAGE STRUCTURES, EXCAVATION AND EMBANKMENT SLOPES RECORDED FEBRUARY 14, 1964 AS FILE NO. 28666 AND 28667 OF OFFICIAL RECORDS.

(35) AN EASEMENT FOR PIPELINES AND INCIDENTAL PURPOSES RECORDED MARCH 31, 1966 AS FILE NO. 54103 OF OFFICIAL RECORDS.

(37) AN EASEMENT FOR PIPELINES FOR WELLS AND INCIDENTAL PURPOSES RECORDED MARCH 31, 1966 AS FILE NO. 54104 OF OFFICIAL RECORDS. THE EXACT LOCATION AND EXTENT OF SAID EASEMENT CANNOT BE DETERMINED FROM RECORD AND IS NOT PLOTTED HEREON.

(40) AN EASEMENT FOR DRAINAGE AND INCIDENTAL PURPOSES AS DELINEATED AND DESIGNATED ON MAP 9553.

(41) AN EASEMENT FOR OPEN SPACE AND INCIDENTAL PURPOSES AS DELINEATED AND DESIGNATED ON MAP 9553.

(42) AN EASEMENT FOR PIPELINES FOR WELLS AND INCIDENTAL PURPOSES RECORDED JUNE 27, 1978 AS FILE NO. 78-267214 OF OFFICIAL RECORDS.

(43) AN EASEMENT FOR DRAINAGE CHANNEL AND INCIDENTAL PURPOSES RECORDED OCTOBER 8, 1979 AS FILE NO. 79-419917 OF OFFICIAL RECORDS.

(45) AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS RECORDED AUGUST 12, 1980 AS FILE NO. 80-256258 OF OFFICIAL RECORDS.

(46) AN EASEMENT FOR ELECTRICAL, GAS AND COMMUNICATION SYSTEMS, TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS AND INCIDENTAL PURPOSES RECORDED OCTOBER 7, 1980 AS FILE NO. 80-329857 OF OFFICIAL RECORDS. THE EXACT LOCATION AND EXTENT OF SAID EASEMENT CANNOT BE DETERMINED FROM RECORD AND IS NOT PLOTTED HEREON.

(48) THE PRIVILEGE AND RIGHT TO EXTEND DRAINAGE STRUCTURES AS GRANTED IN IRREVOCABLE OFFER RECORDED JULY 20, 1984 AS FILE NO. 84-275597 AND WAS ACCEPTED JUNE 3, 1992 AS FILE NO. 1992-0344626 BOTH OF OFFICIAL RECORDS.

(49) AN IRREVOCABLE OFFER TO DEDICATE REAL PROPERTY FOR PUBLIC RIGHT OF WAY PURPOSES RECORDED JULY 20, 1984 AS FILE NO. 84-275597 OF OFFICIAL RECORDS.

(50) AN IRREVOCABLE OFFER TO DEDICATE REAL PROPERTY FOR PUBLIC RIGHT OF WAY PURPOSES RECORDED JULY 20, 1984 AS FILE NO. 84-275598 OF OFFICIAL RECORDS.

(51) AN IRREVOCABLE OFFER TO DEDICATE REAL PROPERTY FOR PUBLIC RIGHT OF WAY PURPOSES RECORDED JULY 20, 1984 AS FILE NO. 84-275599 OF OFFICIAL RECORDS.

(52) AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS RECORDED AUGUST 3, 1984 AS FILE NO. 84-295705 OF OFFICIAL RECORDS.

(53) AN EASEMENT FOR DRAINAGE SYSTEM AND INCIDENTAL PURPOSES RECORDED AUGUST 20, 1984 AS FILE NO. 84-317325 OF OFFICIAL RECORDS.

(56) AN EASEMENT FOR DRAINAGE AND INCIDENTAL PURPOSES RECORDED MAY 1, 1985 AS FILE NO. 85-152525 OF OFFICIAL RECORDS.

(58) AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS RECORDED SEPTEMBER 30, 1986 AS FILE NO. 86-435379 OF OFFICIAL RECORDS.

(59) AN EASEMENT FOR THE INSTALLATION, CONSTRUCTION, MAINTENANCE, REPAIR, REPLACEMENT, RECONSTRUCTION AND INSPECTION OF AN ENCLOSED OR UNENCLOSED FLOOD DRAINAGE CHANNEL AND ALL STRUCTURES INCIDENTAL THERETO, AND FOR THE FLOWAGE OF ANY WATERS AND INCIDENTAL PURPOSES RECORDED DECEMBER 30, 1987 AS FILE NO. 87-713689 OF OFFICIAL RECORDS.

(60) AN EASEMENT FOR PUBLIC HIGHWAY AND INCIDENTAL PURPOSES RECORDED MARCH 24, 1988 AS FILE NO. 88-134732 OF OFFICIAL RECORDS. SAID INSTRUMENT ALSO GRANTS THE PRIVILEGE AND RIGHT TO EXTEND AND MAINTAIN DRAINAGE STRUCTURES AND EXCAVATION AND EMBANKMENT SLOPES.

(61) AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS RECORDED AUGUST 22, 1988 AS FILE NO. 88-416623 OF OFFICIAL RECORDS. NOT PLOTTABLE.

(62) AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS RECORDED DECEMBER 7, 1988 AS FILE NO. 88-628567 OF OFFICIAL RECORDS.

(64) AN EASEMENT FOR SLOPE, PUBLIC HIGHWAY AND INCIDENTAL PURPOSES RECORDED AUGUST 28, 1990 AS FILE NO. 90-468529 OF OFFICIAL RECORDS.

(67) AN EASEMENT FOR LAYING UNDERGROUND WATER PIPELINES AND LATERALS, MAIN SEWER LINES, SEWER TRUNK LINES, COLLECTION LINES AND LATERALS, SEWER MANHOLES AND OTHER UNDERGROUND AND SURFACE STRUCTURES APPURTENANT TO SAID WATER AND SEWER LINES AND INCIDENTAL PURPOSES RECORDED JUNE 26, 1991 AS FILE NO. 91-0309793 OF OFFICIAL RECORDS.

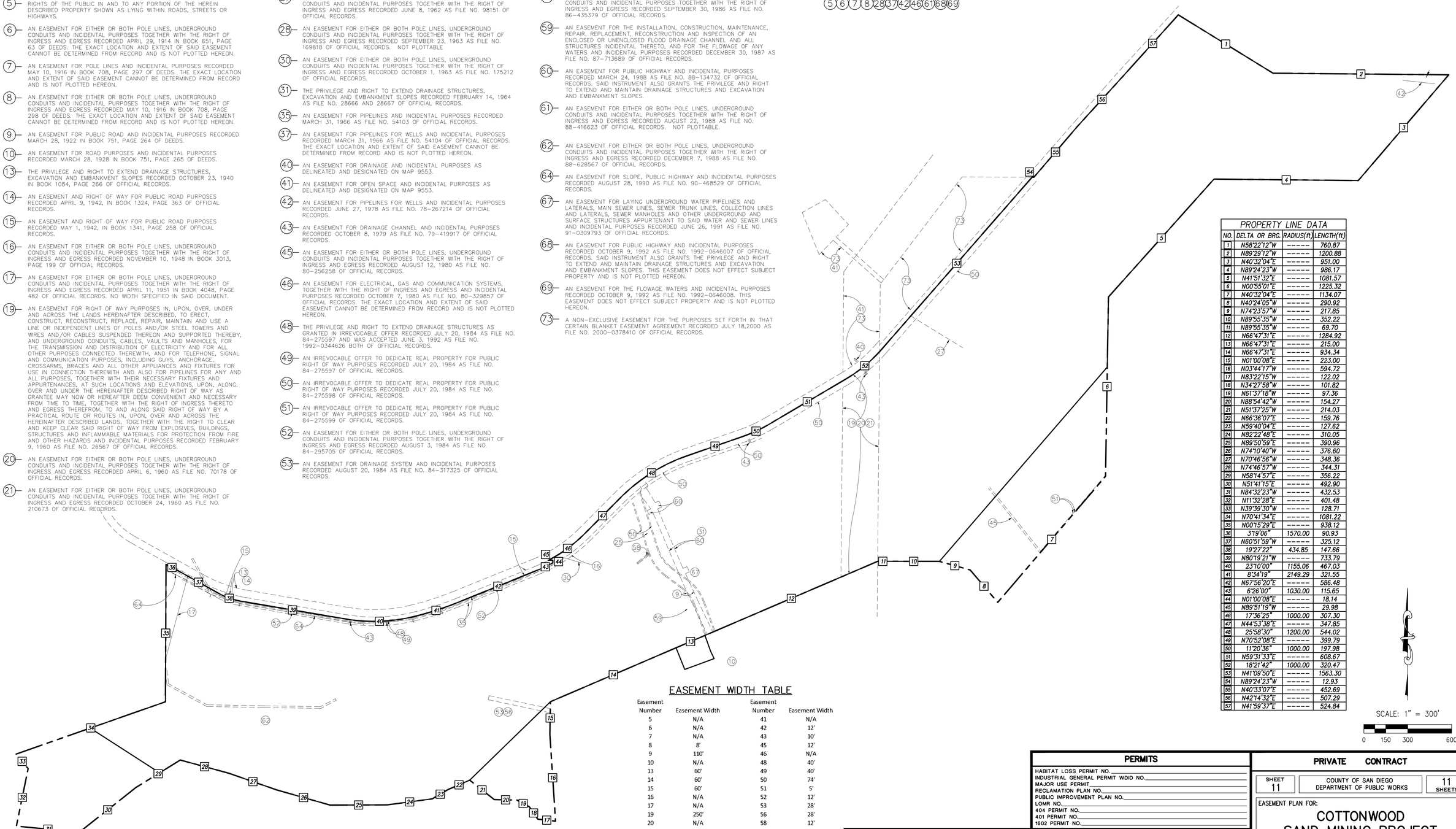
(68) AN EASEMENT FOR PUBLIC HIGHWAY AND INCIDENTAL PURPOSES RECORDED OCTOBER 9, 1992 AS FILE NO. 1992-0646007 OF OFFICIAL RECORDS. SAID INSTRUMENT ALSO GRANTS THE PRIVILEGE AND RIGHT TO EXTEND AND MAINTAIN DRAINAGE STRUCTURES AND EXCAVATION AND EMBANKMENT SLOPES. THIS EASEMENT DOES NOT EFFECT SUBJECT PROPERTY AND IS NOT PLOTTED HEREON.

(69) AN EASEMENT FOR THE FLOWAGE WATERS AND INCIDENTAL PURPOSES RECORDED OCTOBER 9, 1992 AS FILE NO. 1992-0646008. THIS EASEMENT DOES NOT EFFECT SUBJECT PROPERTY AND IS NOT PLOTTED HEREON.

(73) A NON-EXCLUSIVE EASEMENT FOR THE PURPOSES SET FORTH IN THAT CERTAIN BLANKET EASEMENT AGREEMENT RECORDED JULY 18,2000 AS FILE NO. 2000-0378410 OF OFFICIAL RECORDS.

NON-PLOTTABLE EASEMENTS
THE EXACT LOCATION AND EXTENT OF SAID EASEMENT CANNOT BE DETERMINED FROM RECORD AND IS NOT PLOTTED HEREON.

(5) (6) (7) (8) (28) (37) (42) (46) (61) (68) (69)



PROPERTY LINE DATA

NO.	DELTA OR BRG.	RADIUS(ft)	LENGTH(ft)
1	N58°22'12"W	------	760.87
2	N89°29'12"W	------	1200.88
3	N40°32'04"E	------	951.00
4	N89°24'23"W	------	986.17
5	N41°51'32"E	------	1081.57
6	N00°55'01"E	------	1225.32
7	N40°32'04"E	------	1134.07
8	N40°24'05"W	------	290.92
9	N74°23'57"W	------	217.85
10	N89°55'35"W	------	352.22
11	N89°55'35"W	------	69.70
12	N66°47'31"E	------	1284.92
13	N66°47'31"E	------	215.00
14	N66°47'31"E	------	934.34
15	N01°00'08"E	------	223.00
16	N03°44'17"W	------	594.72
17	N83°22'15"W	------	122.02
18	N34°27'58"W	------	101.82
19	N61°37'18"W	------	97.36
20	N88°54'42"W	------	154.27
21	N51°37'25"W	------	214.03
22	N66°36'07"E	------	159.76
23	N59°40'04"E	------	127.62
24	N82°22'48"E	------	310.05
25	N89°50'59"E	------	390.96
26	N74°10'40"W	------	376.60
27	N70°46'56"W	------	348.36
28	N74°46'57"W	------	344.31
29	N58°14'57"E	------	356.22
30	N51°41'15"E	------	492.90
31	N84°32'23"W	------	432.53
32	N11°32'28"E	------	401.48
33	N39°39'30"W	------	128.71
34	N70°41'34"E	------	1081.22
35	N00°15'29"E	------	938.12
36	3°19'06"	1570.00	90.93
37	N60°51'59"W	------	325.12
38	19°27'22"	434.85	147.66
39	N80°19'21"W	------	733.79
40	23°10'00"	1155.06	467.03
41	8°34'19"	2149.29	321.55
42	N67°56'20"E	------	586.48
43	6°26'00"	1030.00	115.65
44	N01°00'08"E	------	18.14
45	N89°51'19"W	------	29.98
46	17°36'25"	1000.00	307.30
47	N44°53'38"E	------	347.85
48	25°58'30"	1200.00	544.02
49	N70°52'08"E	------	399.79
50	11°20'36"	1000.00	197.98
51	N59°31'33"E	------	608.67
52	18°21'42"	1000.00	320.47
53	N41°09'50"E	------	1563.30
54	N89°24'23"W	------	12.93
55	N40°33'07"E	------	452.69
56	N42°14'32"E	------	507.29
57	N41°59'37"E	------	524.84

SCALE: 1" = 300'

0 150 300 600

EASEMENT WIDTH TABLE

Easement Number	Easement Width	Easement Number	Easement Width
5	N/A	41	N/A
6	N/A	42	12'
7	N/A	43	10'
8	8'	45	12'
9	110'	46	N/A
10	N/A	48	40'
13	60'	49	40'
14	60'	50	74'
15	60'	51	5'
16	N/A	52	12'
17	N/A	53	28'
19	250'	56	28'
20	N/A	58	12'
21	250'	59	20'
25	60'	60	N/A
27	12'	61	4'
28	N/A	62	12'
30	5'	64	N/A
31	60'	67	20'
35	30'	68	N/A
37	15'	69	N/A
40	N/A	73	N/A

COUNTY APPROVED CHANGES

No.	Description	Approved by	Date
	ORIGINAL		X-X-XX

PERMITS

HABITAT LOSS PERMIT NO.
INDUSTRIAL GENERAL PERMIT WDID NO.
MAJOR USE PERMIT
RECLAMATION PLAN NO.
PUBLIC IMPROVEMENT PLAN NO.
LOMR NO.
404 PERMIT NO.
401 PERMIT NO.
1602 PERMIT NO.

BENCHMARK

DESCRIPTION: COTTONWOOD GOLF COURSE
LOCATION: NAD 83, EPOCH 1998.50, ZONE 6, GEOID 3
RECORD FROM: ROS 16512
ELEVATION: 488.50 FEET DATUM: NGVD 29

PRIVATE CONTRACT

SHEET 11 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 11 SHEETS

EASEMENT PLAN FOR:

COTTONWOOD SAND MINING PROJECT

CALIFORNIA COORDINATE INDEX: 210-1791

Approved
COUNTY ENGINEER
BY:
Date

Engineer of work
WAYNE W. CHANG R.C.E. 46548

Grading Permit No.

FOR REVIEW ONLY

ENGINEER'S NAME: CHANG CONSULTANTS
PHONE NO. (858) 692-0760

FILE NO.

12/5/2021 10:42 PM

Attachment B.

Revegetation Plan

HELIX Environmental Planning

Cottonwood Sand Mine Project

Conceptual Revegetation Plan

PDS2018-MUP-18-023
PDS2018-RP-18-001
PDS2018-ER-18-19-007

May 2025 | 02975.00002.002

Prepared for:

County of San Diego
Planning & Development Services
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Project Proponent:

New West Investment Group, Inc.
565 N. Magnolia Avenue
El Cajon, CA 92020

Prepared by:

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942



Sally Trnka
County-approved Revegetation
Planning Consultant

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ACRONYMS AND ABBREVIATIONS

AMSL	above mean sea level
BOS	Biological Open Space
BTR	Biological Technical Report
Cal-IPC	California Invasive Plant Council
CDFW	California Department of Fish and Wildlife
CFG	California Fish and Game
County	County of San Diego
CWA	Clean Water Act
CWMW	California Wetlands Monitoring Workgroup
CY	cubic yards
DCSS	Diegan Coastal Sage Scrub
GPS	global positioning system
ft	feet
HELIX	HELIX Environmental Planning, Inc.
m	meter
MSCP	Multiple Species Conservation Program
MUP	Major Use Permit
NRCS	Natural Resources Conservation Service
PAMA	Pre-Approved Mitigation Area
POC	Point of Connection
Project	Cottonwood Sand Mine Project
RPO	Resource Protection Ordinance
RWQCB	Regional Water Quality Control Board
SDG&E	San Diego Gas & Electric
SDNWR	San Diego National Wildlife Refuge
SHBs	shot-hole borers
SMARA	Surface Mining and Reclamation Act
SR	State Route
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

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1.0 INTRODUCTION

This report presents a revegetation plan for impacts resulting from the Cottonwood Sand Mine Project (project) located in the unincorporated community of Rancho San Diego in eastern San Diego County, California. This plan addresses revegetation of areas temporarily impacted as part of mining activities pursuant to the Surface Mining and Reclamation Act (SMARA) and Sections 1810 and 6550-6556 of the County of San Diego (County) Zoning Ordinance, as well as restoration of wetland buffer areas disturbed as part of mining activities in accordance with Section 86.605(d) of the County's Resource Protection Ordinance (RPO) requirements (County 2011). Included in this document is an implementation, maintenance, and monitoring plan for the on-site revegetation of approximately 108.87 acres of wetland and riparian associated habitat, 11.92 acres of Diegan coastal sage scrub (DCSS) habitat, and 97.90 acres of stabilized non-sensitive uplands (i.e., erosion control areas). This report has been prepared in conformance with the County's Report Format and Content Requirements for Revegetation Plans (County 2007).

Revegetation is proposed to ensure that areas disturbed as part of mining activities are reclaimed (i.e., adequately revegetated and stabilized) in accordance with SMARA and County requirements, and that existing wetland buffer areas are appropriately restored pursuant to the County RPO (County 2011). A portion of the reclaimed site will also provide compensatory mitigation for impacts to wetland and water resources under the regulatory jurisdiction of the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act (CWA; 33 USC 1344), Regional Water Quality Control Board (RWQCB) pursuant to Section 401 of the CWA, and California Department of Fish and Wildlife (CDFW) pursuant to Sections 1600 et seq. of the California Fish and Game (CFG) Code, and to areas considered County RPO wetlands. Restoration of the mitigation area is addressed separately from this plan within the project's Conceptual Wetland Mitigation Plan (HELIX Environmental Planning, Inc. [HELIX] 2025a). The wetland mitigation area and native revegetation areas will be concurrently preserved within the project's biological open space area.

Nomenclature used in this report follows Holland (1986) and Oberbauer (2008) for vegetation; Jepson eFlora (2023) and Calflora (2023) for plants; Pelham (2022) and Davenport (2018) for butterflies; Society for the Study of Amphibians and Reptiles (2023) for reptiles and amphibians; American Ornithological Society (2022) for birds; and Bradley et al. (2014) and Tremor et al. (2017) for mammals.

2.0 PROJECT DESCRIPTION

2.1 RESPONSIBLE PARTIES

New West Investment, Inc. (or its successor in interest) will be responsible for financing the installation and maintenance and monitoring of the revegetation proposed in this plan. Contact information is provided below:

Contact: Jim Conrad, Owner's Representative
New West Investment, Inc.
565 N. Magnolia
El Cajon, CA 92020
619-441-1463

2.2 PROJECT LOCATION

The approximately 280-acre project site is located in the unincorporated community of Rancho San Diego in eastern San Diego County, California (Figure 1, *Regional Location*). It is depicted within unsectioned lands of Township 16 South, Ranges 1 West and 1 East of the Jamul Mountains and El Cajon, California U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle maps (Figure 2, *USGS Topograph*y). The site lies north of State Route (SR) 94 and east of SR 54 within the Cottonwood Golf Club. More specifically, the site occurs southeast of Willow Glen Drive, north of Jamul Drive, east of Jamacha Road, and west of Hillsdale Road at 3121 Willow Glen Drive, El Cajon, California (Figure 3, *Aerial Vicinity*). Steele Canyon Road bisects the project site from north to south, near the center of the site. The project site occurs within the following 24 Assessor Parcel Numbers: 506-021-19-00, 506 020-52, 518-012-13, 518-012-14, 518-030-05 through 518-030-08, 518-030-10, 518-030-12, 518 030-13, 518-030-15, 518-030-21, 518-030-22-00, 519-010-15, 519-010-17, 519-010-20, 519-010-21, 519-010-33, 519-010-34, 519-010-37, 519-011-03, 506-021-31, and 506-021-30.

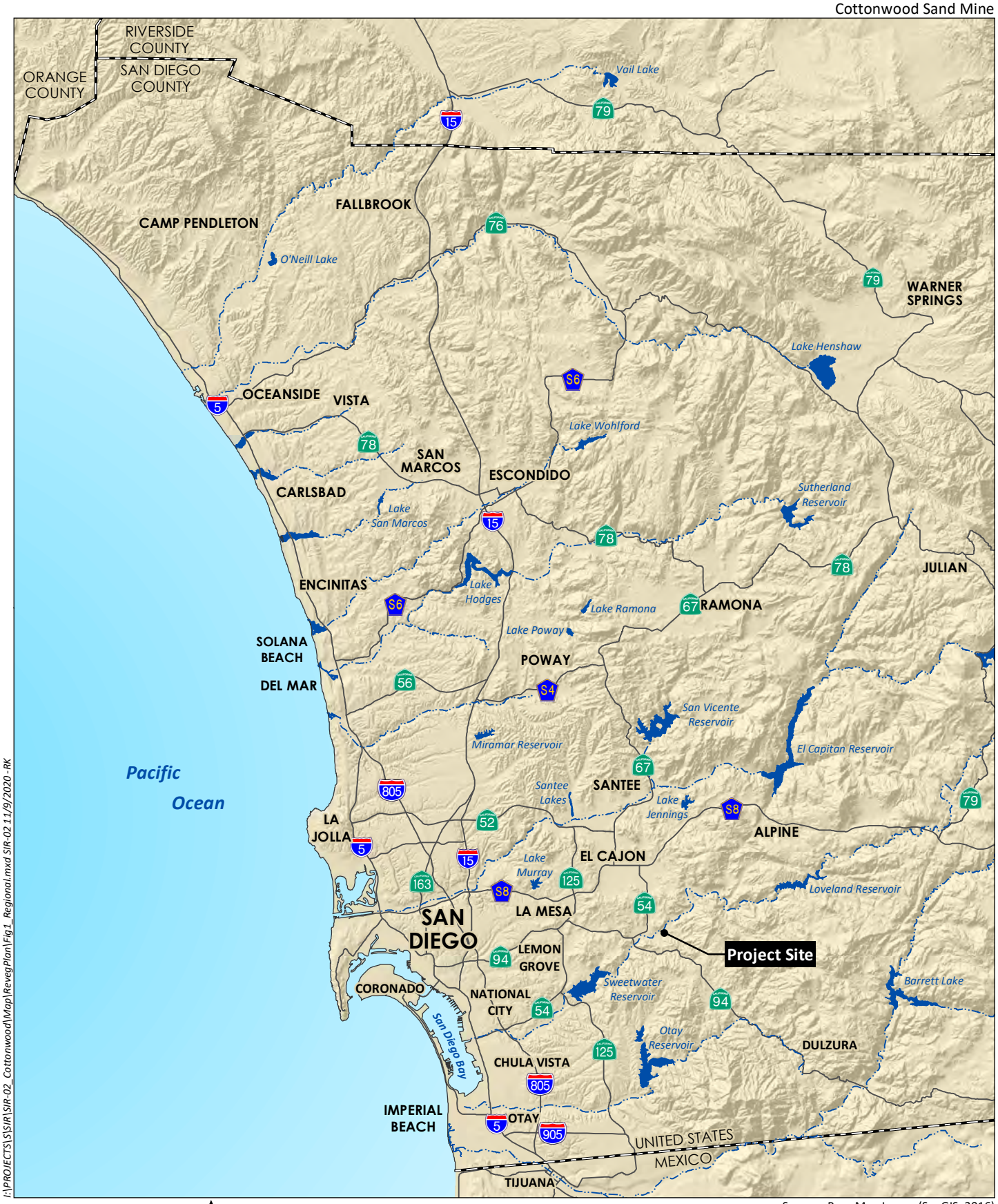
The site is located on unincorporated lands within the South County and Metro-Lakeside-Jamul segments of the County's Multiple Species Conservation Program (MSCP) Subarea Plan (Figure 4, *MSCP Designations*). Within the MSCP, portions of the site along the northeastern, southern, and southeastern boundaries occur within areas identified as Pre-Approved Mitigation Area (PAMA), and Minor Amendment lands occur in the southwestern portion of the site along the Sweetwater River (Figure 4).

2.3 PROJECT SUMMARY

2.3.1 Project Description

The project site is currently occupied by the Cottonwood Golf Club, which consists of two 18-hole golf courses, one east of Steele Canyon Road and the other located to the west. Currently, only the eastern course is operational; operation of the western course was suspended in 2017. The project proposes to convert the two golf courses into a sand mining operation that would be conducted in three phases over 10 years, with a fourth phase for cleanup, equipment removal, and final reclamation (Figure 5, *Site Plan and Mine Phasing*). The project's mining operations would extract, process, and transport sand using conventional earth-moving and processing equipment. Approximately 4.3 million cubic yards (CY; 6.40 million tons) of material are proposed to be extracted, with approximately 3.8 million CY (5.7 million tons) of sand and gravel for market use, with a 10 percent waste factor from the total amount extracted that includes wash fines and materials undesirable for processing (approximately 427,000 CY). These materials would be retained on-site and utilized for backfilling. In addition, approximately 2.5 million CY would be imported to the site to meet the backfill requirements. The imported material would consist of inert debris only. Inert debris would consist of excavated soil material from development projects, clean demolition materials, and possibly concrete, asphalt, and rock. The project would be conditioned to only accept materials suitable for the end use of the site.

Extraction operations would be limited to a maximum production of 380,000 CY (570,000 tons) of construction grade aggregate (sand) per calendar year. Material extracted and processed at the site would be suitable for construction uses and would be available to customers in San Diego County. Approximately 214.4 acres of the approximately 251.1-acre Major Use Permit (MUP) boundary are proposed for extractive use under a phased extraction program. Surface areas not disturbed by mining would either be left in their current condition or be subject to enhancement through the removal of



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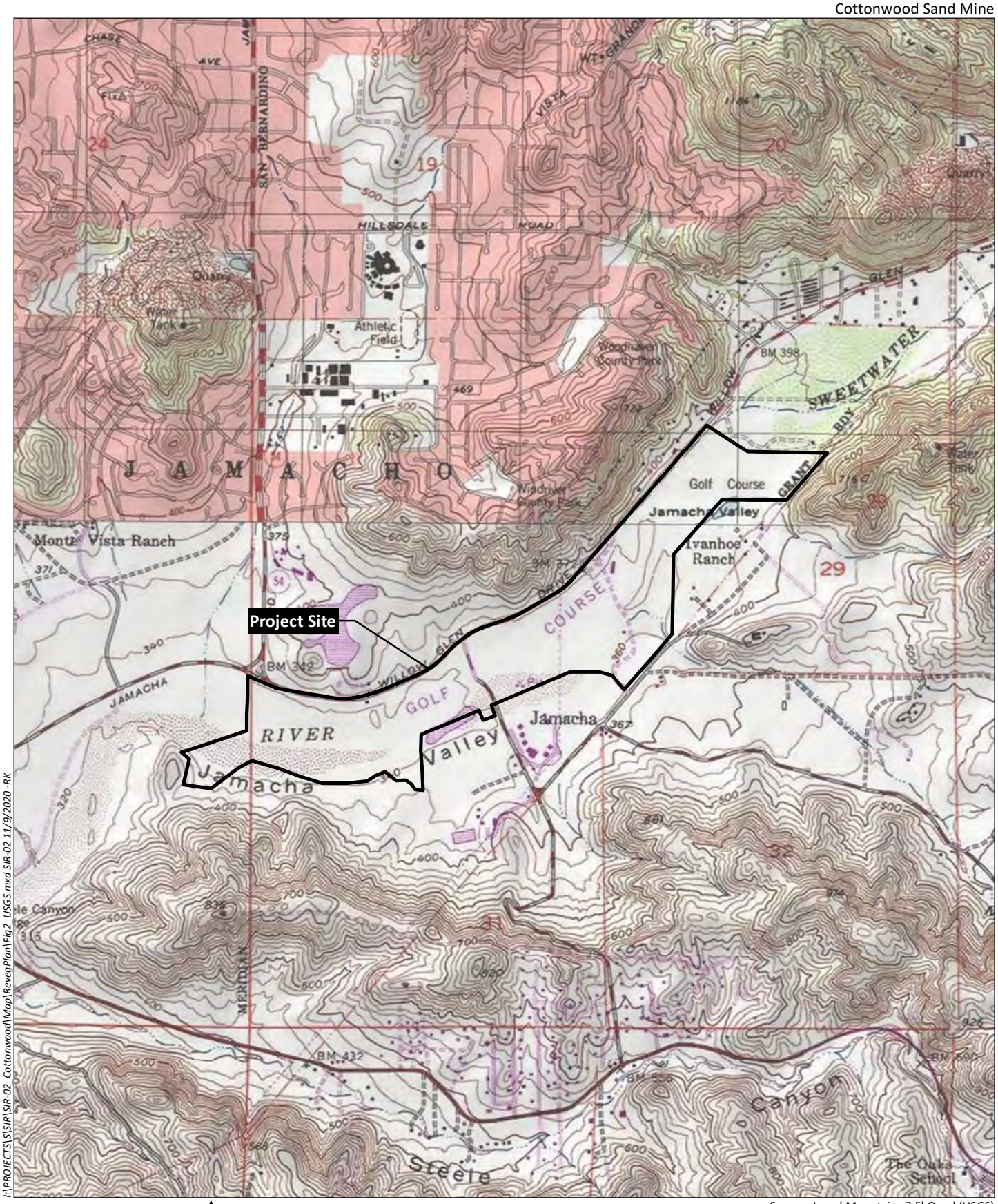
0 8 Miles

Source: Base Map Layers (SanGIS, 2016)

HELIX Environmental Planning

Regional Location

Figure 1



Source: Jamul Mountains 7.5' Quad (USGS)

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USGS Topography

Figure 2

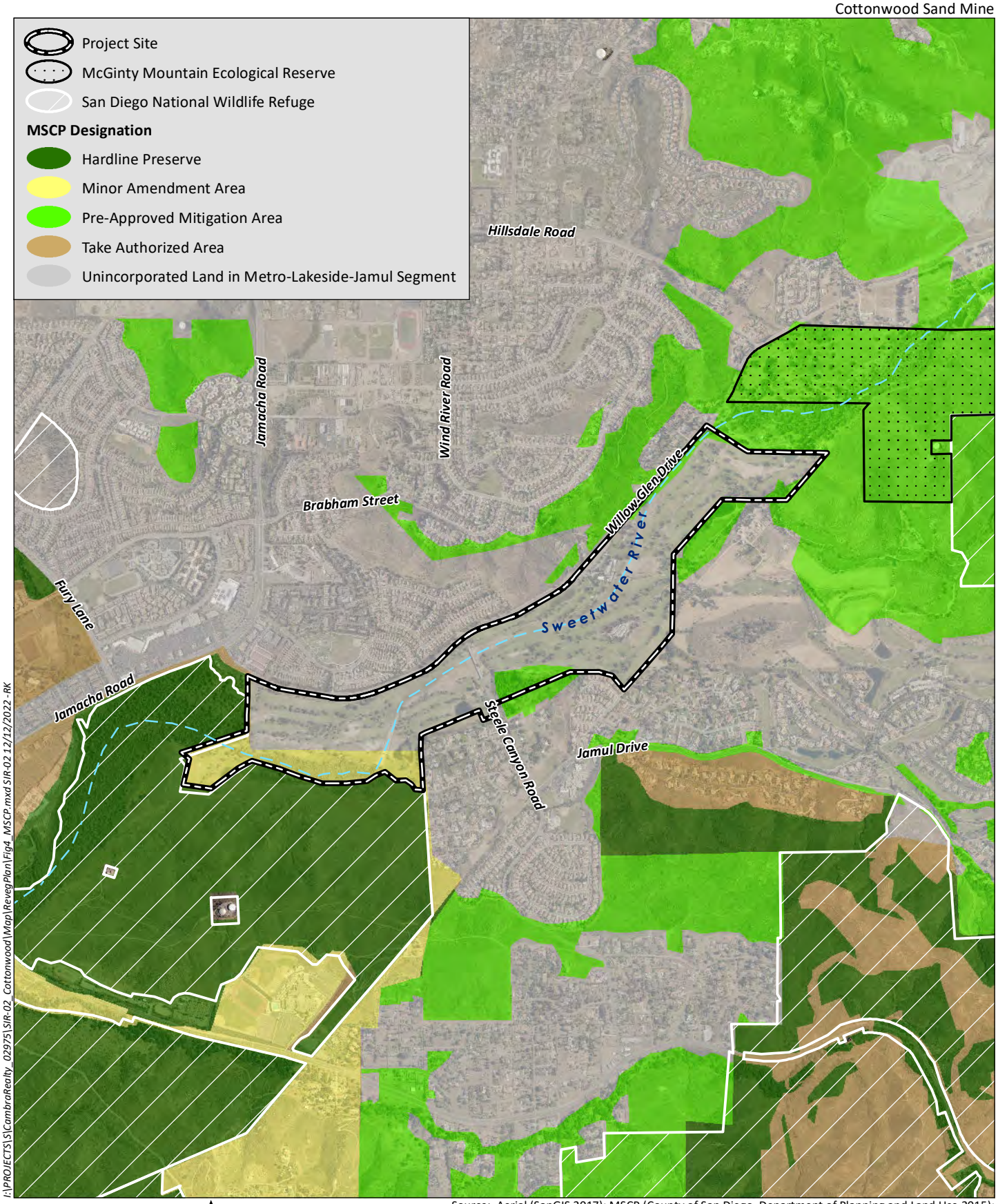


Source: Aerial (SanGIS 2019); NWR (U.S. Fish and Wildlife Service 2016)

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Aerial Vicinity

Figure 3



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Source: Aerial (SanGIS 2017); MSCP (County of San Diego, Department of Planning and Land Use 2015); NWR (U.S. Fish and Wildlife Service 2016); Ecological Reserves (CDFW 2013)

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MSCP Designations

Figure 4

Project Site
Major Use Permit Boundary
Phase 1
Phase 2
Phase 3
Phase 4/Proccessing Plant
Easements and Rights-of-way
San Diego Gas & Electric Towers

Jamacha Way
Private Road
Seca Street
Sonett Street
Wind River Road
Brabham Street
Hilton Head Road
Via Hacienda
Jamacha Road
Via Rancho San Diego
Willow Glen Drive
Processing Plant
Sweetwater River
Bridge
Right-of-way
Proposed Permanent
Site Access Point
SDG&E
Easement
Access Road
Cottonwood Springs Lane
Ivanhoe Ranch Road
Wentworth Drive
Heatherwood Drive
Steele Canyon Road
Par Four Drive
Jamul Drive
Greystone Drive

Nearmap, SANDAG, SanGIS

0 700 Feet

Source: Aerial (SanGIS 2019)

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HELIX
Environmental Planning

Site Plan and Mine Phasing

Figure 5

invasive species. The existing Sweetwater River channel and the majority of native habitat that currently exists on the site would be retained.

The project would be mined in three incremental, and partially overlapping phases, with three to four sub-phases in each major phase. Reclamation would begin after the first sub-phase of mining is complete and would be conducted on a continuous basis following the completion of each mining sub-phase. Pre-mining activities proposed prior to the initiation of Phase 1 include the restriping of Willow Glen Drive from Steele Canyon Road to the northeastern property boundary to provide Class II buffered bike lanes on both sides of the roadway, improvements to the access point from Willow Glen Drive to the Phase 1 excavation area, and installation of screening landscaping and a pedestrian pathway. To facilitate the deceleration of right-turning vehicles into the project ingress driveway, a dedicated right-turn lane would be constructed, which would serve as the primary access for mining operations, material sales, employees, and vendors. Additionally, a pedestrian pathway would be provided along the northern project frontage/Willow Glen Drive east of Steele Canyon Road to provide pedestrian access within the project vicinity where there are no existing sidewalks. Phase 1 would begin with the placement of the processing plant and the conveyor line from the plant to the western portion of the property, where excavation would begin. Processing facilities would be located near the center of the project area, adjacent to Willow Glen Drive and west of the existing golf course parking lot. The plant site would consist of the aggregate processing and washing facilities, three settling ponds, a loadout area, and support structures and buildings (e.g., scale, kiosk, and office trailer). A portable conveyor line would be installed to minimize the use of on-site roads to transport excavated materials from the excavation area to the processing plant.

Mining operations would commence in the western portion of the site as part of Phase 1 and proceed east as subsequent phases are initiated: Phase 1 would be located within the area currently occupied by the closed Lakes Course to the west of Steele Canyon Road; Phase 2 would be located in the center of the site, east of Steele Canyon Road, on the currently operating Ivanhoe Course; Phase 3 would be located to the east of Phase 2. Existing vegetation and infrastructure within the golf courses would be incrementally removed as mining operations proceed, with approximately 20 to 30 acres subject to mining at any one time. Each phase would include three to four sub-phases that are less than 30 acres each and would begin reclamation as soon as possible following the completion of extraction activities. Excavation in each sub-phase would be completed before moving the conveyor and excavation equipment to the next sub-phase, and reclamation would begin in the completed sub-phase. Upon approval of the project, the Ivanhoe Course would be closed. The existing golf clubhouse would be demolished near the end of Phase 2 mining. As each phase of mining is completed, final contours would be established via grading and backfilling, all final clean-up would be conducted and equipment removed, and the mined area would be reclaimed and revegetated. Following the completion of Phase 3 mining, the processing plant would be removed as part of a final Phase 4 consisting of final clean-up and equipment removal from the project site.

Prior to initiating work in a sub-phase, existing vegetation will be cleared, and topsoil will be salvaged. The existing banks of the low-flow Sweetwater River channel will remain undisturbed up to a minimum height of 3.5 feet to accommodate existing transfer flow rates. To maintain living soil microorganisms, topsoil will be stored on-site in windrows not more than three feet tall, in an area cleared of existing vegetation. The maximum excavation depth is proposed to be 40 feet below the existing land surface, with the average depth of excavation outside the main Sweetwater River channel expected to be approximately 20 feet below the existing land surface. Excavation would not occur within the bottom of the existing low-flow river channel to retain existing hydrologic characteristics. Up to three temporary

channel crossings would be utilized to transport heavy equipment across the low-flow river channel during mining operations. Channel crossings would only be used when there is no water flow in the channel. An operating procedure would be established to maintain communication with the Sweetwater Authority prior to, and during, water transfers to ensure channel crossings during water flows are avoided. As soon as excavation within a sub-phase is completed, the conveyor and excavation equipment would be moved to the next sub-phase, and reclamation of the completed sub-phase would begin.

The project proposes to restripe Willow Glen Drive between Steele Canyon Road and the project ingress driveway to provide Class II buffered bike lanes on both sides of the roadway per the County Roadway Standards and the General Plan Mobility Element roadway classification. To facilitate the deceleration of right-turning vehicles into the Project ingress driveway, a dedicated right-turn lane would also be constructed, which would serve as the primary access for mining operations, material sales, employees, and vendors. A new egress point would be established in the approximate center of the existing parking lot. The project also proposes to construct an acceleration lane between the ingress and egress driveways, which would serve as a refuge lane for trucks to complete their outbound maneuver. A pedestrian pathway would be provided along the northern project frontage/Willow Glen Drive east of Steele Canyon Road to provide pedestrian access within the project vicinity where there are no existing sidewalks. In addition, a new access point to the property from Willow Glen Drive west of Steele Canyon Road (Phase 1 area) would be necessary as the clearance height of the bridge that crosses the Sweetwater River on Steele Canyon Road would not allow most large trucks used by service vendors to pass beneath the bridge. Additional access points are proposed to be constructed at the intersection of Willow Glen Drive and Muirfield Drive. The new driveway would be restricted to servicing the mining operations.

The site would be progressively reclaimed following the completion of extraction activities within each subphase area in accordance with the mining and reclamation plan (EnviroMINE 2021). Reclamation would include: (1) removal of all artificial structures (with the exception of permanent erosion control features); (2) grading and backfilling to achieve final landforms; (3) incorporation of accumulated wash fines, imported material, and salvaged topsoil (as applicable); and (4) revegetation and monitoring. Final grading would begin after mining and backfilling have been completed within a given area, and as extractive operations proceed to the east. Reclamation would be an ongoing process that commences where mining operations have ceased within a given sub-phase area and continues until all mining-related disturbance is reclaimed.

Post-reclamation, the final landform of the overall mining area is proposed to be a relatively flat plain that gently slopes downward from east to west, with an expanded floodplain bisecting the length of the site. The expanded floodplain is expected to range in width from approximately 400 to 700 feet and would be slightly higher in elevation than the existing low-flow river channel. The existing low-flow river channel would be retained in place with banks up to a minimum height of 3.5 feet to accommodate annual water transfers from Loveland Reservoir to Sweetwater Reservoir that are controlled by the Sweetwater Authority. The low-flow river channel banks would slope down to the expanded floodplain, which will be at a similar elevation to the existing low-flow river channel or slightly higher. In some areas, benches may be constructed at the edges of the floodplain to accommodate varying vegetation types and/or multi-use trails. Slopes bordering the expanded floodplain would slope up to the plain surface at a 3:1 ratio or shallower, with an elevation difference of up to 25 feet between the top of slope and bottom of the low-flow river channel. Reclaimed and revegetated areas would be restored to an end-use of open space, multi-use trails, and land suitable for uses allowed by the General Plan land use

designation and existing zoning classifications. Maintenance and monitoring of the restored and revegetated native habitat areas would continue until final performance standards are met in all revegetation areas. Following revegetation completion, nearly 54 percent of the project site (149.0 acres) would be preserved in a biological open space (BOS) easement, which would protect these lands in perpetuity, and would restrict future uses to protect their biological value.

2.3.2 Current Environmental Setting and Site Conditions

The project site is generally located within the Sweetwater River Valley ecoregion of southeast San Diego County. It occurs within the boundaries of the Rancho San Diego Specific Plan Area of the Valle de Oro Community Planning Area. Generalized climate in the region is regarded as dry, sub-humid mesothermal, with warm dry summers and cold moist winters. Mean annual precipitation is between 14 and 18 inches, and the mean annual temperature is between 60- and 62-degrees Fahrenheit. The frost-free season is 260 to 300 days.

The project site has been subjected to past human disturbances and habitat modification associated with the development of the golf course and intermittent mining. Prior to the 1940s, the site was used for commercial ranching and agriculture, most of which had ended by the 1950s. A 1953 aerial photograph of the site indicates that the floodplain of the Sweetwater River was primarily undeveloped, with the presence of a small, wooden house/structure adjacent to Willow Glen Drive to the west of Steele Canyon Road. Since the 1960s, the project site has operated as a public golf course with intermittent mining. Construction of the golf course initially began in 1962 and was completed in 1964. Mining activities within the site began in the early 1950s to the south of the Sweetwater River and continued through the 1970s, allowing for the creation of water hazards and expanded fairways associated with golf course construction and improvements. The site currently operates as a public golf course, though golf play and irrigation of landscaped turf in the western portion of the site was discontinued in 2017.

Vegetation within the project site reflects the site's disturbed and developed nature. Approximately 244.8 acres (88 percent) of the site is currently occupied by a public golf course, or is otherwise disturbed by past land uses, including 1.7 acres of non-native woodland, 2.6 acres of eucalyptus woodland, 7.5 acres of non-native vegetation, 3.0 acres of artificial pond, and 230.0 acres of disturbed habitat and developed lands containing a combination of active and inactive golf course areas, in addition to a clubhouse, parking lot, maintenance facilities and other buildings, golf cart paths, and other areas of hardscape or maintained landscaping. Undeveloped areas are concentrated along the western and eastern edges of the site and consist primarily of native upland scrub and riparian forest communities. The dominant native habitat type present on-site is southern cottonwood-willow riparian forest, which covers approximately 12.87 acres (five percent) of the site. The Sweetwater River and associated floodplain have been severely modified as a result of previous golf course development. The river has been channelized through the site and its width has been constricted to allow for the development of golf course fairways. Additionally, the hydrological regime of the Sweetwater River has been heavily altered from the creation of several artificial impoundments upstream and downstream of the project site, such as the Loveland Reservoir and Sweetwater Reservoir, which are subject to water transfers and controlled releases by the Sweetwater Authority.

The project site occurs within both the northeastern portion of the South County Segment and the southwestern portion of the Metro-Lakeside-Jamul Segment of the adopted County MSCP Subarea Plan (County 1997). Three small areas of PAMA, totaling 16.40 acres (six percent), occur along the

northeastern, southeastern, and southern project boundaries (Figure 4). Additionally, approximately 37.79 acres (14 percent) of the site at the southwestern boundary represent a Minor Amendment Area.

Land uses in the surrounding area include residential and rural residential developments to the north and south, extractive operations to the east, and an adjacent golf course to the southeast. Open space is present in the hills south, east, and west of the site. The San Diego National Wildlife Refuge (SDNWR) abuts the western project boundary along the Sweetwater River.

2.3.3 Topography and Soils

Elevations on-site generally decrease from east to west across the site, with the lowest elevations (approximately 320 feet (ft) above mean sea level [AMSL]) occurring along the southwestern boundary, and the highest elevations (approximately 380 ft AMSL) along the northeastern boundary. The Sweetwater River runs through the length of the site entering at the northeastern project boundary and continuing in a mostly east-west direction to the southern boundary, where it exits the site and continues southwest towards Sweetwater Reservoir. The Sweetwater River extends from its headwaters in the Cuyamaca Mountains (east of the site) to the Pacific Ocean, approximately 15 miles downstream of the site.

Six soil series, which comprise nine soil types, have been mapped on-site (Natural Resources Conservation Service [NRCS] 2022; Figure 6, *Soils*), with the majority classified as sandy loams. Soil types covering the most area on-site include Riverwash and those in the Tujunga series. The soil and geologic study conducted for the project by Geocon also found that the site was predominately comprised of alluvial channel and alluvial flood plain deposits (Geocon 2020).

2.3.4 Vegetation Communities

Fifteen vegetation communities/land use types occur on the project site (Table 1, *Existing Vegetation Communities/Land Use Types*; Figure 7, *Vegetation and Sensitive Resources/Impacts*). The numeric codes in parentheses following each community/land use type name are from the Holland classification system (Holland 1986) and as added to by Oberbauer (2008) as presented in the County's Biology Guidelines (County 2010).

Table 1
EXISTING VEGETATION COMMUNITIES/LAND USE TYPES

Vegetation Community[1]	Acres[2]		
	Within MUP	Outside MUP	Total
Tier I[3]			
Disturbed Wetland (11200)	10.25	0	10.25
Freshwater Marsh (52400)	0.22	0	0.22
Southern Cottonwood-willow Riparian Forest (61330)	9.43	2.42	11.85
Southern Cottonwood-willow Riparian Forest - disturbed (61330)	0.87	0.15	1.02
Southern Willow Scrub - disturbed (63320)	4.82	0	4.82
Tamarisk Scrub (63810)	1.20	0.03	1.23
Open Water (64140)[4]	1.68	0	1.68
Arundo-dominated Riparian (65100)	0.48	0.08	0.56

Vegetation Community[1]	Acres[2]		
	Within MUP	Outside MUP	Total
Tier II			
Diegan Coastal Sage Scrub (32500)	0.8	0.5	1.3
Diegan Coastal Sage Scrub – disturbed (32500)	0.5	<0.1	0.5
Tier IIIB			
Non-native Grassland (42200)	0	0.2	0.2
Tier IV			
Non-native Woodland (79000)	1.5	0.2	1.7
Eucalyptus Woodland (79100)	2.1	0.5	2.6
Non-native Vegetation (11000)	6.6	0.9	7.5
Disturbed Habitat (11300)	79.0	12.3	93.1
N/A			
Artificial Pond (64140)[4]	3.0	0	3.0
Developed Land (12000)	122.0	14.9	136.9
TOTAL	**244.45**	**32.18**	**276.63**

[1] Vegetation categories and numerical codes are from Holland (1986) and Oberbauer (2008).
[2] Upland habitats are rounded to the nearest 0.1 acre, while wetland habitats are rounded to the nearest 0.01; thus, totals reflect rounding.
[3] County Subarea Habitats and Tiers within the MSCP.
[4] The numerical Holland/Oberbauer code refers to Fresh Water which describes year-round bodies of fresh water in the form of lakes, streams, ponds, or rivers and is the most appropriate vegetation community that represents these areas.

Sensitive vegetation communities/habitat types mapped on the project site include disturbed wetland, freshwater marsh, southern cottonwood-willow riparian forest (including disturbed), disturbed southern willow scrub, tamarisk scrub, open water, arundo-dominated riparian, DCSS (including disturbed), and non-native grassland. Non-native woodland, eucalyptus woodland, non-native vegetation, disturbed habitat, artificial pond, and developed lands do not meet the definition of sensitive habitat under the County's Biology Guidelines (County 2010).

2.3.5 Flora

A total of 190 plant species were identified within the project site, of which 80 (42 percent) are native species, and 110 (28 percent) are non-native species (HELIX 2025b).

2.3.6 Wildlife

A total of 129 animal species were observed or otherwise detected on the project site during recent biological surveys, including 14 invertebrate, one fish, four amphibian, six reptile, 85 bird, and 19 mammal species (HELIX 2025b).

2.3.7 Special-Status Species

No federal- or state-listed plant species were observed within the project site during recent surveys (HELIX 2025b); however, four species with other special status were observed: San Diego sagewort (*Artemisia palmeri*), San Diego County viguiera (*Bahiopsis laciniata*), Palmer's goldenbush (*Ericameria palmeri* var. *palmeri*), and southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*). Additionally, although not found on-site, U.S. Fish and Wildlife Service (USFWS) critical habitat for the federally endangered

San Diego ambrosia (*Ambrosia pumila*) is present in the southwestern portion of the site (Figure 8, *Critical Habitat*).

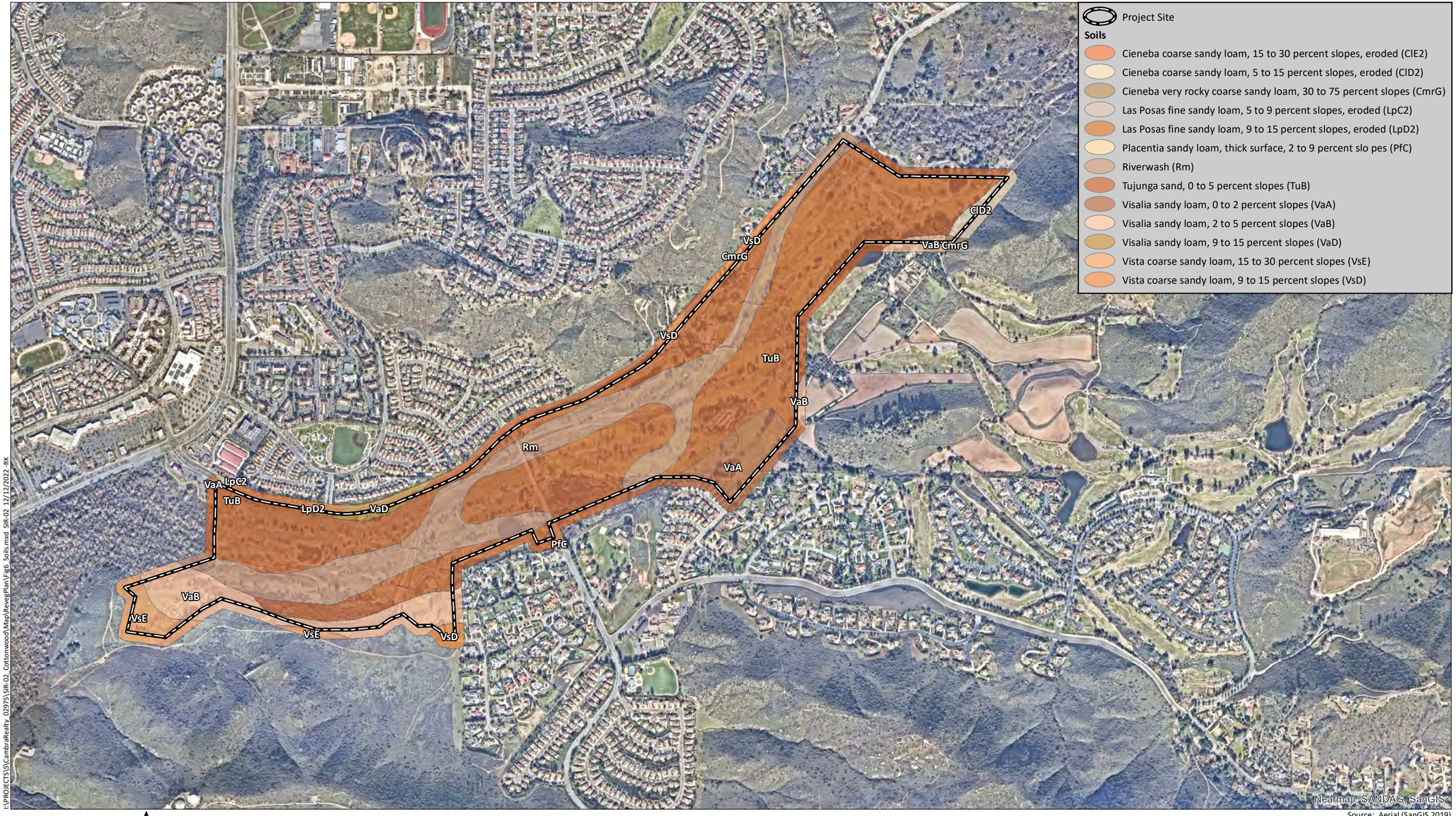
Two federal- and/or state-listed wildlife species were observed within the project site during recent surveys (HELIX 2025b): coastal California gnatcatcher (*Polioptila californica californica*) and least Bell's vireo (*Vireo bellii pusillus*). An additional 21 other special-status animal species were observed or detected on or directly adjacent to the project site or observed flying over the project site: barn owl (*Tyto alba*), Belding's orange-throated whiptail (*Aspidoscelis hyperythra beldingi*), Cooper's hawk (*Accipiter cooperii*), great blue heron (*Ardea herodias*), green heron (*Butorides virescens*), Lawrence's goldfinch (*Spinus lawrencei*), Monarch butterfly (*Danaus plexippus*), oak titmouse (*Baeolophus inornatus*), peregrine falcon (*Falco peregrinus*), red-shouldered hawk (*Buteo lineatus*), small-footed myotis (*Myotis ciliolabrum*), Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), turkey vulture (*Cathartes aura*), vermilion flycatcher (*Pyrocephalus rubinus*), western bluebird (*Sialia mexicana*), western mastiff bat (*Eumops perotis*), western red bat (*Lasiurus blossevillii*), white-tailed kite (*Elanus leucurus*), yellow-breasted chat (*Icteria virens*), yellow warbler (*Setophaga petechia*), and Yuma myotis (*Myotis yumanensis*). Additionally, USFWS critical habitat for the coastal California gnatcatcher and least Bell's vireo occurs in the southwestern portion of the site, and critical habitat for the southwestern willow flycatcher (*Empidonax traillii extimus*) is present immediately adjacent to the site (Figure 8).

2.3.8 Project Impacts

2.3.8.1 Sensitive Vegetation

The project would permanently impact 2.34 acres of sensitive vegetation communities, including 1.2 acres of uplands and 1.14 acres of wetlands. Impacts to 1.2 acres of sensitive upland vegetation communities consist entirely of DCSS (Table 2, *Project Impacts to Vegetation Communities/Habitat Types*; Figure 7; HELIX 2025b). Impacts to wetlands include including 0.55 acre of disturbed wetland, 0.44 acre of southern cottonwood-willow riparian forest (including disturbed), 0.13 acre of disturbed southern willow scrub, 0.01 acre of tamarisk scrub, and 0.01 acre of arundo-dominated riparian (Table 2; Figure 7).

Cottonwood Sand Mine



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0 1,000 Feet

Source: Aerial (SanGIS 2019)

HELIX Environmental Planning

Soils

Figure 6

- Project Site
- Major Use Permit Boundary
- Phase 1
- Phase 2
- Phase 3
- Phase 4/Proccessing Plant
- Impact Area
- Impact Neutral Area
- Roadway Improvement Impacts
- Trail Impacts
- Conceptual Multi-Use Trails (Post-Reclamation)
- Proposed Pathway

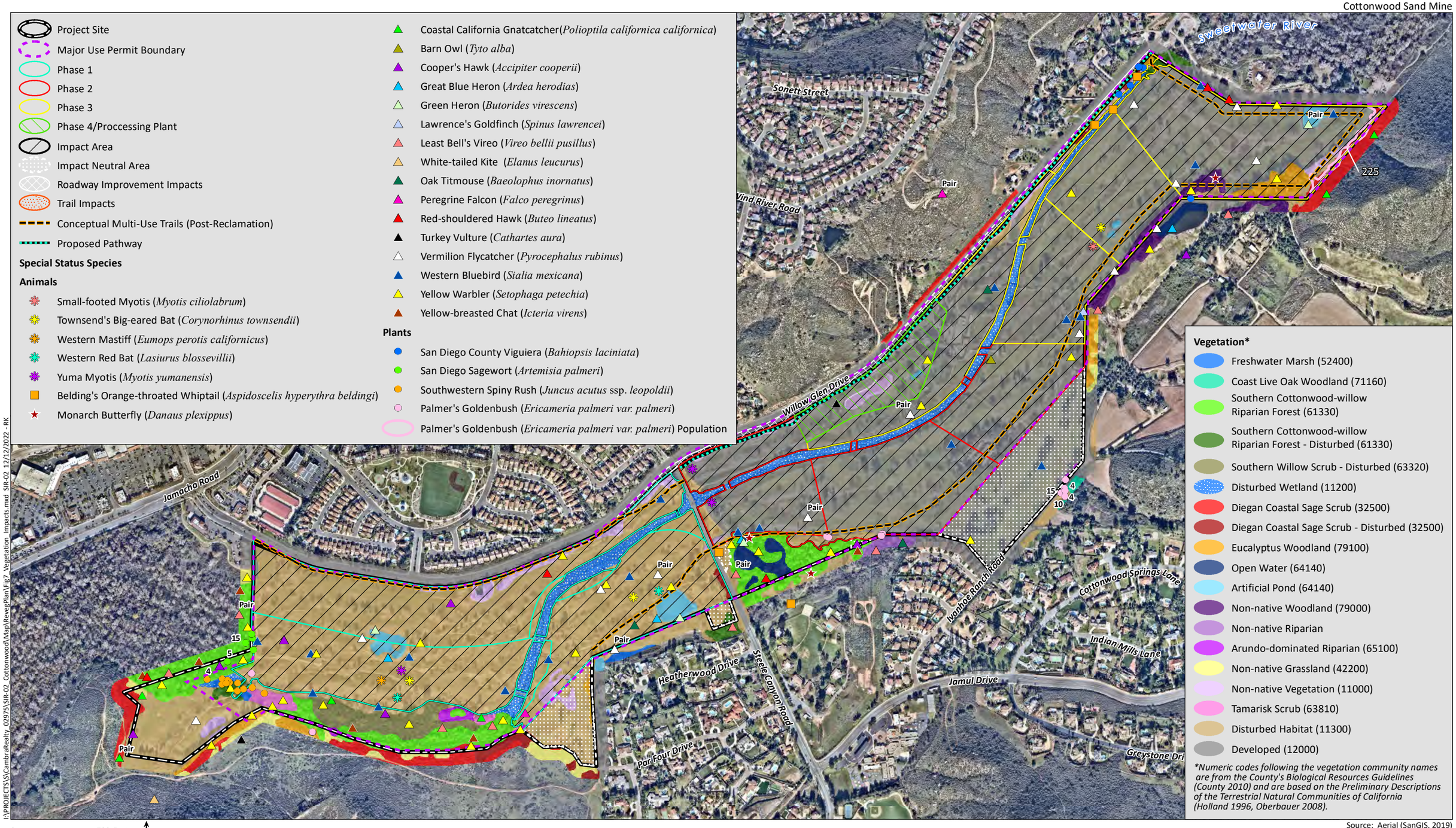
Special Status Species

Animals

- Small-footed Myotis (*Myotis ciliolabrum*)
- Townsend's Big-eared Bat (*Corynorhinus townsendii*)
- Western Mastiff (*Eumops perotis californicus*)
- Western Red Bat (*Lasiurus blossevillii*)
- Yuma Myotis (*Myotis yumanensis*)
- Belding's Orange-throated Whiptail (*Aspidoscelis hyperythra beldingi*)
- Monarch Butterfly (*Danaus plexippus*)
- Coastal California Gnatcatcher(*Polioptila californica californica*)
- Barn Owl (*Tyto alba*)
- Cooper's Hawk (*Accipiter cooperii*)
- Great Blue Heron (*Ardea herodias*)
- Green Heron (*Butorides virescens*)
- Lawrence's Goldfinch (*Spinus lawrencei*)
- Least Bell's Vireo (*Vireo bellii pusillus*)
- White-tailed Kite (*Elanus leucurus*)
- Oak Titmouse (*Baeolophus inornatus*)
- Peregrine Falcon (*Falco peregrinus*)
- Red-shouldered Hawk (*Buteo lineatus*)
- Turkey Vulture (*Cathartes aura*)
- Vermilion Flycatcher (*Pyrocephalus rubinus*)
- Western Bluebird (*Sialia mexicana*)
- Yellow Warbler (*Setophaga petechia*)
- Yellow-breasted Chat (*Icteria virens*)

Plants

- San Diego County Viguiera (*Bahiopsis laciniata*)
- San Diego Sagewort (*Artemisia palmeri*)
- Southwestern Spiny Rush (*Juncus acutus* ssp. *leopoldii*)
- Palmer's Goldenbush (*Ericameria palmeri var. palmeri*)
- Palmer's Goldenbush (*Ericameria palmeri var. palmeri*) Population



Vegetation*

- Freshwater Marsh (52400)
- Coast Live Oak Woodland (71160)
- Southern Cottonwood-willow Riparian Forest (61330)
- Southern Cottonwood-willow Riparian Forest - Disturbed (61330)
- Southern Willow Scrub - Disturbed (63320)
- Disturbed Wetland (11200)
- Diegan Coastal Sage Scrub (32500)
- Diegan Coastal Sage Scrub - Disturbed (32500)
- Eucalyptus Woodland (79100)
- Open Water (64140)
- Artificial Pond (64140)
- Non-native Woodland (79000)
- Non-native Riparian
- Arundo-dominated Riparian (65100)
- Non-native Grassland (42200)
- Non-native Vegetation (11000)
- Tamarisk Scrub (63810)
- Disturbed Habitat (11300)
- Developed (12000)

**Numeric codes following the vegetation community names are from the County's Biological Resources Guidelines (County 2010) and are based on the Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1996, Oberbauer 2008).*

0 700 Feet

Source: Aerial (SanGIS, 2019)

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Vegetation and Sensitive Resources/Impacts

Figure 7

Cottonwood Sand Mine

Project Site

Critical Habitat

- Coastal California gnatcatcher
- Least Bell's vireo
- San Diego ambrosia
- Southwestern willow flycatcher

Sweetwater River

Nearmap, SANDAG, SanGIS

0 1,000 Feet

Source: Aerial (SanGIS 2019)

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HELIX Environmental Planning

Critical Habitat

Figure 8

Table 2
PROJECT IMPACTS TO VEGETATION COMMUNITIES/HABITAT TYPES

Vegetation Community	Impact Neutral Areas (Acres)[1]	Project Impacts (Acres)[1]					Road Improvement Impacts (Acres)[1]	Total Impacts (Acres)[1]		
		Phase 1	Phase 2	Phase 3	Phase 4	Total On-Site		On-Site	Off-Site	Total
Sensitive Vegetation Communities										
Tier I[2]										
Disturbed Wetland	0	0.16	0.26	0.13	0	0.55	0	0.55	0	0.55
Freshwater Marsh	0	0	0	0	0	0	0	0	0	0
Southern Cottonwood-willow Riparian Forest – including disturbed	0.30	0.27	0.12	0.05	0	0.44	0	0.44	0	0.44
Southern Willow Scrub – including disturbed	0	0.13	0	0	0	0.13	0	0.13	0	0.13
Tamarisk Scrub	0.02	0.01	0	0	0	0.01	0	0.01	0	0.01
Open Water	0	0	0	0	0	0	0	0	0	0
Arundo-dominated Riparian	0.07	0.01	0	0	0	0.01	0	0.01	0	0.01
Tier II										
Diegan Coastal Sage Scrub	0.1	0.2	0	0.9	0	1.1	0.1	1.1	0.1	1.2
Tier IIIB										
Non-native Grassland	<0.1	0	0	0	0	0	0	0	0	0
Subtotal Sensitive Communities	*0.49*	*0.63*	*0.26*	*0.49*	*0.06*	*1.43*	*0.1*	*2.24*	*0.10*	*2.34*
Non-Sensitive Vegetation Communities										
Tier IV										
Non-native Woodland	0	0	0	1.7	0	1.7	0	1.7	0	1.7
Eucalyptus Woodland	0.4	<0.1	0	2.1	0	2.1	<0.1	2.1	<0.1	2.1
Non-native Vegetation	0.4	3.2	0.6	1.5	1.2	6.5	2.0	6.5	2.0	8.5
Disturbed Habitat	5.6	71.8	1.8	2.4	0	76.0	0.1	76.0	0.1	76.1
N/A										
Artificial Pond	0	2.2	0	0.4	0.1	2.7	0	2.7	0	2.7
Developed Land	14.8	0.5	47.3	64.8	7.9	120.5	2.8	120.7	2.6	123.3
Subtotal Non-Sensitive Communities	*21.2*	*77.7*	*49.7*	*72.9*	*9.2*	*209.5*	*4.9*	*209.7*	*4.7*	*214.4*
TOTAL	**21.69**	**78.48**	**50.08**	**73.98**	**9.20**	**211.74**	**5.0**	**211.94**	**4.8**	**216.74**

[1] Upland habitats are rounded to the nearest 0.1 acre, while wetland habitats are rounded to the nearest 0.01; thus, totals reflect rounding.

[2] County Subarea Habitats and Tiers within the MSCP.

2.3.8.2 Special-Status Plants

The project would result in impacts to four special-status plant species: Palmer's goldenbush, San Diego sagewort, southwestern spiny rush, and San Diego County viguiera. Palmer's goldenbush is a CRPR 1B.1 species, County List B, MSCP covered, and MSCP narrow endemic species. Approximately 234 individuals would be impacted by the proposed project. Southwestern spiny rush is a CRPR 4.2 species and County List D species. Three individuals occurring within the southwestern portion of the project along the Sweetwater River would be impacted by the removal of an existing bridge crossing. San Diego viguiera is a CRPR 4.3 and County List D species. Five San Diego County viguiera shrubs would be impacted by the proposed project along the site's northeastern boundary, including three shrubs located within the project site and two shrubs located outside of the project site within the road widening impact area. San Diego sagewort is a CRPR 4.2 and County List D species. Two San Diego sagewort individuals observed at the western project boundary at the edge of southern riparian forest habitat would be impacted by the proposed project.

Impacts to San Diego sagewort, southwestern spiny rush, and San Diego County viguiera are considered significant and would be mitigated through on-site habitat re-establishment, rehabilitation, revegetation, and preservation. Impacts to Palmer's goldenbush are considered significant. As a County List B plant species, species-based mitigation is required at a minimum 1:1 ratio pursuant to County Requirements (2010a). Impacts to Palmer's goldenbush would be mitigated through planting and seeding of the species within on-site native revegetation area in accordance with this plan.

2.3.8.3 Special-Status Wildlife

The project would result in impacts to suitable breeding or foraging habitat for 23 special-status animal species observed or detected on or adjacent to the site, including coastal California gnatcatcher, least Bell's vireo, Cooper's hawk, oak titmouse, red-shouldered hawk, turkey vulture, peregrine falcon, white-tailed kite, yellow-breasted chat, vermilion flycatcher, Lawrence's goldfinch, monarch butterfly, Belding's orange-throated whiptail, great blue heron, green heron, yellow warbler, western bluebird, barn owl, small-footed myotis, Townsend's big-eared bat, western mastiff bat, western red bat, and Yuma myotis. The project would result in impacts to 1.2 acres of disturbed Diegan coastal sage scrub, which provides potential habitat for the coastal California gnatcatcher. Impacts to potential gnatcatcher habitat would be significant. The project site provides suitable breeding habitat for least Bell's vireo and multiple individuals were detected within, and adjacent to, the project site during protocol surveys conducted in 2019 (HELIX 2025b). The project would impact 0.44 acre of southern cottonwood-willow riparian forest (including disturbed), 0.13 acre of disturbed southern willow scrub, and 0.01 tamarisk scrub at the edge of existing habitat located along the Sweetwater River, including areas where vireos have been detected. Impacts to suitable vireo breeding habitat would be significant.

Project impacts to potential breeding and foraging habitat for coastal California gnatcatcher, least Bell's vireo, and other special-status wildlife would be mitigated through on-site habitat re-establishment, rehabilitation, revegetation, and preservation, combined with other project-specific mitigation measures to address potential impacts, such as restrictions on clearing and grubbing during the avian breeding season. Mitigation for impacts to wetland and riparian habitats are addressed separately from this plan in the Conceptual Wetland Mitigation Plan (HELIX 2025a).

2.3.9 Required Compensatory Mitigation

A summary of project impacts to biological resources and required mitigation is provided in the Biological Technical Report (BTR; HELIX 2025b). The project would result in impacts to a total of 2.34 acres of riparian habitat or other sensitive natural communities (Table 2; Figure 9, *Conceptual Reclamation Revegetation and Compensatory Mitigation Areas*), including 0.55 acre of disturbed wetland, 0.44 acre of southern cottonwood-willow riparian forest (including disturbed), 0.13 acre of southern willow scrub, 0.01 acre of tamarisk scrub, 0.01 acre of arundo-dominated riparian, and 1.2 acres of Diegan coastal sage scrub (including disturbed). This plan addresses mitigation for impacts to sensitive upland vegetation communities (i.e., DCSS), special-status plant species, potential breeding and foraging habitat for special-status animal species, and revegetation of areas temporarily disturbed as part of mining activities. Mitigation for impacts to sensitive wetland and riparian habitats are addressed in the Conceptual Wetland Mitigation Plan (HELIX 2025a). As required by the County's Report Format and Content Requirements for Revegetation Plans (County 2007), relevant sections of the BTR (i.e., mitigation requirements and habitat being impacted) will be included as an appendix to the Final Revegetation Plan.

BIO-1 Mitigation for impacts to 1.2 acres of potential foraging habitat for coastal California gnatcatcher, comprised solely of Diegan coastal sage scrub, shall occur at a 1.5:1 ratio for a total mitigation requirement of 1.8 acres. Mitigation shall occur through the on-site preservation of 0.6 acre of Diegan coastal sage scrub and on-site revegetation of 11.3 acres of Diegan coastal sage scrub for a total of 11.9 acres of Diegan coastal sage scrub to be preserved within the biological open space easement.

BIO-3 Mitigation for impacts to 0.58 acre of potential nesting and foraging habitat for least Bell's vireo (southern cottonwood-willow riparian forest, disturbed southern willow scrub, and tamarisk scrub) shall occur at a minimum 3:1 ratio with at least 1:1 creation (establishment/re-establishment) for a total mitigation requirement of 1.74 acres. Mitigation shall occur through on-site preservation of 13.85 acres of wetland and riparian habitat, on-site rehabilitation of 7.36 acres of riparian habitat, and on-site re-establishment and revegetation of 107.63 acres of riparian habitat for a total of 128.84 acres of wetland riparian habitat to be preserved within the biological open space easement.

BIO-6 Impacts to 234 individuals of Palmer's goldenbush shall be mitigated at a 1:1 ratio. Mitigation shall occur through planting and/or seeding of the species within on-site native revegetation areas in accordance with a revegetation plan to be approved by the County and Wildlife Agencies (USWFS and CDFW).

BIO-8 Upon completion of all extraction activities, reclamation and final grading to establish the final landform shall occur in accordance with the approved Reclamation Plan. Revegetation with native species will occur within the expanded Sweetwater River floodplain and constructed bordering slopes according to a revegetation plan to be approved by the County and Wildlife Agencies (USWFS and CDFW).

BIO-9 Mitigation for impacts to 0.44 acre of southern cottonwood-willow riparian forest, 0.13 acre of disturbed southern willow scrub, 0.01 acre of tamarisk scrub, 0.01 acre of arundo-dominated riparian, and 0.55 acre of disturbed wetland shall occur at a 3:1 ratio with at least 1:1 creation (establishment/re-establishment) for a total mitigation requirement of 3.42 acres. Mitigation

shall occur through on-site preservation of 13.85 acres of wetland and riparian habitat, on-site rehabilitation of 7.36 acres of riparian habitat, and on-site re-establishment and revegetation of 107.63 acres of riparian habitat for a total of 128.84 acres of wetland riparian habitat to be preserved within the biological open space easement.

BIO-10 Mitigation for 1.2 acres of impacts to Diegan coastal sage scrub shall occur at a 1.5:1 ratio with 1.8 acres of Tier II or Tier I habitat in the South County MSCP area within a biological resource core area. Mitigation shall occur through on-site preservation of 0.6 acre of Diegan coastal sage scrub and on-site revegetation of 11.3 acres of Diegan coastal sage scrub for a total of 11.9 acres of Tier II Diegan coastal sage scrub to be preserved within the biological open space easement.

Table 3, *Project Impacts to Sensitive Vegetation Communities and Required Mitigation Summary*, provides a summary of project impacts to sensitive vegetation communities and required mitigation. The applicable conditions of the Resolution of Approval will be attached to the Final Revegetation Mitigation Plan submitted after discretionary approval and prior to issuance of any permit, and prior to occupancy or use of the premises in the reliance of this permit.

Table 3
PROJECT IMPACTS TO SENSITIVE VEGETATION COMMUNITIES AND REQUIRED MITIGATION SUMMARY (acre[s])[1]

Habitat	Impacts	Required Mitigation			
		Ratio	Establishment	Establishment, Re-establishment, Rehabilitation, and/or Enhancement	Total
Tier I					
Disturbed Wetland	0.55	3:1	0.55	1.10	**1.65**
Southern Cottonwood-willow Riparian Forest – including disturbed	0.44	3:1	0.44	0.88	**1.32**
Southern Willow Scrub	0.13	3:1	0.13	0.26	**0.39**
Tamarisk Scrub	0.01	3:1	0.01	0.02	**0.03**
Arundo-Dominated Riparian	0.01	3:1	0.01	0.02	**0.03**
Subtotal	***1.14***	**--**	***1.14***	***2.28***	***3.42***
Tier II					
Diegan Coastal Sage Scrub – including disturbed	1.2	1.5:1	--	1.80	**1.80**
Subtotal	***1.2***	**--**	**--**	***1.80***	***1.80***
TOTAL	**2.34**	**--**	**1.14**	**4.08**	**5.22**

[1] Rounded to the nearest 0.01 acre; totals reflect rounding.

Mitigation for impacts to Tier I riparian habitats and jurisdictional waters and wetlands are addressed separately in the Conceptual Wetland Mitigation Plan (HELIX 2025a). Mitigation for impacts to Tier II upland sensitive habitats (DCSS [including disturbed]) will be met through on-site preservation of 0.6 acre of existing DCSS and the preservation of 11.3 acres of DCSS revegetated as part of site reclamation within a biological open space easement, with no restoration component. The Resolution of Approval, including applicable conditions of approval, will be attached to the Final Revegetation Plan submitted after discretionary approval and prior to grading permit issuance.

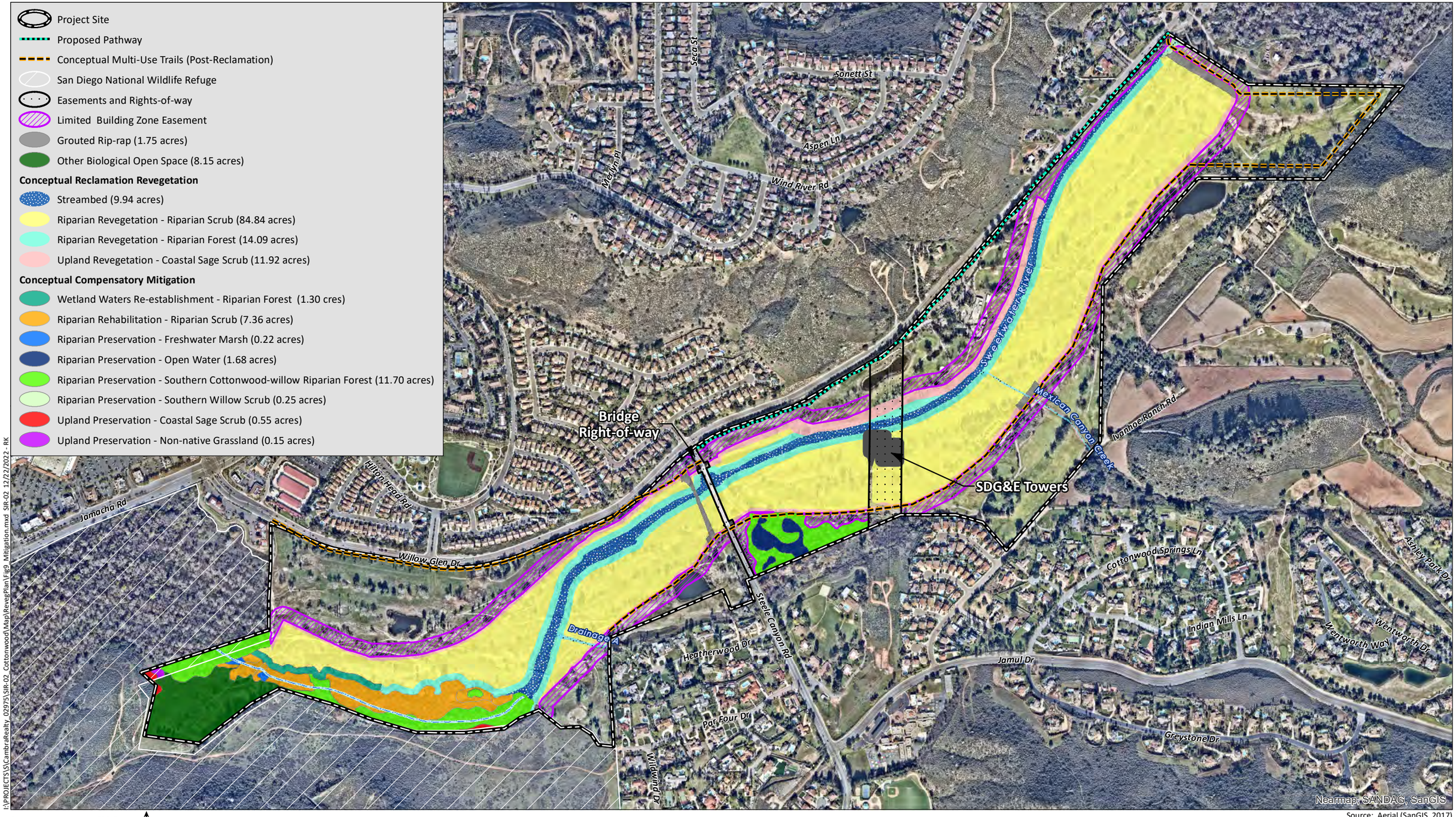
- Project Site
- Proposed Pathway
- Conceptual Multi-Use Trails (Post-Reclamation)
- San Diego National Wildlife Refuge
- Easements and Rights-of-way
- Limited Building Zone Easement
- Grouted Rip-rap (1.75 acres)
- Other Biological Open Space (8.15 acres)

Conceptual Reclamation Revegetation

- Streambed (9.94 acres)
- Riparian Revegetation - Riparian Scrub (84.84 acres)
- Riparian Revegetation - Riparian Forest (14.09 acres)
- Upland Revegetation - Coastal Sage Scrub (11.92 acres)

Conceptual Compensatory Mitigation

- Wetland Waters Re-establishment - Riparian Forest (1.30 cres)
- Riparian Rehabilitation - Riparian Scrub (7.36 acres)
- Riparian Preservation - Freshwater Marsh (0.22 acres)
- Riparian Preservation - Open Water (1.68 acres)
- Riparian Preservation - Southern Cottonwood-willow Riparian Forest (11.70 acres)
- Riparian Preservation - Southern Willow Scrub (0.25 acres)
- Upland Preservation - Coastal Sage Scrub (0.55 acres)
- Upland Preservation - Non-native Grassland (0.15 acres)



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Source: Aerial (SanGIS, 2017)

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HELIX Environmental Planning

Conceptual Reclamation Revegetation and Compensatory Mitigation Areas

Figure 9

2.3.10 Mining Reclamation

Areas temporarily disturbed by mining activities are required to be reclaimed in accordance with the Reclamation Standards as identified in the Public Resources Code, Article 9, Section 3705, and Sections 1810 and 6550-6556 of the County Zoning Ordinance. Extraction activities will temporarily impact approximately 211.94 acres which are required to be reclaimed. Reclamation includes revegetation of areas that contained vegetation prior to mining.

Additionally, Section 86.605(d) of the County RPO (County 2011) requires that the project implement the following mitigation measures as conditions of the project's Major Use Permit:

- Any wetland buffer area shall be restored to protect environmental values of adjacent wetlands;
- In a floodplain, any net gain in functional wetlands and riparian habitat shall result in or adjacent to the area of extraction;
- Native vegetation shall be used on steep slope lands to revegetate and landscape cut and fill areas to substantially restore the original habitat value, and slopes shall be graded to produce contours and soils which reflect a natural landform, which is consistent with the surrounding area; and
- Mature riparian woodland may not be destroyed or reduced in size due to sand, gravel, or mineral extraction.

Currently, wetland buffer areas within the project site consist of patches of existing riparian habitat and extensive areas of golf course development bordering the Sweetwater River. To meet the requirements of the RPO, wetland buffer areas disturbed by mining will be restored via a combination of re-establishment of wetland waters and riparian habitat addressed in the Conceptual Wetland Mitigation Plan (HELIX 2025a) and native habitat revegetation addressed in this plan (Figures 10a through 10e, *Conceptual Reclamation Revegetation Areas*).

The proposed project would involve the widening of the Sweetwater River floodplain by lowering existing upland elevations to a final height that is similar to, or slightly above, that of the existing Sweetwater River low-flow Sweetwater River channel. The expanded floodplain will be revegetated with wetland and riparian forest and scrub habitat resulting in a net gain of functional wetlands and riparian habitat. Cut slopes constructed along the margins of the expanded floodplain will be revegetated with native upland habitat (i.e., DCSS), improving upon the current site conditions and resulting in a biologically superior condition.

Existing RPO wetlands within the project site shall be preserved in place and their existing environmental values shall be enhanced through the rehabilitation of existing riparian habitat addressed in the Conceptual Wetland Mitigation Plan (HELIX 2025a). All riparian re-establishment and rehabilitation addressed in the mitigation plan, combined with the revegetation addressed in this plan, shall be preserved within a biological open space easement and managed in perpetuity in accordance with the Conceptual Resource Management Plan (HELIX 2025c).

3.0 GOALS OF REVEGETATION

The goal of this revegetation plan is to provide sufficient vegetative cover to the reclaimed site such that the soil surface is stabilized, existing wetland buffer areas are restored, long-term erosion is prevented, and the post extractive land use objectives of the site are met.

3.1 RESPONSIBILITIES

3.1.1 Project Proponent

New West Investment, Inc. (or its successor in interest, in the event a sale of the property takes place) will be responsible for financing the installation, maintenance, and monitoring of the proposed on-site revegetation effort. Ultimately, the native habitat revegetation areas, together with all biological open space designated on-site, may be transferred in fee title (subject to County approval) to a public or private entity specializing in the long-term management of open space. If such a transfer were to occur prior to County sign-off of the implemented mitigation and revegetation effort, this entity would become responsible for the maintenance program described herein.

3.1.2 County of San Diego

As part of the monitoring program, annual reports prepared by the Restoration Specialist will be submitted to the County and Wildlife Agencies (USFWS and CDFW). The County will review these reports for completeness and will determine the success of the revegetation effort together with the Wildlife Agencies.

3.1.3 Revegetation Project Designer

The Final Revegetation Plans (i.e., revegetation construction drawings) will consist of construction drawings, including irrigation and planting plans, prepared by a California registered landscape architect. These plans will meet the requirements set forth in Section 2.11 of the County's Report Format and Content Requirements for Revegetation Plans (County 2007). The Landscape Architect will inspect the irrigation system prior to seeding and planting, as needed, to help ensure proper installation and complete coverage of the revegetation area while minimizing runoff into the adjacent habitat.

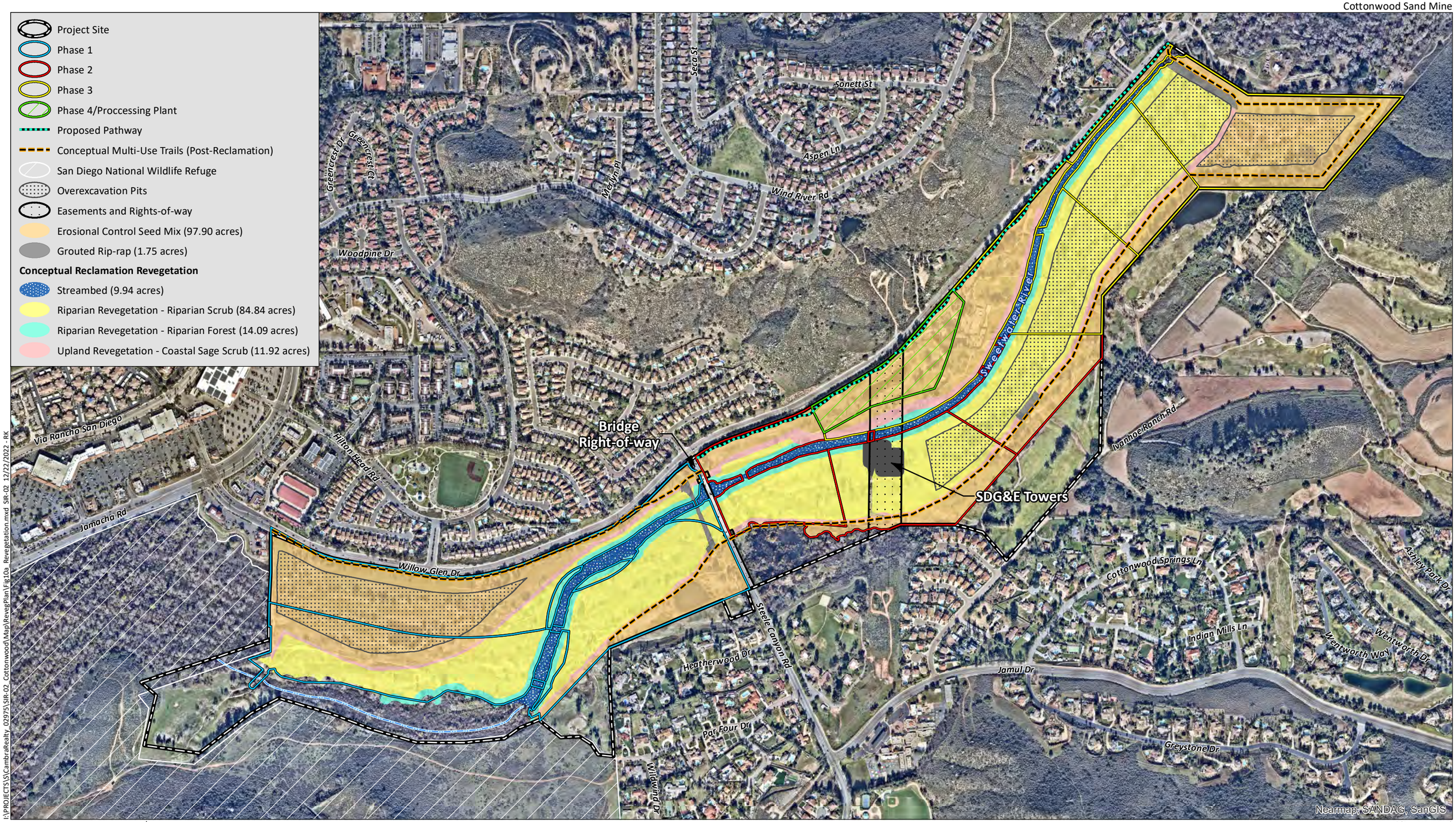
3.1.4 Grading Contractor

The Grading Contractor will be responsible for salvaging topsoil from each mining subphase prior to impacts, in coordination with the Restoration Specialist. Following the completion of all mining activities in each mining subphase, the Grading Contractor will establish final grades and install salvaged topsoil per the Final Mitigation and Revegetation Plans (grading plans). As part of the project, approximately 2.5 million CY of soil material will be imported to the site to backfill areas excavated as part of mining operations and complete final grades. Imported soils are anticipated to be used in construction of the upland slopes and backfilling of an excavation pit in Phases 2 and 3 (Figure 10a, *Conceptual Reclamation Revegetation Areas – Overview*). Imported soil material used in the native revegetation areas would meet specifications provided by the Restoration Specialist to ensure that the soils are appropriate for the targeted vegetation type. The contractor will have at least five years of experience in successful

- Project Site
- Phase 1
- Phase 2
- Phase 3
- Phase 4/Proccessing Plant
- Proposed Pathway
- Conceptual Multi-Use Trails (Post-Reclamation)
- San Diego National Wildlife Refuge
- Overexcavation Pits
- Easements and Rights-of-way
- Erosional Control Seed Mix (97.90 acres)
- Grouted Rip-rap (1.75 acres)

Conceptual Reclamation Revegetation

- Streambed (9.94 acres)
- Riparian Revegetation - Riparian Scrub (84.84 acres)
- Riparian Revegetation - Riparian Forest (14.09 acres)
- Upland Revegetation - Coastal Sage Scrub (11.92 acres)



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Source: Aerial (SanGIS, 2019)

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Conceptual Reclamation Revegetation Areas - Overview

Figure 10a

- Project Site
- Phase 1
- Phase 2
- Phase 3
- Phase 4/Proccessing Plant
- Proposed Pathway
- Conceptual Multi-Use Trails (Post-Reclamation)
- San Diego National Wildlife Refuge
- Overexcavation Pits
- Easements and Rights-of-way
- Erosional Control Seed Mix
- Grouted Rip-rap

Conceptual Reclamation Revegetation

- Streambed
- Riparian Revegetation - Riparian Scrub
- Riparian Revegetation - Riparian Forest
- Upland Revegetation - Coastal Sage Scrub

Bridge Right-of-way

SDG&E Towers

Greencrest Dr
Greencrest Ct
Madlyn Pl
Seca St
Sonett St
Aspen Ln
Wind River Rd
Woodpine Dr
Sweetwater River
Ivanhoe Ranch Rd
Via Rancho San Diego
Hilton Head Rd
Jamacha Rd
Willow Glen Dr
Steele Canyon Rd
Heatherwood Dr
Par Four Dr
Wildwind Dr
Jamul Dr
Cottonwood Springs Ln
Indian Mills Ln
Greystone Dr
Ashley Park Dr
Wentworth Way
Wentworth Dr

Nearmap, SANDAG, SanGIS

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Source: Aerial (SanGIS, 2019)

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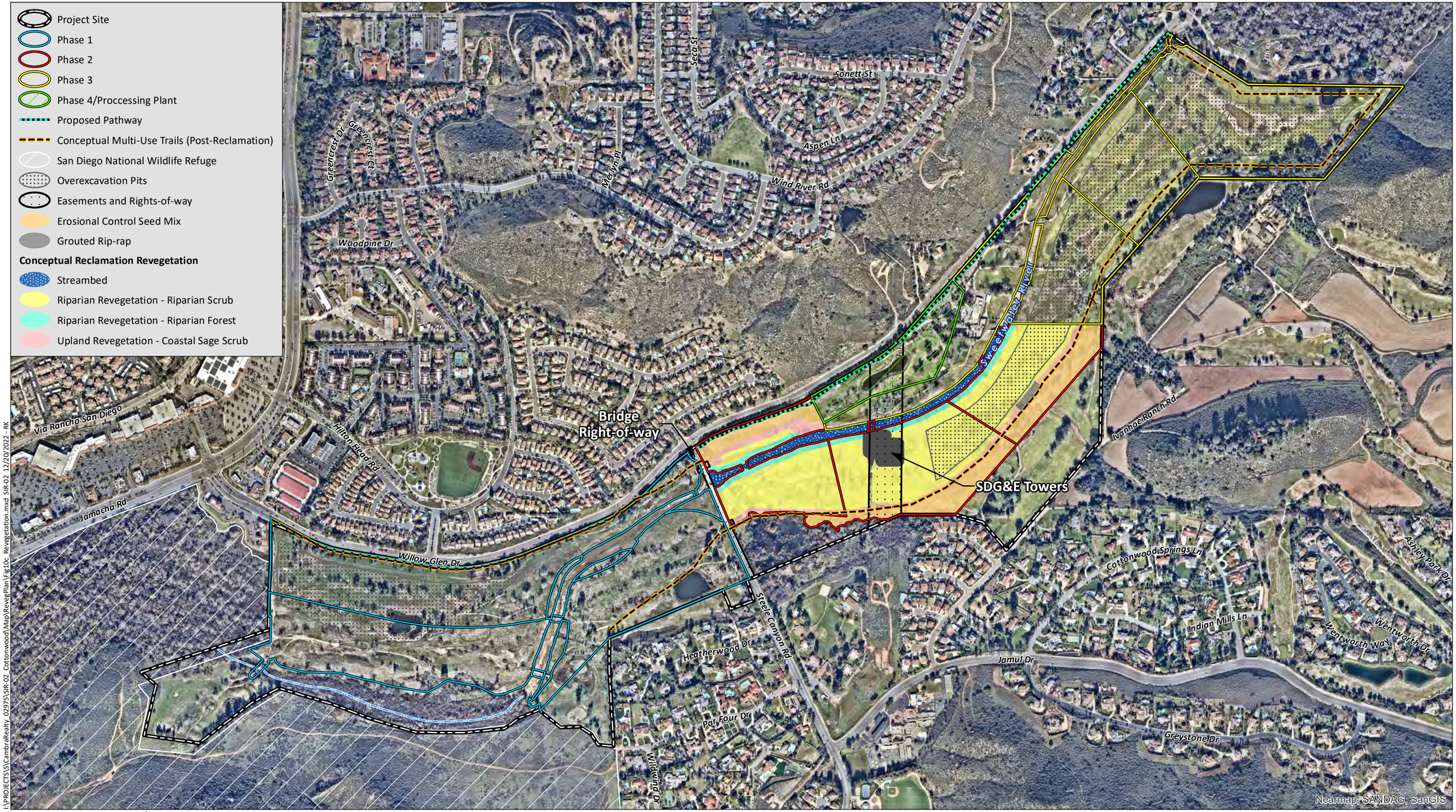
Conceptual Reclamation Revegetation Areas - Phase 1

Figure 10b

- Project Site
- Phase 1
- Phase 2
- Phase 3
- Phase 4/Proccessing Plant
- Proposed Pathway
- Conceptual Multi-Use Trails (Post-Reclamation)
- San Diego National Wildlife Refuge
- Overexcavation Pits
- Easements and Rights-of-way
- Erosional Control Seed Mix
- Grouted Rip-rap

Conceptual Reclamation Revegetation

- Streambed
- Riparian Revegetation - Riparian Scrub
- Riparian Revegetation - Riparian Forest
- Upland Revegetation - Coastal Sage Scrub



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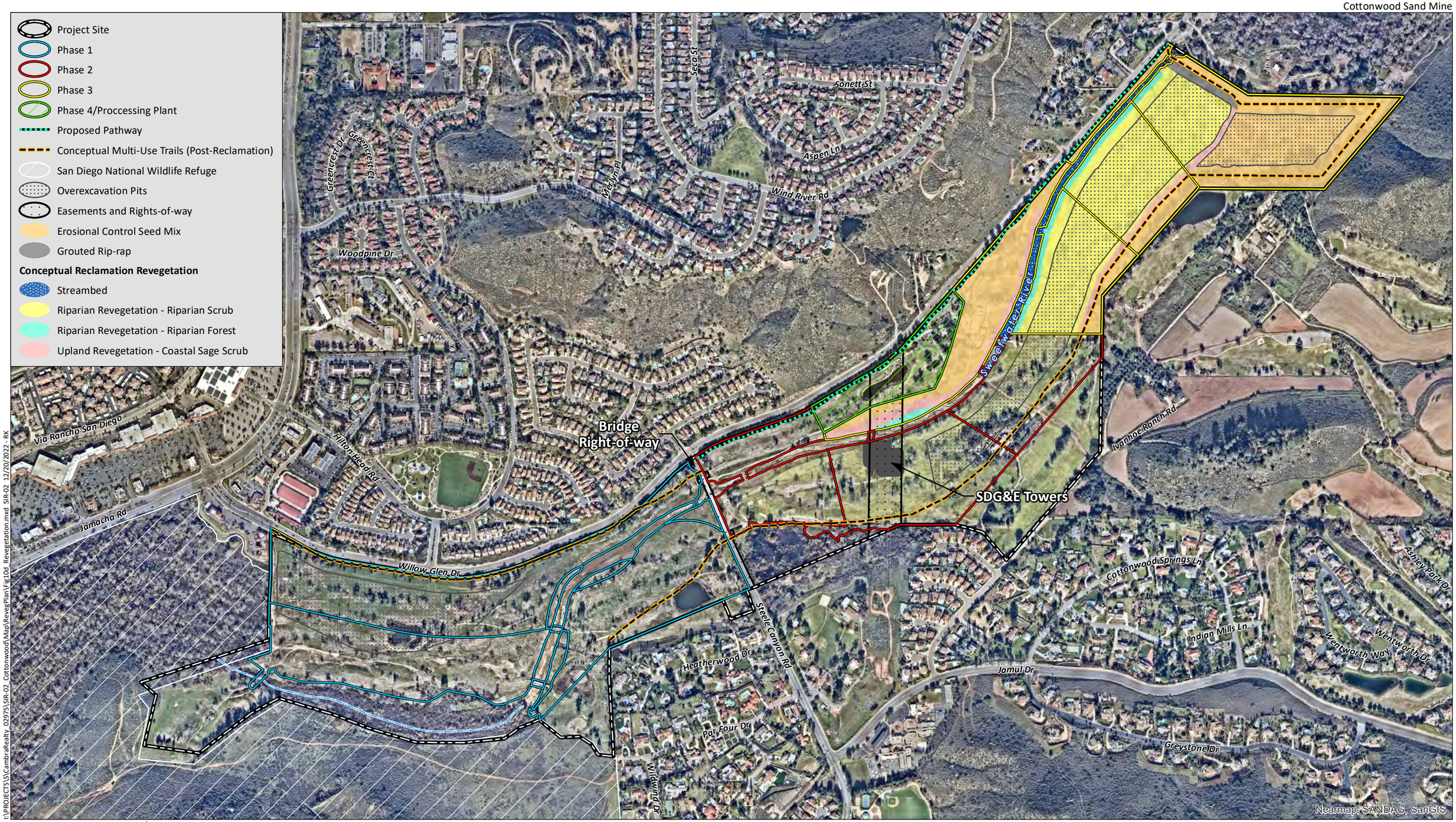
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Source: Aerial (SanGIS, 2019)

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Conceptual Reclamation Revegetation Areas - Phase 2

Figure 10c



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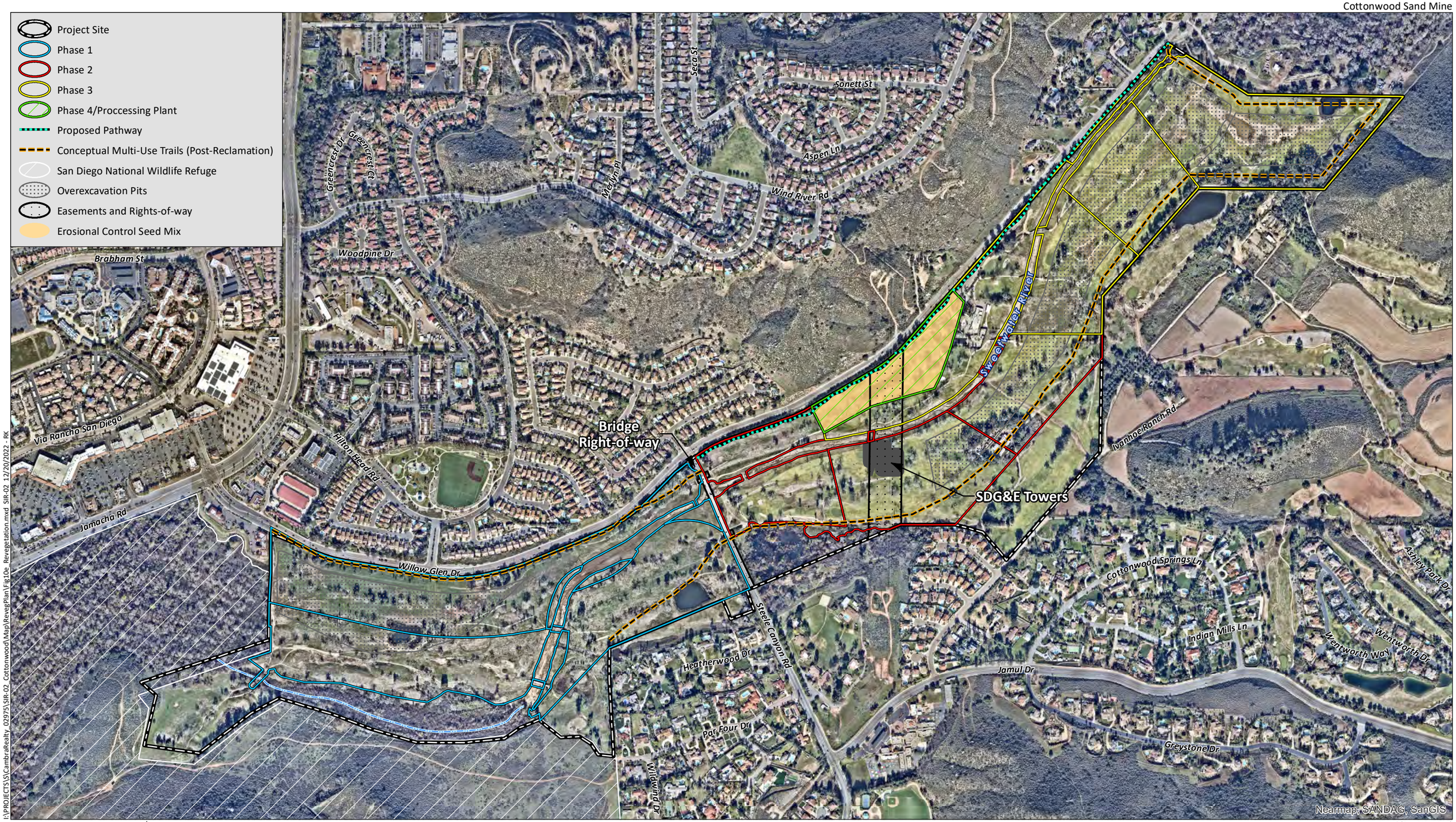
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Source: Aerial (SanGIS, 2019)

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Conceptual Reclamation Revegetation Areas - Phase 3

Figure 10d



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Source: Aerial (SanGIS, 2019)

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Conceptual Reclamation Revegetation Areas - Phase 4

Figure 10e

mine reclamation grading. Final grading, use of imported soil material, and topsoil application will be coordinated with the Restoration Specialist.

3.1.5 Installation Contractor

The Installation Contractor will have at least five years of experience in successful native upland and wetland habitat restoration in Southern California and be under the direction of the Restoration Specialist, who will assist the contractor with the installation of the target vegetation type. Different contractors may be used for the installation and maintenance phases of the revegetation effort, or they may be the same entity. The Project Proponent may change contractors at its discretion, as long as the contractor has the required level of experience, as stated above. Installation may include, but is not limited to, ordering plantings and seed, removing non-native plants and trash, mulching dead trees, installing irrigation lines, container plants, and seed.

3.1.6 Restoration Specialist

Overall supervision of the installation, maintenance, and monitoring of this revegetation effort will be the responsibility of a qualified Restoration Specialist with at least five years of experience with successful native upland and wetland habitat restoration in Southern California. The Restoration Specialist will oversee the efforts of the Installation and Maintenance Contractor(s) for the duration of the revegetation effort. Specific tasks of the Restoration Specialist include educating all participants with regard to revegetation goals and requirements, as well as directly overseeing final grading, topsoil application, weeding, planting, and seeding, as well as maintenance activities for the duration of the five-year maintenance period. The Restoration Specialist will explain to the contractor how to avoid impacts to existing sensitive habitat and sensitive species. When necessary to keep the revegetation effort on track to meet final success criteria, the Restoration Specialist will provide the project proponent and contractor with a written monitoring memorandum, including a list of items in need of attention. The Restoration Specialist also will conduct annual assessments of the revegetation effort and prepare and submit an annual report to the County and Wildlife Agencies each year during the five-year maintenance and monitoring period.

3.1.7 Maintenance Contractor

The Maintenance Contractor will have at least five years of experience in successful native upland and wetland habitat restoration in Southern California and be under the direction of the Restoration Specialist, who will assist the contractor with the maintenance of the target vegetation type. Different contractors may be used for the installation and maintenance phases of the revegetation effort, or they may be the same entity. The Project Proponent may change contractors at its discretion, as long as the contractor has the required level of experience, as stated above. The Maintenance Contractor will service the entire revegetation area as required, meet the Restoration Specialist at the site when requested, and perform all checklist items in a timely manner as directed by the project proponent. This contractor will be knowledgeable regarding the maintenance of native habitat and the difference between native and non-native plants. Maintenance would include but not be limited to non-native plant species control, trash removal, irrigation adjustments and repairs, and potentially re-seeding and/or re-planting. All maintenance activities would be seasonally appropriate and approved by the Restoration Specialist.

3.1.8 Nursery (Seed/Plant Procurement)

Plants and seed may be purchased from a nursery or supplier specializing in native plants or contract grown. Plant and seed material should be locally propagated and collected from central San Diego County, within 25 miles of the site. Plant/seed orders should be placed by the Installation Contractor at least six months prior to installation.

3.2 TYPES AND AREAS OF HABITAT TO BE REVEGETATED

Areas temporarily disturbed by mining activities are required to be reclaimed in accordance with the Reclamation Standards as identified in the Public Resources Code, Article 9, Section 3705, and Sections 1810 and 6550-6556 of the County Zoning Ordinance. Additionally, wetland buffer areas disturbed as part of mining activities are required to be restored in accordance with Section 86.605(d) of the County RPO (County 2011). A portion of the reclaimed area, totaling 1.3 acres, will be re-established to wetland waters and riparian habitat to fulfill compensatory mitigation requirements as described in the Conceptual Wetland Mitigation Plan (HELIX 2025a). A total of 218.69 acres of remaining reclamation shall consist of 108.87 acres of wetland and riparian forest and riparian scrub revegetation located within the widened Sweetwater River floodplain, 11.92 acres of native upland (DCSS) revegetation on cut slopes, and 97.90 acres of erosion control on level pads that will be seeded with an erosion control seed mix (Figure 9; Table 4, *Reclamation Revegetation by Mining Phase*).

Table 4
RECLAMATION REVEGETATION BY MINING PHASE
(acre[s])[1]

Habitat Type	Mining Phase				Total
	Phase 1	Phase 2	Phase 3	Phase 4	
Native Habitat Revegetation					
Diegan Coastal Sage Scrub	2.94	3.27	5.71	0	11.92
Upland Revegetation Subtotal	*2.94*	*3.27*	*5.71*	*0*	*11.92*
Riparian Forest	7.41	3.63	3.05	0	14.09
Riparian Scrub	28.68	28.11	28.05	0	84.84
Streambed (Emergent Wetland)	4.02	3.55	2.37	0	9.94
Wetland/Riparian Revegetation Subtotal	*40.11*	*35.29*	*33.47*	*0*	*108.87*
Native Habitat Revegetation Total	**43.05**	**38.56**	**39.18**	**0**	**120.79**
Other Reclamation					
Erosion Control Mix	39.68	12.30	36.73	9.19	97.90
TOTAL	**82.73**	**50.86**	**75.91**	**9.19**	**218.69**

[1] Areas are presented in acre(s) rounded to the nearest 0.01.

In addition to the compensatory mitigation and reclamation revegetation requirements, the project is required to provide species-specific mitigation for impacts to Palmer's goldenbush in accordance with mitigation measure BIO-6 (HELIX 2025b). Impacts to 234 Palmer's goldenbush shall be mitigated at a 1:1 ratio through planting and/or seeding of the species within on-site native revegetation areas in accordance with this plan.

3.3 FUNCTIONS AND VALUES

Native habitat revegetation will (1) increase the value of the existing riparian corridor for native flora and fauna; (2) improve areas mapped as USFWS critical habitat for San Diego ambrosia, least Bell's vireo, and coastal California gnatcatcher; (3) provide additional cover for wildlife movement; and (4) provide foraging and nesting habitat for riparian species known from the area, many of which are sensitive, such as least Bell's vireo, yellow warbler, and yellow-breasted chat (HELIX 2025b). The expanded floodplain and revegetated native habitat are expected to provide functions and services typical of naturally occurring intermittent stream channels, such as stream-energy dissipation, to reduce erosion and improve water quality, groundwater recharge, sediment transport, water purification, and foraging, breeding, live-in, and dispersal habitat for wildlife. At the end of five years of maintenance and monitoring, the native revegetation area is expected to provide self-sustaining native habitat (i.e., capable of self-regeneration without continued dependence on irrigation, soil amendments, or fertilizer) that continues on the trajectory toward developing functions and values of adjacent native habitat without further active management.

A total of 97.90 acres of flat or gently sloped areas outside of the riparian corridor will be hydroseeded with an erosion control mix to aid in soil stabilization and control erosion. These upland areas are not expected to support native habitat; however, native wildlife may use these areas as foraging habitat.

3.4 TIME LAPSE

Mining operations will occur in three separate phases, in addition to a fourth phase for final reclamation, site cleanup, and equipment removal. It is anticipated that all four phases of mining and final reclamation will be completed in approximately 16 years (Table 5, *Approximate Timing of Mining and Reclamation Activities*). Each of the three main mining phases will include multiple subphases, with each subphase totaling less than 30 acres per phase. Each subphase will begin with vegetation removal, followed by topsoil salvage, resource extraction, backfilling, and finally reclamation of the impacted area. While the precise location and timing of mining and reclamation subphases are subject to market demand and variations in geologic conditions encountered in the field, overall mining followed by reclamation for each subphase will progress, as shown on Figure 5. Reclamation, and subsequent revegetation, will occur within each subphase immediately following the completion of mining activities. Reclamation shall consist of backfilling of excavated areas, grading of final contours, application of salvaged topsoil, and planting of container stock and/or application of seed mix. Sign-off of the revegetation effort is expected by the end of the five-year maintenance and monitoring period for each individual subphase.

Table 5
APPROXIMATE TIMING OF MINING AND RECLAMATION ACTIVITIES

Mining Phase	Acres	Mining			Reclamation		
		Mining Duration (Years)	Mining Initiation Date (est.)	Mining Completion Date (est.)	Reclamation Completion Date (est.)	Revegetation Initiation Date (est.)	Revegetation Completion Date (est.)
Phase 1							
Subphase 1A	22.20	1	2025	2026	2028	2028	2033
Subphase 1B	26.46	1	2026	2027	2029	2029	2034
Subphase 1C	30.42	1	2027	2028	2030	2030	2035
Phase 1 Total	***78.98***	***3***	***2025***	***2028***	***2030***	***2028***	***2023***
Phase 2							
Subphase 2A	15.26	1	2028	2029	2031	2031	2036
Subphase 2B	19.08	1	2029	2030	2032	2032	2037
Subphase 2C	13.74	1	2030	2031	2033	2033	2038
Phase 2 Total	***48.18***	***3***	***2028***	***2031***	***2033***	***2033***	***2038***
Phase 3							
Subphase 3A	29.42	1	2031	2032	2034	2034	2039
Subphase 3B	16.15	1	2032	2033	2035	2035	2040
Subphase 3C	14.13	1	2033	2034	2036	2036	2041
Subphase 3D	18.87	1	2034	2035	2037	2037	2042
Phase 3 Total	***78.57***	***4***	***2031***	***2035***	***2037***	***2037***	***2042***
Phase 4	8.65	<1	2035	2035	2037	2037	2042
TOTAL	**214.4**	**10***	**2025**	**2035**	**2037**	**2037**	**2042**

* Reclamation activities would occur concurrently with mining operations. Phase 4 is not considered as part of the mining duration (10 years) since it involves the final work for reclamation rather than an active mining phase for the entire duration.

Compensatory mitigation for impacts to riparian habitat, other sensitive vegetation communities, and jurisdictional waters and wetlands will occur prior to or concurrent with initiation of project grading for Phase 1 (Table 6, *Compensatory Mitigation and Reclamation Revegetation Phasing*). Preservation of existing native riparian habitat and riparian habitat rehabilitation will occur prior to or concurrent with initiation of project grading for Subphase 1A. Initiation of wetland waters re-establishment would occur prior to or during the fall of the year in which project reclamation is completed, and revegetation is initiated for Subphase 1B. Sign off of the on-site wetland mitigation effort is expected by the end of the five-year maintenance and monitoring period.

Table 6
COMPENSATORY MITIGATION AND RECLAMATION PHASING
(acre[s])[1]

Habitat	Phase 1		Phase 2		Phase 3		Phase 4		Total	
	M[2]	R[2]	M[2]	R[2]	M[2]	R[2]	M[2]	R[2]	M[2]	R[2]
Conceptual Reclamation Revegetation										
Native Habitat Revegetation										
Riparian Forest	0	7.41	0	3.63	0	3.05	0	0	0	14.09
Riparian Scrub	0	28.68	0	28.11	0	28.05	0	0	0	84.84
Streambed (Emergent Wetland)	0	4.02	0	3.55	0	2.37	0	0	0	9.94
Coastal Sage Scrub	0	2.94	0	3.27	0	5.71	0	0	0	11.92
Subtotal	*0*	*43.05*	*0*	*38.56*	*0*	*39.18*	*0*	*0*	*0*	*120.79*
Other Reclamation										
Erosion Control Areas	0	39.68	0	12.30	0	36.73	0	9.19	0	97.90
Revegetation Total	***0***	***82.73***	***0***	***50.86***	***0***	***75.91***	***0***	***9.19***	***0***	***218.69***
Conceptual Compensatory Mitigation										
Wetland Waters Re-Establishment										
Riparian Forest	1.30	0	0	0	0	0	0	0	1.30	0
Rehabilitation										
Riparian Scrub	7.36	0	0	0	0	0	0	0	7.36	0
Preservation										
Open Water	1.68	0	0	0	0	0	0	0	1.68	0
Freshwater Marsh	0.22	0	0	0	0	0	0	0	0.22	0
Southern Cottonwood-Willow Riparian Forest	11.70	0	0	0	0	0	0	0	11.70	0
Southern Willow Scrub	0.25	0	0	0	0	0	0	0	0.25	0
Coastal Sage Scrub	0.55	0	0	0	0	0	0	0	0.55	0
Non-native grassland	0.15	0	0	0	0	0	0	0	0.15	0
Mitigation Total	**23.21**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**15.53**	**0**
TOTAL	**23.21**	**82.73**	**0**	**50.68**	**0**	**75.91**	**0**	**9.19**	**23.21**	**218.69**

[1] Areas are presented in acre(s) rounded to the nearest 0.01.
[2] M = Compensatory Mitigation; R = Reclamation Native Habitat Revegetation.

3.5 COST

A draft cost of $450,000 for the life of the project for biological monitoring and reporting, and approximately $100,000 per acre on average for the native revegetation installation and maintenance for five years was estimated for the overall reclamation addressed in this plan (averaged for irrigated and non-irrigated areas). Due to the extended nature of this project, this cost is preliminary and does not include the cost of inflation. This cost also does not include any grading, topsoil salvage or application, maintenance during the construction period, fencing installation/repairs, or erosion control for native habitat revegetation areas.

4.0 DESCRIPTION OF THE REVEGETATION AREAS

4.1 SITE SELECTION

Target habitat types to be revegetated within the portions of the site disturbed by mining activities were selected based on proposed final landform contours, landscape position, hydrology, existing habitats, and other biological factors. Post-reclamation, the site's final landform will be a relatively flat plain that gently slopes downward from east to west, with a widened river floodplain bisecting the length of the site. The widened floodplain is expected to average approximately 450 to 720 feet in width and would be lower in elevation than the existing ground level across the site. The existing low-flow river channel would be retained in place with banks up to a minimum height of 3.5 feet to accommodate annual water transfers from Loveland Reservoir (located upstream of the site) to Sweetwater Reservoir (located downstream of the site) that are controlled by the Sweetwater Authority. The low-flow river channel banks would slope down to the expanded floodplain, which will be at a similar elevation to the existing low-flow river channel or slightly higher. In some areas, benches may be constructed at the edges of the floodplain to accommodate varying vegetation types. Slopes bordering the expanded floodplain would slope up at a 3:1 ratio or shallower, with an elevation difference of up to 25 feet between the top of slope and bottom of the expanded floodplain.

The widened river floodplain shall be vegetated with riparian forest habitat within approximately 50 feet of the existing channel, and riparian scrub habitat in the remainder of the floodplain (Figure 9). Riparian habitat occurs immediately upstream and downstream of the project site, indicating that the site contains suitable hydrology to support riparian habitat. Sweetwater River conveys intermittent flows that are artificially modified by the Sweetwater Authority, which conducts controlled releases and water transfers from Loveland Reservoir (located upstream of the site) to Sweetwater Reservoir (located downstream of the site). The existing low-flow river channel would be retained in place to convey these flows. Exotic and non-native plant species within the low-flow river channel would be removed and the streambed would be seeded with an emergent wetland seed mix. The broadened floodplain area bordering the river shall be graded to an elevation similar to or slightly higher than the low-flow river channel bottom which will allow floodwaters that breach the low-flow channel to spread out in the adjacent floodplain area. Mapped soils within the widened river channel are primarily Riverwash and Visalia Sandy Loam (Figure 6), which are frequently found in alluvial floodplains within and near wetlands. Additionally, the soil and geologic study conducted by Geocon found alluvial channel and alluvial floodplain deposits within the expanded floodplain and riparian forest and riparian scrub revegetation areas at and below the final grade depth which is estimated to be between 320 and 355 AMSL (Geocon 2020). The expanded floodplain in Phases 1a to 1c and Phase 2a will be mined to final elevation heights and are not anticipated to require backfilling with imported material. Portions of expanded floodplain in Phases 2b and 2c and Phases 3a to 3c that overlap with an excavation pit would be excavated below the final elevation heights and backfilled with wash fines and imported material that would consist of inert debris (Figure 10a). Imported soils within the expanded floodplain would be required to meet specifications provided by the Restoration Specialist to ensure that the soils are appropriate for the targeted vegetation type.

The slopes bordering the widened river channel shall be vegetated with DCSS (Figure 10a), which occurs within the project site and surrounding area (Figure 7). The flat graded pads outside of the widened river floodplain shall be seeded with an erosion control seed mix in an effort to stabilize soils and prevent erosion.

- Project Site
- Proposed Pathway
- Conceptual Multi-Use Trails (Post-Reclamation)
- Open Space Conceptual Signage Location
- Existing Fencing
- Proposed Fencing
- Easements and Rights-of-way
- Limited Building Zone Easement
- Biological Open Space
- Non-Biological Open Space
- Additional Reclaimed Areas*
- Retained in Existing Condition

**Additional reclaimed areas are composed of graded upland pads located outside of the expanded Sweetwater River floodplain that will be seeded with an erosion control seed mix.*

Jamacha Way
Sonett St
Aspen Ln
Wind River Rd
Sweetwater River
Sea Pines Rd
Via Rancho San Diego
Bridge Right-of-way
SDG&E Towers
Ivanhoe Ranch Rd
Augusta Ct
Jamacha Rd
Hilton Head Rd
Access Road
Willow Glen Dr
SDG&E Easement
Steele Canyon Rd
Cottonwood Springs Ln
Ashley Park Dr
Indian Mills Ln
Wentworth Way
Heatherwood Dr
Jamul Dr
Par Four Dr
Greystone Dr

Nearmap, SANDAG, SanGIS

0 700 Feet

N

Source: Aerial (SanGIS, 2019)

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HELIX Environmental Planning

Proposed Biological Open Space

Figure 11

4.2 LOCATION AND SIZE OF REVEGETATION AREAS

The revegetation area is located on-site, between approximately 32.753919 and 32.740810 north latitude, and between -116.905365 and -116.928629 west longitude. A total of 218.69 acres of disturbed areas would be reclaimed and revegetated; 108.87 acres of wetland and riparian forest and riparian scrub revegetation located within the widened Sweetwater River floodplain, 11.92 acres of cut slopes that would be revegetated with native upland vegetation (DCSS), and 97.90 acres of level pads to be seeded with an erosion control seed mix (Figure 11, *Conceptual Biological Open Space*). Additionally, 1.30 acres of wetland waters re-establishment would be completed as detailed within the Conceptual Wetland Mitigation (HELIX 2025a).

In addition to the revegetation areas, wetland restoration to fulfill the project's compensatory mitigation requirements will occur contiguously with the proposed revegetation, at the downstream portion of the Sweetwater River, in the southwestern portion of the site (Figure 9). The wetland mitigation effort, which includes a total of 22.51 acres of wetland waters re-establishment, rehabilitation, and preservation of wetland and riparian habitat on-site, is detailed in the Conceptual Wetland Mitigation Plan (HELIX 2025a).

4.3 FUNCTIONS AND VALUES

The areas proposed for revegetation are currently characterized by golf course fairways and associated infrastructure (i.e., cart paths, artificial ponds, clubhouse, etc.), ruderal vegetation and disturbed habitat associated with previous golf course development and operation, and a mixture of native and non-native planted landscaped trees. The existing functions and values of these areas are limited as a result of previous development into a golf course; the area is currently dominated by Bermuda grass (*Cynodon dactylon*) or bare ground. Planted trees within the golf course currently provide potential breeding habitat for bird species such as the sensitive western bluebird, which was observed throughout the project site (HELIX 2025b). Patches of existing riparian habitat located east of Steele Canyon Road and in the downstream portion of the Sweetwater River provide habitat for birds, small rodents and mammals, and lizards and amphibians for both foraging, breeding, and live-in habitat. The least Bell's vireo was detected within this area during biological surveys conducted in 2019 and 2022 and confirmed to be breeding within existing riparian habitat located to the east of Steele Canyon Road (HELIX 2025b).

4.4 PRESENT AND PROPOSED USES

The current general land uses on the project site include a public golf course in addition to expanded fairways associated with golf course improvements. Construction of the golf course began in the 1960s and continued into the 1970s as the golf course expanded and improved. The site currently contains one operational and one abandoned public golf course (golf play and maintenance of landscaped turf in the western portion of the site was discontinued in 2017). The proposed project would convert the two golf courses into a sand mining operation that would be conducted in three phases over 10 years, with a final fourth phase for cleanup, equipment removal, and final reclamation.

Following mining and reclamation activities, the project site would be characterized by an expanded Sweetwater River floodplain and associated riparian corridor that would be preserved within the project's biological open space (Figure 11). The biological open space would be managed over the long term by a habitat manager according to a Resource Management Plan (HELIX 2025c). Hiking trails are proposed to be established around the perimeter of the biological open space area following site

reclamation; no hiking trails are proposed within the expanded Sweetwater River floodplain or associated DCSS slopes.

There are two easements that bisect the biological open space that would remain following mining activities and site reclamation. One of the easements consists of the Steele Canyon Road bridge right-of-way (ROW) that occurs within the central portion of the site (Figure 7). The Steele Canyon Road bridge ROW comprises the Steele Canyon Road bridge and associated footings that bisect the project's biological open space in a generally north-to-south direction across the Sweetwater River. The Steele Canyon Road bridge ROW has been excluded from the biological open space; therefore, the presence of the bridge ROW is not expected to affect the long-term viability and management of the biological open space. The second easement consists of a San Diego Gas & Electric (SDG&E) easement, which occurs within the central portion of the site, east of Steele Canyon Road, and crosses over the northeastern portion of the project site, where reclamation and revegetation activities are proposed to occur (Figure 9). The SDG&E easement bisects the project's biological open space area. The easement consists of overhead utility lines that run in a north/south direction across the Sweetwater River. Three transmission tower poles and other associated infrastructure have been excluded from the biological open space; therefore, the presence of the SDG&E easement is not expected to affect the long-term viability and management of the biological open space.

A small portion of the area to be revegetated with native habitat following mining activities, approximately 3.16 acres, would occur within the SDG&E and would be excluded from the biological open space area. The easement will be revegetated with the same plant palette as the rest of the revegetation area. Existing elevations would be lowered by 15 to 20 feet, but the three transmission towers would remain at their current elevation, leaving a raised "island" within the expanded Sweetwater River floodplain. An access ramp would be constructed on the western side of the island to connect to a 28-foot-wide access road within the existing SDG&E right-of-way easement that runs from the towers to the top of the constructed southern slope at the southern boundary of the expanded floodplain. The ramp, access road, and slopes surrounding the towers would be compacted and lined, as needed, for access and to prevent erosion. It is expected that periodic trimming of vegetation to facilitate vehicle access by SDG&E maintenance crews would need to be conducted within the access road. This work would be conducted as needed by SDG&E. Fencing and signage would be installed along the ramp and access road to prevent unauthorized access and impacts to the native habitat revegetation area and biological open space located adjacent to the access road.

4.5 REVEGETATION REFERENCE SITE

Native habitat within the southwestern portion of the site was used as a reference site for the riparian forest and scrub habitats and DCSS habitat. Revegetation goals and success criteria presented in this plan have been based on visual estimates of native cover noted in the reference site during biological surveys conducted for the biological technical report (HELIX 2025b). No reference site was established for erosion control areas.

5.0 IMPLEMENTATION PLAN

This section provides the details for the execution of the proposed revegetation.

5.1 RATIONALE FOR EXPECTING IMPLEMENTATION SUCCESS

The proposed revegetation effort is anticipated to be successful based on the following: (1) occurrence of healthy native upland and wetland vegetation within the project site; (2) the presence of appropriate soils within the riparian forest and riparian scrub revegetation areas following completion of mining activities based on the project's geologic study (Geocon 2020), proposed post-reclamation final landforms and elevations, and requirements for use of imported soils within the expanded floodplain based on the specifications provided by, and approval of, the Restoration Specialist; (3) flows through the nearby existing Sweetwater River channel, and associated groundwater levels, combined with natural rainfall and periodic surface flooding following major rain events, are expected to provide sufficient hydrology to support riparian vegetation within the riparian forest and riparian scrub revegetation areas; (4) the use of plantings and seed of native species known to occur on-site; (5) the use of temporary irrigation to aid plant establishment; and (6) a financial commitment to ensure the long-term management of the revegetated areas.

The proposed erosion control is anticipated to be successful because the areas proposed for temporary reclamation will be relatively flat, thereby retaining seed and providing a suitable growth medium for seed establishment. A combination of native species in the applied seed mix, as well as non-native annual grasses, will be acceptable cover in the erosion control areas.

5.2 FINANCIAL ASSURANCES

A revegetation agreement shall be signed and notarized by the property owner following the approval of this Revegetation Plan and be accompanied by the required security as agreed upon by the County.

5.3 SCHEDULE

Plant and seed orders should be placed at least six months prior to targeted installation because some species may need to be specially collected and/or grown for the project. Topsoil salvage should occur prior to extraction activities within each mining subphase area. Revegetation activities will be initiated for each subphase immediately following the completion of mining activities in that area, as detailed above in Tables 5 and 6. Reclamation grading of the revegetation area and topsoil application using heavy equipment will follow the bird breeding season timing restrictions outlined in more detail further below. Irrigation (as applicable), plantings, and seed will be installed after final grades have been established.

Maintenance of the revegetation area will begin following the completion of installation and continue for five years within each individual subphase, or until final performance standards have been met for the respective subphase. Monitoring and coordination will begin during topsoil salvage, and continue during site preparation, revegetation installation, and through the five years after revegetation has been installed, or until final performance standards have been met. Maintenance and monitoring of the erosion control areas shall begin following hydroseed application, and continue for two years, or until performance standards established for these areas have been met.

5.4 REVEGETATION AREA PREPARATION

5.4.1 Protective Fencing

As part of the project design, temporary fencing will be installed around the perimeter of the project site where fencing is currently not present or in need of repair. In addition, during mining, temporary environmental fencing shall be installed around active work areas to protect sensitive biological resources, such as the Sweetwater River and native vegetation communities. All construction-related fencing would be removed within an area that is being actively revegetated. No temporary fencing is proposed to be installed along the boundaries of the wetland and riparian forest and riparian scrub revegetation areas since it would be located within the expanded Sweetwater River floodplain and is expected to periodically flood.

5.4.2 Topsoil Salvage

Prior to mining a subphase, the top two inches of soil will be scraped off and removed from the site to reduce the existing weed seed bank. The next 6 to 12 inches of soil, as determined by the Restoration Specialist during salvage operations, would then be collected and stored on-site in windrows that are no more than three feet in height in an area that had been prepared for topsoil storage by clearing all vegetation and scraping away the top two inches. Stored topsoil should not be disturbed until it is installed in the revegetation area. Salvaged topsoil will be applied to the native revegetation as directed by the Restoration Specialist.

5.4.3 Weed Control

Weed control shall be implemented during mining operations as directed in the project's Reclamation Plan (EnviroMINE 2025). Periodic monitoring through visual observations shall be conducted to identify and monitor non-native and invasive plant species populations within the project site. Weed control shall be implemented, if determined to be necessary, to control invasive weed species within the site. Non-native vegetation will be removed by hand or through the use of the wetland-approved herbicide.

5.4.4 Reclamation Grading and Salvaged Topsoil Application

Grading the revegetation area shall be completed as part of site reclamation immediately following the completion of mining operations within each subphase. Grading would include the establishment of all final slopes and topographic features and incorporation of accumulated wash fines, fill soils where necessary, and salvaged topsoil. Material that has been imported to fill the excavation areas in Phases 2b and 2c and Phases 3a to 3c will meet the specifications provided by the Restoration Specialist to ensure that appropriate soils and texture are used for the target vegetation types. The existing low-flow Sweetwater River channel would be retained in place to convey controlled releases and water transfers from Loveland Reservoir (located upstream of the site) to Sweetwater Reservoir (located downstream of the site), as operated by the Sweetwater Authority. The riparian forest and riparian scrub revegetation areas will be graded in accordance with the grading sheets of the Final Revegetation Plans. The banks of the low-flow river channel would be a minimum of 3.5 feet in height and will slope down the expanded floodplain. The elevations of the expanded floodplain would be similar to or slightly higher than the bottom of the low-flow river channel. Graded areas within the expanded Sweetwater River floodplain would be left in a rough grade state with micro topographic relief that mimics natural topography. Salvaged topsoil will be applied to all revegetation areas, including upland slopes, under the direction of

the Restoration Specialist. Planting and irrigation should not be installed until the Restoration Specialist has approved the grading.

Rip rap energy dissipation structures are proposed as part of the reclamation (Figures 9 and 10a through 10e). The purpose of the rip rap energy dissipation structures would be to dissipate stream flow energy, protect downstream areas from erosion, and protect existing infrastructure (i.e., Steele Canyon Road bridge and SDG&E transmission towers and powerlines). A rock drop structure is proposed to be installed downstream (west) of the Steele Canyon Road bridge within the widened Sweetwater River channel perpendicular to stream flows. Rock rip rap would be installed in two areas along the cut fill slopes: along the eastern slope of the widened channel where the Sweetwater River enters the project site, and along the southern slope to the east of Steele Canyon Road at the confluence of Mexican Canyon Creek and Sweetwater River.

Reclamation grading and installation of salvaged topsoil will occur outside of the general bird nesting season (February 15 to August 31), coastal California gnatcatcher nesting season (March 1 to August 15), and least Bell's vireo nesting season (March 15 to September 15) to avoid impacts to nesting birds. If grading and reclamation activities must occur during one of these bird breeding seasons, the relevant mitigation measures contained in the project's BTR (HELIX 2025b), such as pre-construction surveys, shall be implemented.

5.4.5 Initial Weed Control

The native habitat revegetation areas and erosion control areas will have been recently graded following mining and reclamation activities and are not expected to require any initial weed control.

5.4.6 Soil Amendments

No soil amendments are recommended for the native riparian habitat revegetation areas due to the proximity of healthy native riparian habitat and soils mapping, indicating that soils in this area consist of Riverwash and Tujunga sand (Figure 6; NRCS 2022), both appropriate for riparian forest and riparian scrub habitat. Soil amendments are likewise not expected for the DCSS habitat area due to the use of salvaged topsoil. Lastly, soil amendments will not be used in erosion control areas since they are not needed to fulfill the primary purpose of stabilization of disturbed areas.

5.4.7 Erosion Control

Erosion control BMP measures will be installed upstream of active revegetation areas wherever deemed necessary to prevent sediment movement from nearby mining. Potential erosion control measures may include, but are not limited to, windrows of cut vegetation, organic matting, fiber rolls (straw wattles), and silt fencing. Any installed erosion control materials will be removed from the revegetation areas once sufficient native plant cover is established. In addition, both in the DCSS revegetation areas, as well as in the erosion control areas located on the graded pads outside of the widened floodplain, a hydro-slurry containing tackifier and wood fiber/mulch will be applied with the seed mixture to help provide erosion control.

5.5 PLANTING PLAN

5.5.1 Native Habitat Revegetation

Planting Palettes/Seed Mixes

After site preparation and irrigation installation have been completed within each reclaimed subphase, native plantings and/or seed will be installed within the riparian forest (Table 7, *Riparian Forest Plant Palette*), riparian scrub (Table 8, *Riparian Scrub Plant Palette*), emergent wetland (Table 9, *Streambed (Emergent Wetland) Plant Palette*), and upland (Table 10, *Diego Coastal Sage Scrub Plant Palette*) revegetation areas. Plantings will be irrigated with well water. The existing low-flow river channel will be seeded with low-growing herbaceous wetland vegetation to facilitate channel stability while not impeding potential channel maintenance activities.

The species selected for planting and seeding within native revegetation areas have been observed within the on-site habitat or are known to occur within the surrounding area. These species grow in a variety of moisture regimes, and the plant palettes are intended to provide the flexibility for vegetation to establish based on microenvironmental variations in moisture within the riparian forest and scrub areas within the expanded floodplain. Fast-growing annual species that are quick to germinate will be included in the seed mix to provide initial cover and help protect against soil erosion. Slower-growing perennials will provide long-term cover and further protection against erosion.

All plants and seed should be obtained from southern San Diego County, whenever possible. Container stock orders or production from seed may be needed up to 12 months prior to the anticipated installation date. Species substitutions, quantity changes, or use of bulk-grown native seed may be allowed, if necessary, at the discretion of the Restoration Specialist. The Restoration Specialist must approve all seed and container stock orders, including source locations, prior to ordering.

Whenever possible, plant and seed installation shall be conducted during the wet season, between November 1 and February 15, although irrigation may extend these dates. All efforts will be made to plant and seed during this timeframe since beneficial temperatures and rainfall will aid in germination, establishment, and growth of target species. Hydroseeding should be conducted early in the day, when winds are relatively calm.

Table 7
RIPARIAN FOREST PLANT PALETTE[1] (14.09 acres)

CONTAINER STOCK[2]				
Scientific Name	**Common Name**	**Spacing on Center (ft.)**	**Grouping Size**	**Number Per Acre**
Artemisia dracunculus	tarragon	5	5	100
Baccharis salicifolia	mule fat	6	10	200
Distichlis spicata	saltgrass	10	3	150
Iva hayesiana	San Diego marsh elder	5	5	120
Platanus racemosa	western sycamore	15	3	50
Populus fremontii ssp. *fremontii*	western cottonwood	15	3	50
Quercus agrifolia	California live oak	15	3	50
Rosa californica	California wild rose	5	3	100
Salix exigua	sand bar willow	8	5	120
Salix gooddingii	black willow	12	5	150
Salix laevigata	red willow	12	5	180
Salix lasiolepis	arroyo willow	12	5	180
Sambucus nigra	blue elderberry	10	3	50
			Total	**1,500**

SEED MIXTURE[2]			
Scientific Name	**Common Name**	**%Purity/ Germination**	**Pounds per Acre**
Ambrosia psilostachya	western ragweed	45/45	4
Anemopsis californica	yerba mansa	55/80	1
Artemisia douglasiana	Douglas' sagewort	15/40	3
Artemisia palmeri	Palmer's sagebrush	20/50	2
Baccharis salicifolia	mule fat	10/20	3
Baccharis sarothroides	broom baccharis	7/42	1
Bolboschoenus maritimus	alkali bulrush	90/60	1
Eleocharis macrostachys	pale spike-rush	95/60	1
Juncus acutus ssp. *leopoldii*	southwestern spiny rush	95/80	1
Juncus effusus var. *pacificus*	Pacific rush	95/60	0.5
Oenothera elata ssp. *hookeri*	evening primrose	98/84	0.5
Pluchea odorata	salt marsh fleabane	30/40	2
		Total	**20.0***

[1] The quantity of seed ordered for each phase/subphase will be determined based on the exact size of the area disturbed as part of mining activities.

[2] Substitutions require approval of the Restoration Specialist.

* No less than 20 lbs. per acre of seed shall be installed.

Table 8
RIPARIAN SCRUB PLANT PALETTE[1] (84.84 acres)

	CONTAINER STOCK[2]			
Scientific Name	**Common Name**	**Spacing on Center (ft.)**	**Grouping Size**	**Number Per Acre**
Ambrosia pumila [3,4]	San Diego ambrosia	5	5	25
Artemisia dracunculus	tarragon	5	5	200
Asclepias fascicularis	narrow leaf milkweed	5	3	50
Baccharis salicifolia	mule fat	6	10	220
Croton californicus	California croton	5	5	200
Distichlis spicata	saltgrass	10	3	200
Ericameria palmeri var. *palmeri* [4]	Palmer's goldenbush	5	5	50
Iva hayesiana	San Diego marsh elder	5	5	200
Platanus racemosa	western sycamore	15	3	30
Populus fremontii ssp. *fremontii*	western cottonwood	15	3	30
Rosa californica	California wild rose	5	3	50
Salix exigua	sand bar willow	8	5	180
Salix gooddingii	black willow	12	5	100
Salix laevigata	red willow	12	5	30
Salix lasiolepis	arroyo willow	12	5	30
Sambucus nigra	blue elderberry	10	3	100
			Total	**1,695**

SEED MIXTURE[2]			
Scientific Name	**Common Name**	**%Purity/ Germination**	**Pounds per Acre**
Ambrosia psilostachya	western ragweed	45/45	4
Artemisia douglasiana	Douglas' sagewort	15/40	3
Artemisia palmeri	Palmer's sagebrush	20/50	2
Baccharis salicifolia	mule fat	10/20	3
Baccharis sarothroides	broom baccharis	7/42	1
Bolboschoenus maritimus	alkali bulrush	90/60	1
Croton californicus	California croton	90/40	1
Eleocharis macrostachys	pale spike-rush	95/60	1
Isocoma menziesii	goldenbush	18/40	1
Juncus acutus ssp. *leopoldii*	southwestern spiny rush	95/80	1
Juncus effusus var. *pacificus*	Pacific rush	95/60	0.5
Oenothera elata ssp. *hookeri*	evening primrose	98/84	0.5
Pluchea odorata	salt marsh fleabane	30/40	2
		Total	**21.0***

[1] The quantity of seed ordered for each phase/subphase will be determined based on the exact size of the area disturbed as part of mining activities.
[2] Substitutions require approval by the Restoration Specialist.
[3] If available at a nursery; should be installed in the higher elevation portions of this habitat (i.e., closer to the upland slopes).
[4] Special status species.
* No less than 20 lbs. per acre of seed shall be installed.

Table 9
STREAMBED (EMERGENT WETLAND) SEED MIX[1] (9.94 acres)

SEED MIXTURE[2]			
Scientific Name	**Common Name**	**%Purity/ Germination**	**Pounds per Acre**
Anemopsis californica	yerba mansa	55/80	1
Artemisia douglasiana	Douglas' sagewort	15/40	3
Bolboschoenus maritimus	alkali bulrush	90/60	1
Cyperus eragrostis	tall flatsedge	80/75	1
Eleocharis macrostachys	pale spike-rush	95/60	1
Erythranthe cardinalis (*Mimulus cardinalis*)	Cardinal monkey flower	5/64	0.5
Erythranthe guttata (*Mimulus guttatus*)	seep monkey flower	10/69	0.5
Euthamia occidentalis	western goldenrod	24/45	1
Juncus effusus var. *pacificus*	Pacific rush	95/60	0.5
Pluchea odorata	salt marsh fleabane	30/40	2
		Total	**11.5***

[1] The quantity of seed ordered for each phase/subphase will be determined based on the exact size of the area disturbed as part of mining activities.

[2] Substitutions require approval of the Restoration Specialist.

* No less than 10 lbs. per acre of seed shall be installed.

Table 10
DIEGAN COASTAL SAGE SCRUB PLANT PALETTE[1] (11.92 acres)

CONTAINER STOCK[2]				
Scientific Name	**Common Name**	**Spacing on Center**	**Grouping Size**	**Number per Acre**
Artemisia californica	California sagebrush	5	25	250
Asclepias fascicularis	narrow leaf milkweed	5	3	50
Bebbia juncea	rough sweetbush	10	3	50
Encelia californica	coast sunflower	5	20	100
Eriogonum fasciculatum	flat top buckwheat	5	25	250
Hazardia squarrosa	saw-toothed goldenbush	5	10	100
Hesperoyucca whipplei	chaparral yucca	3	3	50
Heteromeles arbutifolia	toyon	10	3	150
Mimulus aurantiacus	bush monkey flower	5	10	100
Rhus integrifolia	lemonadeberry	10	5	50
Salvia apiana	white sage	5	10	250
			TOTAL	**1,400**

SEED MIX[2]			
Scientific Name	**Common Name**	**Percent Purity/ Germination**	**Pounds Per Acre**
Acmispon glaber	deerweed	95/80	0.5
Amsinckia intermedia	common fiddleneck	45/65	1
Artemisia californica	California sagebrush	30/60	4
Deinandra fasciculata	fascicled tarplant	25/65	3
Encelia californica	California encelia	30/45	2
Ericameria palmeri var. *palmeri*	Palmer's goldenbush	N/A	2
Eriogonum fasciculatum	flat top buckwheat	50/20	7
Eriophyllum confertiflorum	golden-yarrow	N/A	2
Eschscholzia californica	California poppy	98/80	2
Lupinus bicolor	miniature lupine	98/85	1
Phacelia parryi	Parry's phacelia	95/80	1
Salvia apiana	white sage	88/30	3
Stipa lepida, deawned	foothill needlegrass	90/71	3
Stipa pulchra, deawned	purple needlegrass	90/75	3
		TOTAL	**34.5***

[1] The quantity of seed ordered for each phase/subphase will be determined based on the exact size of the area disturbed as part of mining activities.
[2] Substitutions require approval of the Restoration Specialist.
* No less than 30 lbs. per acre of seed shall be installed.

Container Plantings

Container plantings will be installed in irrigated revegetation areas, including riparian forest, riparian scrub, and DCSS areas. Container stock should be one-gallon size, rooted appropriately (i.e., neither root bound nor insufficiently developed), and should be installed in holes that are the same size as the planting container and backfilled afterward. Holes will be dug with mechanical augers where possible and by hand elsewhere. Plants should be installed in a way that mimics natural plant distribution; therefore, container plantings will be installed in groupings proportional to their density per acre. Upland planting holes should be filled with water twice before plantings are installed and then watered in after planting.

The Restoration Specialist must inspect all plant material prior to installation; root-bound material, any material with Argentine ants or other pests, and any other plants deemed damaged will not be accepted. They must be able to specifically identify Kuroshio shot-hole borer, gold-spotted oak borer, and thousand-canker fungus. Any diseased plants will be rejected and returned to the seller.

Cuttings

Cuttings of riparian trees or shrubs may be used in the riparian forest and riparian scrub revegetation areas. Any cuttings would be in addition to the container plantings and seed specified in Table 7 and Table 8. If feasible, cuttings should be collected from within the existing riparian corridor or the same watershed by personnel experienced in cutting collection and installation. Any species listed for planting can also be readily grown from cuttings installed directly into the ground, with the exception of blue elderberry (*Sambucus nigra*) and western sycamore (*Platanus racemosa*).

Prior to taking cuttings, it is essential that all equipment being used, typically consisting of a bucket of water and wood cutters, is sterilized so no pathogen cross-contamination occurs. All collected material must be inspected by a Restoration Specialist or nursery staff trained to detect Kuroshio shot-hole borer, gold spotted oak borer, and thousand canker fungus. Any infested material that is collected must be immediately mulched to pieces small than 1 inch in size. To maintain genetic diversity within the restored areas, no more than 10 cuttings should be taken from any one plant. Ideally, cuttings should be stored in water for approximately one week to encourage root development following planting.

In general, willow (*Salix* spp.) and cottonwood (*Populus fremontii*) pole cuttings should be at least three feet long and 0.75 to 1.25 inches in diameter, with the end that will be inserted into the ground (snipped closest to the tree trunk) cut at a 45-degree angle to facilitate soil penetration and maximize surface area for root growth. Mule fat (*Baccharis salicifolia*) cuttings can be slightly smaller. Any foliage or side branches should be stripped from each cutting to minimize water translocation and allow the cutting to put its energy into root growth.

Prior to installation the Restoration Specialist must inspect all cuttings for signs of disease. They must be able to specifically identify Kuroshio shot-hole borer, gold-spotted oak borer, and thousand canker fungus. Any diseased plants will be returned to the nursery where they will be destroyed (mulched to pieces smaller than 1 inch in size.

Cuttings should be installed a few feet into the ground such that the base of the cutting is at the water table. If the cutting is not in the water table or getting surface water (e.g., from supplemental irrigation), it will quickly dry out and die. Typically, a pole cutting is installed two to three feet deep. Cuttings should be installed in groupings according to the spacing recommendations made in Tables 6 and 7. Smaller species such as mule fat can be interspersed between larger over-story plants such as willows and cottonwoods.

Seed

Within the riparian forest and riparian scrub revegetation areas and the existing channel streambed, seed will be dispersed by hand and/or with the use of a rotary seed applicator and raked into the soil.

The DCSS revegetation areas and the 97.90-acre erosion control areas will be hydroseeded with a tackifier to add ground stabilization. The hydroseed mixture shall consist of the following materials:

- 2,000 lbs./acre cellulose fiber
- 140 lbs./acre "M" Binder (tackifier)
- 200 lbs./acre Milogranite (fertilizer if required)
- Seed mix as listed (Table 10).

5.5.2 Erosion Control Areas

After site preparation and irrigation installation have been completed within each reclaimed subphase, an erosion control seed mix (Table 11, *Erosion Control Seed Mix*) will be applied to the graded pads located outside of the widened Sweetwater River floodplain (Figures 10a through 10e).

The species selected for seeding within erosion control areas have been observed within the on-site habitat or are native to southern California. These species grow in upland or transitional wetland/upland habitats. One of the species selected is an herbaceous perennial (western ragweed [*Ambrosia psilostachya*]), while the other three species are native annuals. All four species are only expected to provide cover during winter/spring months, and only in years with sufficient rainfall to allow for establishment from seed. These are the times of year and conditions when erosion is most likely to occur.

All seed should be obtained from southern San Diego County, whenever possible. Seed orders should be placed up to 12 months prior to the anticipated installation date to allow for sufficient seed production. Species substitutions, quantity changes, or use of bulk-grown native seed may be allowed, if necessary, at the discretion of the Restoration Specialist. The Restoration Specialist must approve all seed and container stock orders, including source locations, prior to ordering.

Table 11
EROSION CONTROL SEED MIX[1,2] (97.90 acres)

Scientific Name	Common Name	Percent Purity/ Germination	Pounds Per Acre
Ambrosia psilostachya	western ragweed	45/45	6
Bromus carinatus	California bromegrass	95/90	8
Plantago insularis	plantain	98/75	20
Vulpia microstachys	small fescue	90/80	20
		TOTAL	**54***

[1] The quantity of seed ordered for each phase/subphase will be determined based on the exact size of the area disturbed as part of mining activities.
[2] Substitutions require approval of the Restoration Specialist.
* No less than 50 lbs. per acre of seed shall be installed.

5.6 IRRIGATION PLAN

Temporary, above-ground irrigation lines will be installed in the riparian forest, riparian scrub, and DCSS native habitat revegetation areas, which will be temporarily irrigated with well water, if accessible; otherwise, other irrigation connections will need to be established. The project landscape architect, together with the Installation Contractor, will inspect the irrigation system as well as coverage prior to plant/seed installation. Irrigation will not be installed on the graded pads located outside of the

expanded Sweetwater River floodplain and bordering slopes (i.e., the erosion control areas) or within the existing low-flow river channel.

Irrigation plan sheets included with the Final Revegetation Plans will show the Point of Connection (POC), available pressure, controller location, valves, piping, and head locations. If the POC is beyond the limits of the native habitat revegetation areas, the off-site irrigation service line to the POC will be identified. Irrigation plans will provide the required backflow protection at the POC and identify the power source for the irrigation controller, if applicable.

6.0 MAINTENANCE PLAN

6.1 MAINTENANCE ACTIVITIES

6.1.1 Native Habitat Revegetation

A five-year maintenance program, which will be initiated immediately following revegetation installation, is proposed to ensure the successful establishment and persistence of riparian forest/riparian scrub and DCSS habitat within the revegetated portions of the project site. The five-year period will start separately for each sub-phase as revegetation/erosion control reclamation is completed in that area. The maintenance program will involve the removal of non-native vegetation and trash, irrigation maintenance, and any remedial measures deemed necessary for the success of the revegetation program (e.g., re-seeding and/or re-planting). Maintenance activities will be directed by the Restoration Specialist and implemented by the Maintenance Contractor.

The maintenance guidelines for the native habitat revegetation areas are tailored for native plant establishment. Maintenance personnel will be informed of the goals of the revegetation effort and the maintenance requirements. A professional with experience and knowledge in native habitat restoration maintenance will supervise maintenance. It is the Maintenance Contractor's responsibility to keep seeded and planted areas free of debris, to monitor irrigation function and scheduling as well as plant material condition and health, and to remove non-native vegetation. The Maintenance Contractor will also be responsible for replacing any dead or terminally stressed plants, at the direction of the Restoration Specialist. Damage to plants, irrigation systems, and other facilities occurring as a result of unusual weather or vandalism will be repaired as directed by the Restoration Specialist. The cost of such repairs will be paid for as extra work. The contractor will be responsible for damage caused by the contractor's inadequate maintenance or operation of irrigation systems, as determined by the Restoration Specialist.

Irrigation

The goal is to obtain germination and growth with the least amount of irrigation. Too much irrigation results in abnormal habitat and encourages invasion by non-native plants, leaches nutrients from the soil, and can increase erosion; therefore, water will be applied infrequently and only as needed to prevent plant mortality.

The irrigation system within the riparian forest, riparian scrub and DCSS revegetation areas will be maintained until the Restoration Specialist determines that supplemental water is no longer required. At that time, irrigation will be permanently disconnected (e.g., the mainline will be cut), but not removed.

Above-ground portions of irrigation will be removed when directed by the Restoration Specialist, or following restoration sign off by the County.

Non-native Plant Control

Particular emphasis will be placed on the proactive removal of non-native vegetation. As non-native plants become evident, they should be removed by hand or controlled with the proper herbicides (if approved by the Restoration Specialist). The Restoration Specialist will oversee non-native plant control by the Maintenance Contractor; however, maintenance personnel must be knowledgeable in distinguishing non-native species from desirable native vegetation. If maintenance personnel mistakenly remove native species, the Maintenance Contractor will be responsible for rectifying the damage, at the direction of the Restoration Specialist.

Non-native plants considered to be moderately or highly invasive by the California Invasive Plant Council (Cal-IPC 2020) shall be eradicated within the boundaries of all native habitat revegetation areas for all five years of maintenance. Examples of invasive plants observed on-site, include but are not limited to, tamarisk (*Tamarix* spp.), giant reed (*Arundo donax*), Mexican fan palm (*Washingtonia robusta*), fennel (*Foeniculum vulgare*), Italian thistle (*Carduus pycnocephalus*), stinkwort (*Dittrichia graveolens*), pampas grass (*Cortaderia selloana*), and purple fountain grass (*Pennisetum setaceum*). Additional species may be added to this list, at the discretion of the Restoration Specialist. Non-native grasses listed as moderately or highly invasive will be controlled on-site, but due to their abundance in the local area, total eradication is not considered feasible.

Pruning

No post-installation pruning is necessary unless otherwise directed by the Restoration Specialist. For example, if it is necessary to remove an obstruction from or for the repair of the irrigation system.

Trash

All trash observed within the native habitat revegetation area should be removed for the duration of maintenance work in the respective sub-phase. All trash will be properly disposed of at a licensed landfill.

Pests

Insects, vertebrate pests, and diseases will be monitored. Generally, pests will be tolerated unless they pose a significant threat to restoration success. If deemed necessary, a licensed pest control adviser will make specific pest control recommendations. All applicable federal and state laws and regulations will be closely followed. The Restoration Specialist will be consulted on any pest control matters and will specifically monitor the native habitat revegetation areas for evidence of invasive Kuroshio shot-hole borers, gold-spotted oak borer, and thousand canker fungus. If identified, diseased trees will be mulched into pieces smaller than 1 inch in size in-situ or the Restoration Specialist will evaluate any other potential methods for control to determine if they are appropriate at the revegetation area.

Fertilization

Fertilizer will not be applied in the maintenance phase, except in extraordinary circumstances and only following the written direction of the Restoration Specialist.

Special-Status Species Issues

Maintenance activities are not anticipated to include the use of heavy equipment or vehicles and as such are not anticipated to have adverse effects on sensitive species. However, mechanical line trimmers may be used if deemed necessary by the Restoration Specialist, and all maintenance activities will be carried out under the direction of the Restoration Specialist, as necessary, to avoid any impacts to sensitive species.

Remedial Installation

Areas with low seed germination and establishment of native cuttings/plantings within the riparian forest and riparian scrub revegetation areas or associated DCSS slopes will be re-seeded and/or re-planted at the direction of the Restoration Specialist. Areas seeded with the erosion control mix outside of the widened Sweetwater River channel will not be re-seeded.

6.1.2 Erosion Control Areas

A two-year maintenance program, which will be initiated immediately following hydroseed application, is proposed for the 97.90-acre erosion control areas. The two-year period will start separately for each sub-phase as erosion control reclamation is completed in that area. The maintenance program will involve the removal of non-native vegetation and trash. Maintenance activities will be directed by the Restoration Specialist and implemented by the Maintenance Contractor.

The maintenance guidelines specified for the erosion control areas are tailored for establishing target cover to stabilize soils against potential erosion. Maintenance personnel will be informed of the goals of the erosion control revegetation effort and the maintenance requirements.

Non-Native Plant Control

Particular emphasis will be placed on the proactive removal of non-native vegetation. As non-native plants become evident, they should be removed by hand or controlled with the proper herbicides (if approved by the Restoration Specialist). The Restoration Specialist will oversee non-native plant control by the Maintenance Contractor; however, maintenance personnel must be knowledgeable in distinguishing non-native species from desirable native vegetation. If maintenance personnel mistakenly remove native species, the Maintenance Contractor will be responsible for rectifying the damage, at the direction of the Restoration Specialist.

Non-native plants considered to be moderately or highly invasive by the California Invasive Plant Council (Cal-IPC 2020) shall be substantially limited within the boundaries of the erosion control revegetation areas for both years of maintenance. Non-native annual grasses listed as moderately or highly invasive will be allowed to persist in the erosion control areas.

Remedial Installation

Areas seeded with the erosion control mix outside of the widened Sweetwater River channel will not be re-seeded.

6.2 SCHEDULE

6.2.1 Native Habitat Revegetation

Maintenance Schedule

Maintenance will be performed as necessary to prevent re-seeding by non-native plants and will likely change with varying site conditions and seasons. The schedule outlined herein (Table 12, *5-Year Maintenance Schedule for Native Habitat Revegetation Areas*) serves only as a guideline, and more frequent maintenance may be required to prevent re-seeding by non-native vegetation and/or to meet interim cover limits for non-native vegetation. The Maintenance Contractor will complete maintenance requests from the Restoration Specialist within 14 days of any written request.

At a minimum, the Maintenance Contractor will be responsible for all maintenance activities during the five-year maintenance period. For the first three years, maintenance is expected to be required every month between January through June (to cover the peak establishment period of spring germinating species) and two additional times during the remainder of the year. Maintenance visits may be reduced to four per year in Years 4 and 5 if approved by the Restoration Specialist and County, and shall be timed to best control invasive species, based on weather patterns and monitoring results. The Maintenance Contractor will complete maintenance requests from the Restoration Specialist within 14 days of any written request or monitoring report.

Table 12
5-YEAR MAINTENANCE SCHEDULE FOR NATIVE HABITAT REVEGETATION AREAS[1]

Phase	Schedule
Year 1 through Year 3 January to June July to December	Total Eight Visits/Year Every Month (six Visits) Two Visits Total
Years 4 and 5	Total Four Visits/Year (Three in Spring and one in Summer)

[1] This schedule is only a guideline; maintenance will be performed as necessary and as directed by the Restoration Specialist.

Irrigation Schedule

Following the start of the maintenance period, irrigation shall be applied daily (unless directed otherwise by the Restoration Specialist) to stimulate seed germination and ensure the survival of installed plantings. Once container plantings, cuttings, and seed are established, irrigation should become less frequent and deeper (usually accomplished with several consecutive irrigation events in a 24-hour period followed by several days with no irrigation). Native plants that are infrequently irrigated may grow slower initially but will ultimately be better able to withstand natural variations in rainfall and, therefore, be more successful long-term. Irrigation will be minimized to limit runoff and will be turned off during and following natural rainfall events. In the absence of rain events, irrigation will occur at a

minimum of three times per week for the first two years to ensure plant establishment. By Year 3, irrigation shall be reduced and occur mainly during the natural rainy season (October through April), as needed to mimic an average rainy season. If the Restoration Specialist determines that there is sufficient native cover and plants are well-established, irrigation may be deactivated prior to the end of Year 3. To demonstrate that vegetation is self-sustaining, the irrigation system must be turned off for at least two years prior to the end of the five-year maintenance/monitoring period.

6.2.2 Erosion Control Areas

Within the erosion control areas, maintenance will be performed as necessary to prevent re-seeding by non-native plants and will likely change with varying site conditions and seasons. The schedule outlined herein (Table 13, *2-Year Maintenance Schedule for Erosion Control Areas*) serves only as a guideline, and more frequent maintenance may be required to prevent re-seeding by non-native vegetation and/or to meet interim cover limits for non-native vegetation. The Maintenance Contractor will complete maintenance requests from the Restoration Specialist within 14 days of any written request.

At a minimum, the Maintenance Contractor will be responsible for all maintenance activities during the five-year maintenance period. For the first three years, maintenance is expected to be required every month between January through June (to cover the peak establishment period of spring germinating species) and two additional times during the remainder of the year. Maintenance visits may be reduced to four per year in Years 4 and 5 if approved by the Restoration Specialist and County, and shall be timed to best control invasive species, based on weather patterns and monitoring results. The Maintenance Contractor will complete maintenance requests from the Restoration Specialist within 14 days of any written request or monitoring report.

Table 13
2-YEAR MAINTENANCE SCHEDULE FOR EROSION CONTROL AREAS[1]

Phase	Schedule
Year 1 through Year 2	Total Eight Visits/Year
January to June	Every Month (six Visits)
July to December	Two Visits Total

[1] This schedule is only a guideline; maintenance will be performed as necessary and as directed by the Restoration Specialist.

7.0 MONITORING PLAN

7.1 PERFORMANCE STANDARDS

7.1.1 Native Habitat Revegetation

Success criteria provide specific standards to evaluate the progress of the revegetation effort. Attainment of these standards indicates that an area is progressing toward the goals and habitat functions and services specified by this plan. Success of the native habitat revegetation area will be determined by comparing planting survivorship, vegetative cover, and species richness within the native habitat revegetation area to targets that have been established based on visual observations of similar native habitat in San Diego County (Table 14, *Success Criteria Milestones for the Native Habitat*

Revegetation Areas). Success criteria shall only apply to native habitat revegetation areas; no success criteria shall be applied to the erosion control pad.

Table 14
SUCCESS CRITERIA MILESTONES FOR THE NATIVE HABITAT REVEGETATION AREAS

Criteria	Target				
	Year 1	Year 2	Year 3	Year 4	Year 5
Diegan Coastal Sage Scrub Revegetation					
Minimum planting survivorship (percent)	90	80	--	--	--
Minimum native cover (percent)	--	--	40	50	60
Minimum native species richness (number of species)	4	4	5	6	7
Maximum non-native forb cover (percent)	5	5	5	5	5
Maximum non-native annual grass cover (percent)	5	5	10	15	20
Maximum target invasive cover[1] (percent)	0	0	0	0	0
Irrigation	YES	YES	YES	NO	NO
Riparian Forest Revegetation					
Planting survivorship (percent)	90	80	--	--	--
Minimum native cover (percent)	--	--	40	50	60
Minimum native species richness (number of species)	7	6	5	5	5
Maximum non-native cover (percent)	10	10	10	10	10
Maximum target invasive cover[1] (percent)	0	0	0	0	0
Irrigation	YES	YES	YES	NO	NO
Riparian Scrub Revegetation					
Planting survivorship (percent)	90	80	--	--	--
Minimum native cover (percent)	--	--	30	35	40
Minimum native species richness (number of species)	8	7	6	6	6
Maximum non-native cover (percent)	10	10	10	10	10
Maximum target invasive cover[1] (percent)	0	0	0	0	0
Irrigation	YES	YES	YES	NO	NO
Streambed (Emergent Wetland) Seeding[2]					
Maximum non-native forb cover (percent)	5	5	5	5	5
Maximum target invasive cover[1] (percent)	0	0	0	0	0

[1] Seedlings of invasive species are expected to volunteer each year; however, no target invasive species should be allowed to persist, or drop seed within the native habitat revegetation areas; excludes invasive annual grasses.

[2] Sweetwater River is subjected to periodic heavy flows as a result of water releases and transfers between Loveland Reservoir and Sweetwater Reservoir, as controlled by the Sweetwater Authority. As such, vegetation along the Sweetwater River is anticipated to be dynamic and transition between sections of unvegetated streambed and vegetated streambed and no minimum native cover requirement is required.

Survivorship

Container plant survival within the riparian forest, riparian scrub, and DCSS revegetation areas should be 90 percent of the initial plantings in Year 1 and 80 percent in Year 2 (Table 14). If these targets are not met, dead plants should be replaced unless their function has been replaced by natural recruitment.

Native Cover

Cover by native vegetation within the riparian forest and shrub habitat revegetation area should increase over time and ultimately approach that of the similar native habitat that occurs on-site and within adjacent areas. By the end of the five years, native cover in the riparian forest revegetation areas

and on the DCSS slopes should be at least 60 percent, while native cover in the relatively dry but periodically scoured riparian scrub revegetation area should be at least 40 percent (Table 14). No native cover criterion has been established for the low-flow Sweetwater River channel (i.e., streambed/emergent wetland) as the river is subjected to periodic heavy flows as a result of water releases and transfers between Loveland Reservoir and Sweetwater Reservoir, as controlled by the Sweetwater Authority. As such, vegetation along the Sweetwater River is anticipated to be dynamic and transition between sections of the unvegetated streambed and vegetated streambed. If native cover during Years 1 and 2 does not appear to be on track toward attaining Year 3 targets, additional measures, such as supplemental plant and seed installation, irrigation adjustments, or increased weed control, may be implemented, per the direction of the Restoration Specialist.

Native Species Richness

Species richness is the number of native species present in a given area. During the annual monitoring, species richness within the native habitat revegetation area will be determined by visual assessment only in Years 1 and 2 and within the belt and point intercept transects in Years 3 through 5. Annual success criteria for species richness for native species vary by year with at least seven native species present on the DCSS slopes, five species in riparian forest revegetation areas, and six native species present in the riparian scrub revegetation areas at the end of Year 5 (Table 14). If the species richness goal for a given year is not met, corrective measures (e.g., reseeding, planting, etc.), will be taken to ensure the eventual achievement of the five-year goal.

Non-Native Cover

Non-native cover is typically a problem with habitat restoration, particularly at the outset of a restoration effort. However, as the revegetation effort takes hold, and with diligent maintenance efforts, non-native cover should decrease to an acceptable level. Given the maintenance schedule for the site, non-native cover (including invasive annual grasses) within the existing low-flow Sweetwater River channel and riparian forest and riparian scrub revegetation areas should not exceed 10 percent for all five years of the revegetation effort (Table 14). On DCSS slopes, non-native annual grasses are expected to slightly increase over time within a native shrub understory, up to a maximum of 20 percent cover. Cover by non-native forbs, however, should be kept to no more than five percent throughout the five-year maintenance effort (Table 14). If non-native cover limits are exceeded, additional weed control (either frequency or thoroughness) may be recommended by the Restoration Specialist.

Target Invasive Cover

Target invasive non-native plants ranked as moderately or highly invasive by the Cal-IPC (2020) should be completely eradicated from the native habitat revegetation area each year. New seedlings of invasive plants are expected since these species occur in surrounding open space; however, no target invasive species shall be allowed to persist, or drop seed, within the low-flow Sweetwater River channel, riparian forest, riparian scrub, or DCSS revegetation areas. Annual grasses listed as highly or moderately invasive do not need to be eradicated, rather they are included within the non-native annual grass cover success criterion (Table 14). Perennial invasive grasses, such as Bermuda grass, should be counted as invasive species and be targeted for eradication. If target invasive cover limits are exceeded, additional weed control (either frequency or thoroughness) may be recommended by the Restoration Specialist.

Irrigation

To provide evidence that native vegetation is self-sufficient, irrigation of the native habitat revegetation area must be shut off at least two years prior to the end of the maintenance/monitoring period.

Palmer's Goldenbush

In addition to native revegetation performance standards, a total of 234 individuals of Palmer's goldenbush shall successfully be established. This performance standard may be achieved in any phases/subphases of revegetation during the 5 years of monitoring. The number of Palmer's goldenbush individuals present within the active revegetation area(s) shall be counted in late summer (August/September) during the riparian forest and riparian scrub annual monitoring event until all individuals are counted or the target number of individuals is met.

7.1.2 Erosion Control Areas

Within the erosion control areas, success criteria provide standards to evaluate whether sufficient cover from acceptable vegetation has established to provide protection against erosion (Table 15, *Success Criteria Milestones for the Erosion Control Areas*). The goal is to have at least 40 percent cover by all acceptable vegetation (native and non-native) at the time of the Year 2 annual assessment, with at least 4 native species present, and no more than 5 percent cover by non-native forbs and 1 percent cover by invasive vegetation (other than annual grasses). Non-native annual grasses are acceptable cover within the erosion control areas and there is no specific requirement for native cover.

Table 15
SUCCESS CRITERIA MILESTONES FOR THE EROSION CONTROL AREAS

Criteria	Target	
	Year 1	Year 2
Minimum vegetation cover (percent) [1]	25	40
Minimum native species richness (number of species)	4	4
Maximum non-native forb cover (percent)	5	5
Maximum target invasive cover[2] (percent)	1	1
Irrigation	N/A	N/A

[1] Includes non-native and invasive annual grasses.
[2] Seedlings of invasive species are expected to volunteer each year; however, few target invasive species should be allowed to persist, or drop seed within the native habitat revegetation areas; excludes invasive annual grasses.

Vegetation Cover

Within the erosion control areas cover by native vegetation and non-native annual grasses should be sufficient to provide protection against seasonal erosion from rainfall. Given that the areas targeted for erosion control will be relatively flat, relatively low cover is needed for erosion control. Cover targets can only be attained in years with sufficient rainfall to enable plant establishment from seed.

Non-Native Cover

Given the maintenance schedule for the site, cover by non-native forbs should not exceed 5 percent for both years of the revegetation effort (Table 15). If non-native cover limits are exceeded, additional weed control (either frequency or thoroughness) may be recommended by the Restoration Specialist.

Target Invasive Cover

Target invasive non-native plants ranked as moderately or highly invasive by the Cal-IPC (2020) should be nearly eradicated from the erosion control areas each year. New seedlings of invasive plants are expected since these species occur in the surrounding open space; however, very few target invasive species shall be allowed to persist or drop seed. Annual grasses listed as highly or moderately invasive do not need to be eradicated. Since their roots bind soils and protect against erosion, they can be left on site and are included as part of the vegetation cover target (Table 15). Perennial invasive grasses, such as Bermuda grass, should be counted as invasive species and be targeted for eradication. If target invasive cover limits are exceeded, additional weed control (either frequency or thoroughness) may be recommended by the Restoration Specialist.

7.2 TARGET FUNCTIONS AND VALUES

Upon meeting success criteria, the native habitat revegetation area will have a net functional lift in habitat values over the existing condition by providing higher quality foraging and breeding habitat as well as greater vegetative cover and microhabitat features.

7.3 TARGET ACREAGES

The native habitat revegetation area target acreages addressed in this plan include revegetation of 11.99 acres of DCSS, 99.59 acres of riparian forest and riparian scrub habitat, and 9.92 acres of streambed (i.e., Sweetwater River) over five years. In addition, a total of 234 Palmer's goldenbush individuals shall be established.

7.4 MONITORING METHODS

Monitoring will be carried out by the Restoration Specialist, beginning with plant/seed orders as well as all site preparation and habitat installation and continuing through final sign-off of the revegetation areas, approximately five years after initial installation activities are completed. Monitoring of the native habitat revegetation area will include: (1) site preparation/installation monitoring, (2) maintenance monitoring, and (3) annual technical monitoring. The erosion control areas will be monitored on the same schedule and in the same manner as the native habitat revegetation areas through the end of Year 2. The methods for the annual technical monitoring are provided below. During each visit, the Restoration Specialist will inspect the site to ensure that the revegetation effort is progressing as planned and identify any problems that may affect the effort.

7.4.1 Site Preparation/Installation Monitoring

The Restoration Specialist will coordinate with the Installation Contractor regarding all plant and seed orders/contract growing. In addition, they will coordinate with the Installation Contractor to help direct the harvest of native cuttings, as needed. The Restoration Specialist will be on-site regularly during

grading of the final landforms and application of salvaged topsoil, and installation of erosion control measures, irrigation, and plantings/seed to ensure that activities are being conducted per this plan. The Restoration Specialist must inspect and authorize each phase of work before the next phase may begin. The monitoring schedule is outlined in Table 16, *Maintenance Monitoring Schedule*; additional monitoring may be needed if there are problems with the Installation Contractor's performance or unexpected difficulties with site preparation.

Table 16
MAINTENANCE MONITORING SCHEDULE[1]

Phase	Schedule
Site Preparation/Installation Monitoring	
Site preparation and installation	Daily, or as needed
Maintenance Monitoring	
Year 1 through Year 3 November to April May to October	8 visits Monthly June and August
Years 4 and 5	4 visits
Annual Technical Monitoring	
Once per year	Upland: April/May Wetland: August/September

[1] This schedule is the minimum monitoring frequency; additional monitoring may be required if there are problems with Installation or Maintenance Contractor performance, unexpected difficulties with site preparation, or issues with habitat establishment.

Prior to the start of mining, and again prior to the start of installation for each subphase, the Restoration Specialist will document existing site conditions by taking photographs and noting any special conditions within the proposed native habitat revegetation area. To document the progress of the revegetation effort, the Restoration Specialist will identify at least four photographic documentation locations in each sub-phase area, though additional locations may be established, depending on the exact size of the subphase area. Photo stations will be mapped with a sub-meter accuracy global positioning system (GPS) and plotted on a map. These photos will be used for future comparison with post-installation and annual assessment photos.

7.4.2 Maintenance Monitoring

Maintenance monitoring of the native habitat revegetation area will consist of general site inspections focused on visual observations of native plant establishment and growth and other site conditions (e.g., presence of non-native plants, signs of plant diseases, erosion, etc.), and will document all wildlife observed during each site visit for inclusion in the annual report. Following the installation of irrigation and plantings in the native habitat revegetation area, the Restoration Specialist will monitor and direct maintenance activities for the 5-year maintenance and monitoring period. In Years 1 through 3, visits will be conducted monthly from November through April (to cover the peak establishment and growth period for upland vegetation) and twice in the remainder of the year, for a total of eight visits per year (Table 14). During Years 4 and 5, monitoring will be conducted four times per year, with an emphasis on the spring and summer growing season. This monitoring schedule is the minimum; more frequent inspections may be necessary if there are problems with contractor performance or habitat development. Monitoring memos noting any issues with plant establishment, irrigation, sediment control, etc., will be provided as necessary to the Installation/Maintenance Contractor(s) and the project

proponent. Any diseased plants that are identified will be mulched on-site to pieces smaller than 1 inch in size.

7.4.3 Annual Technical Monitoring

The Restoration Specialist will conduct annual technical monitoring of the native habitat revegetation area each year during the five-year maintenance and monitoring period. Annual monitoring will occur in the spring (April/May) for the DCSS slopes, and in late summer (August/September) for the riparian forest and riparian scrub habitats. The assessments are scheduled to coincide with the peak of the growing season for the respective target habitat types. The exact timing of the visits will depend on on-site and weather conditions.

In the native habitat revegetation area, technical monitoring of both the DCSS slopes and riparian areas will include both qualitative (visual) and quantitative (based on data collection) sampling, depending on the year. In Years 1 and 2, only qualitative monitoring will be conducted, consisting of the following: (1) photo documentation; (2) visual estimates of container planting survivorship, cover by native and non-native plants, target invasive species cover, and the average height of tree and shrub species; (3) a complete list of plant and animal species observed and detected; (4) general observations of plant health; and (5) observations of site hydrology and erosion. Starting in Year 3, quantitative sampling consisting of transect sampling will be conducted. The success of the wetland mitigation effort will be evaluated by comparing the habitat development with success criteria milestones (Table 14).

In the erosion control areas, annual technical monitoring will be limited to a qualitative assessment and comparing the results of that assessment to success criteria milestones identified in Table 15.

7.4.3.1 Photo Documentation

Photos will be taken as part of all five annual monitoring events and will be included in the respective year's annual report. Photos will be taken at the same photo locations that are established prior to the start of the revegetation effort. To visually demonstrate the progress of the revegetation effort, photos taken immediately after installation of each sub-phase will be included in each report for comparison with the respective year's annual assessment photos.

7.4.3.2 General Wildlife

During each of the five annual assessments, all wildlife incidentally observed or detected will be documented. No focused wildlife surveys will be conducted.

7.4.3.3 Transect Sampling

Starting in Year 3, 50-meter (m) transects will be used to collect quantitative data within the native habitat revegetation areas. These transects will be randomly located during the Year 3 annual assessment, marked in the field with PVC pipes, and mapped onto an aerial figure using a GPS. Plant cover data will be collected along each transect using the point intercept line transect sampling methods described in the California Native Plant Society's Field Sampling Protocol (Sawyer and Keeler-Wolf 1995). Native, non-native, and invasive plant cover data will be collected by recording all of the plant species intercepted at each 0.5-m interval along the length of each transect. Vegetation will be recorded separately for herb (0 to 0.6 m), shrub (0.6 to 2 m), and tree (greater than 2 m) layers. Species richness

(the number of native species present in a given area) data will be collected by noting all species occurring along a 5-m belt transect centered on each line transect. A minimum of two 50-meter transects will be installed within both riparian forest and riparian scrub habitat in each sub-phase for a total of 40, 50-meter transects. At least one additional 50-meter transect will be sampled in each sub-phase that contains DCSS revegetation on upland slopes. Additional transects may be installed within a given sub-phase depending on the overall size of the revegetation area.

7.5 MONITORING REPORTS

7.5.1 As-Built Report

The Restoration specialist shall submit a brief as-built letter report to the County within 45 days of completion of revegetation of each individual sub-phase. The report will describe revegetation site preparation, installation methods, and the as-built status of the site. To document the implementation of the revegetation plan and baseline site conditions, the letter will include an as-built graphic on an aerial photo base as well as photos taken from the designated photo stations before and after the revegetation installation. The as-built letter will serve as the "time zero" report, noting when the five-year maintenance and monitoring period began.

7.5.2 Annual Reports

An annual report including qualitative and quantitative analysis will be prepared each year during the five-year monitoring period and submitted to the County and Wildlife Agencies. A single report will be submitted for the project site and shall clearly present the current revegetation status and monitoring results for each active individual sub-phase with active revegetation. Monitoring and maintenance field data shall be included as an addendum to each report.

Any significant issue or contingency that arises on the job site (e.g., plant survival issues, fire, or flooding) shall be reported in writing to the County within two weeks from the date of the incident. Accompanying the report shall be a plan for remediation, with an implementation schedule and a monitoring schedule.

8.0 COMPLETION OF REVEGETATION

Revegetation of the project site will be conducted in a staggered timeline as individual sub-phases are progressively reclaimed and revegetated following the completion of mining activities. As such, completion of the revegetation effort will be similarly accomplished in a staggered effort as each sub-phase is successfully revegetated. The County and Wildlife Agencies will be notified of revegetation completion within each sub-phase through the submittal of annual reports.

When sign-off is recommended for a particular project sub-phase, the County and Wildlife Agencies may inspect that area to determine the success of that revegetation effort. If an area meets all success standards, then the revegetation effort will be considered a success; if final success criteria are not met by the end of Year 5, the maintenance and monitoring program for that area may be extended until the standards are met, subject to County and Wildlife Agencies discretion. Specific remedial measures (approved by the County and Wildlife Agencies) will be used during any extension. Monitoring extensions will be done only for areas that fail to meet final success criteria. This process will continue

until all Year 5 success criteria are attained or until the County, together with the Wildlife Agencies, determines that supplemental measures are appropriate. Should the revegetation effort meet all goals prior to the end of the five-year monitoring period, the County and Wildlife Agencies, at their discretion, may terminate the monitoring effort.

9.0 CONTINGENCY MEASURES

9.1 INITIATING CONTINGENCY MEASURES

If the County or Wildlife Agencies determine upon receipt of any of the annual monitoring reports that the revegetation effort is not meeting success standards, they shall notify the project proponent in writing that the revegetation effort may require additional measures for successful implementation. The project proponent shall then have 30 days to respond to the notification. During this period, the project proponent may discuss alternatives with the County and Wildlife Agencies.

9.2 ALTERNATIVE LOCATIONS FOR CONTINGENCY COMPENSATORY MITIGATION

Sufficient area for contingency restoration is present at the project site. If the success criteria are not being met, the County and Wildlife Agencies will work together with the project proponent to reach an alternative mutually acceptable solution.

The project proponent, New West Investment, Inc., shall be responsible for all costs associated with any remedial measures.

9.3 NATURAL DISTASTER

Any significant issue or contingency that arises on the job site (e.g., plant survival issues, fire, or flooding) shall be reported in writing to the County of San Diego within two weeks from the date of the incident. Accompanying the report shall be a plan for remediation, with an implementation schedule and a monitoring schedule.

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11.0 REFERENCES

American Ornithological Society (AOS). 2022. AOU Checklist of North and Middle American Birds (online checklist; 58th Supplement) Retrieved from: http://checklist.aou.org/taxa/.

Bradley, R.D., Ammerman, L.K., Baker, R.J., Bradley, L.C., Cook, J.A., Dowler, R.D. Jones, C., Schmidly, D.J, Stangi, F.B., Van De Bussche, R.A., Wursig, B. (2014). Revised checklist of North American mammals north of Mexico. Museum of Texas Tech University Occasional Papers. 327:1-27.

Calflora. 2022. Retrieved from: http://www.calflora.org/.

California Invasive Plant Council (Cal-IPC). 2022. California Invasive Plant Inventory Database. Retrieved from: https://www.cal-ipc.org/plants/inventory/.

County of San Diego (County). 2011. San Diego County Code Title 8 Zoning and Land Use Regulations, Division 6. Miscellaneous Land Use Regulations. Chapter 6. Resource Protection Ordinance. October 14.

2010. Guidelines for Determining Significance and Report Format and Content Requirements, Biological Resources. Fourth Revision, September 15. Retrieved from: https://www.sandiegocounty.gov/content/dam/sdc/pds/ProjectPlanning/docs/Biological_Guidelines.pdf.

2007. County of San Diego Report Format and Contents Requirements Revegetation Plans. July 30. Retrieved from: https://www.sandiegocounty.gov/content/dam/sdc/dplu/docs/Revegetation_Report_Formats.pdf.

1997. Multiple Species Conservation Program, County of San Diego Subarea Plan. October 22.

Davenport, Ken. 2018. Lepidoptera of North America 15. Butterflies of southern California in 2018: updating Emmel and Emmel's 1973 Butterflies of southern California. Colorado State University. Department of Bioagricultural Sciences and Pest Management; C.P. Gillette Museum of Arthropod Diversity. April 20. Retrieved from: https://mountainscholar.org/handle/10217/187314.

EnviroMINE, Inc. 2025. Reclamation Plan for the Cottonwood Sand Mining Project (PDS2018-MUP-003, PDS2018-RP-18-001, PDS2018-ER-18-19-007), Jamacha, Ca. March.

Geocon, Inc. 2020. Soil and Geological Reconnaissance. Cottonwood Sand Mining Pit. El Cajon, California. November 4.

HELIX Environmental Planning, Inc. (HELIX) 205a. Conceptual Wetland Mitigation Plan for the Cottonwood Sand Mine Project. May.

2025b. Biological Resources Technical Report for the Cottonwood Sand Mine Project. May.

2025c. Conceptual Resources Management Plan for the Cottonwood Sand Mine Project. May.

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California, The Resources Agency, 156 pp.

Jepson Flora Project (eds.) 2022. *Jepson eFlora*. Retrieved from: http://ucjeps.berkeley.edu/eflora/.

Natural Resources Conservation Service (NRCS). 2012. National Resource Conservation Service Web Soil Survey. Retrieved from: https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

Oberbauer, T., M. Kelly, and J. Buegge. 2008. Draft Vegetation Communities of San Diego County. Based on "Preliminary Descriptions of the Terrestrial Natural Communities of California," R. F. Holland, Ph.D., October 1986. March. Revised from 1996 and 2005. July.

Pelham, Jonathon P. 2022. A Catalogue of Butterflies of the United States and Canada. University of Florida. Florida Museum of Natural History, McGuire Center for Lepidoptera and Biodiversity; University of Washington. Burke Museum of Natural History and Culture. Revised February 2. Retrieved from: https://www.butterfliesofamerica.com/US-Can-Cat.htm.

Sawyer, J.O. and T. Keeler-Wolf. 1995. A Manual of California Vegetation. CNPS. 472 pp.

Society for the Study of Amphibians and Reptiles (SSAR). 2022. North American Species Names Database. Retrieved from: https://ssarherps.org/cndb/.

Tremor, S., D. Stokes, W. Spencer, J. Diffendorfer, H. Thomas, S. Chives, and P. Unitt. 2017. San Diego Mammal Atlas. San Diego Natural History Museum.

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Attachment C.

Soil and Geologic Reconnaissance

SOIL AND GEOLOGIC RECONNAISSANCE

COTTONWOOD SAND MINING PIT
EL CAJON, CALIFORNIA

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

PREPARED FOR

HELIX
ENVIRONMENTAL PLANNING, INC.
LA MESA, CALIFORNIA

JANUARY 4, 2019
REVISED NOVEMBER 4, 2020
PROJECT NO. G2137-42-02

Project No. G2137-42-02
January 4, 2019
Revised November 4, 2020

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, California 92942

Attention: Ms. Andrea Bitterling

Subject: SOIL AND GEOLOGIC RECONNAISSANCE
COTTONWOOD SAND MINING PIT
EL CAJON, CALIFORNIA

Dear Ms. Bitterling:

In accordance with your request and our proposal (LG-17295), we have prepared this soil and geologic reconnaissance for the proposed Cottonwood Sand Mining Pit project in El Cajon, California. The accompanying report describes the site soil and geologic conditions, identifies potential geotechnical constraints; and geologic hazards pertinent to the subject property.

Should you have questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Garry W. Cannon
CEG 2201
RCE 56468

Rodney C. Mikesell
GE 2533







GWC:RCM:dmc:arm

(e-mail) Addressee

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SOIL AND GEOLOGIC RECONNAISSANCE

1. PURPOSE AND SCOPE

This report presents the results of a soil and geologic reconnaissance for the proposed Cottonwood Sand Mining Pit project, in El Cajon, California. The purpose of this study is to provide preliminary soil and geologic information for the property and to identify known, if any, geologic hazards that may adversely impact the project.

A summary of reports, maps, and other documents used preparation of this report is presented in the *References* listing at the end of this report.

2. SITE AND PROJECT DESCRIPTION

The site consists of an approximately 280-acre, irregularly shaped parcel located in the Sweetwater River Valley along Willow Glen Drive approximately between Jamacha Boulevard and Hillsdale Road in El Cajon, California (see Vicinity Map, Figure 1). The site is currently utilized as a golf course. Site elevations vary from a high of approximately 380 feet above Mean Sea Level (MSL) at the eastern end, to a low of approximately 328 feet above MSL at the western end.

We understand that the property will be utilized to mine sand for concrete and asphalt. Based on the plans prepared by Change Consultants titled Cottonwood Sand Mining Project, dated October 28, 2020, bottom mine excavations ranging from 295 feet MSL at the west end to 330 feet MSL at the east end are planned. Excavations would average approximately 20 feet below existing ground surface across the property; some areas would be excavated to a depth up to approximately 40 feet below existing ground surface. After the completion of mining, the site will be reclaimed by filing in the mine pits with overburden, wash fines and topsoil. Permanent slopes at the completion of reclamation grading up to approximately 26 feet in height at an inclination of 3:1 (horizontal to vertical) are planned.. Upon completion of mining activities, the project site would be available for uses allowed by the existing land use designations and zoning classifications (Open Space, S80; Specific Planning Area, S88; and Holding Area, S90). Future development of the site is not included in the proposed project, with planned uses including open space and recreational trails.

3. SOIL AND GEOLOGIC CONDITIONS

Based on observations during our site reconnaissance and our review of Tan (2002a), Tan (2002b), and Geocon (2017) the site is underlain by Holocene-age alluvial deposits. The alluvial deposits are divided into channel deposits and flood plain deposits. The approximate limits of the geologic units, based on CSRL (2008), are shown on Figure 2 (Geologic Map). Granitic rock underlies the alluvium. Each of the units are discussed below. There are areas of undocumented fill. The undocumented fill was not mapped.

3.1 Undocumented Fill (not mapped)

Undocumented fill was encountered in previous borings at several locations on the property (Geocon, 2017). The fill was generally found within the upper 6 feet of the ground surface. At some locations, the fill was locally deeper. The fill was generally composed of loose to medium dense, silty to clayey sand (SC) and sandy clay (CL) with trace gravel.

3.2 Alluvium: Channel Deposits (Qalc)

Quaternary age alluvial channel deposits is present generally through the central portion of the project site. The alluvium generally consists of loose, fine- to course-grained sand with varying amounts of silt and gravel.

3.3 Alluvium: Flood Plain Deposits (Qalf)

Quaternary age alluvial flood plain deposits have been mapped flanking the north and south sides of the channel deposits. The flood plain deposits generally consists of soft to firm, micaceous, sandy clay, sandy silt, and silty sand.

3.4 Granitic Rock (Kgr)

Granitic rock was encountered below the alluvium in 4 borings performed during previous drilling (see Geocon, 2017). The granitic rock encountered was weathered and excavated as silty, fine to coarse sand.

4. GROUNDWATER

During our previous investigation (Geocon, 2017) groundwater was encountered within the western approximately three-fourths of the property between elevations of 316 feet MSL and 341 feet MSL. This corresponded to depths of approximately 5 feet to 18 feet below the ground surface. Because the property is situated in a drainage area, groundwater elevation is expected to fluctuate between dry and rainy periods from year to year.

5. GEOLOGIC STRUCTURE

Contacts between stratigraphic units described above are generally flat lying.

6. GEOLOGIC HAZARDS

6.1 Ground Rupture

The USGS (2016) shows that there are no mapped Quaternary faults crossing or trending toward the property. The site is not located within a currently established Alquist-Priolo Earthquake Fault Zone.

No active faults are known to exist at the site. The nearest active fault is the Rose Canyon Fault, which lies approximately 15 miles west of the site. The risk associated with ground rupture hazard is low.

6.2 Seismicity

We performed a deterministic seismic hazard analysis using Risk Engineering (2015). Six known active faults were located within a search radius of 50 miles from the property. We used the 2008 USGS fault database, which provides several models and combinations of fault data, to evaluate the fault information. Based on this database, the Newport-Inglewood/Rose Canyon Fault Zone, located approximately 15 miles west of the site, is the nearest known active fault and is the dominant source of potential ground motion. Earthquakes that might occur on the Newport-Inglewood/Rose Canyon Fault or other faults within the southern California and northern Baja California area are potential generators of significant ground motion at the site. The estimated maximum earthquake magnitude and peak ground acceleration for the Elsinore Fault are 7.5 and 0.0.23g, respectively. The table below lists the estimated maximum earthquake magnitude and peak ground acceleration for the most dominant faults in relation to the site. We calculated peak ground acceleration (PGA) using acceleration-attenuation relationships by: Boore and Atkinson (2008); Campbell and Bozorgnia (2008); and Chiou and Youngs (2008).

TABLE 6.2.1
DETERMINISTIC SPECTRA SITE PARAMETERS

Fault Name	Distance from Site (miles)	Maximum Earthquake Magnitude (Mw)	Peak Ground Acceleration		
			Boore-Atkinson 2008 (g)	Campbell-Bozorgnia 2008 (g)	Chiou-Youngs 2008 (g)
Newport-Inglewood/Rose Canyon	14.7	7.5	0.23	0.17	0.21
Rose Canyon	14.7	6.9	0.19	0.15	0.16
Coronado Bank	25.7	7.4	0.16	0.11	0.13
Palos Verdes/Coronado Bank	25.7	7.7	0.18	0.12	0.15
Elsinore	30.6	7.85	0.17	0.11	0.14

In the event of a major earthquake on the referenced faults or other significant faults in the southern California and northern Baja California area, the site could be subjected to moderate to severe ground shaking. The risk at this site is comparable to others in the general vicinity with respect to seismic shaking hazard.

We performed a probabilistic seismic hazard analysis for the site using Risk Engineering (2015). The computer program assumes that the occurrence rate of earthquakes on each mapped Quaternary fault is proportional to the fault slip rate. The program accounts for earthquake magnitude as a function of

fault rupture length, and site acceleration estimates are made using the earthquake magnitude and distance from the site to the rupture zone. The program also accounts for uncertainty in each of following: (1) earthquake magnitude, (2) rupture length for a given magnitude, (3) location of the rupture zone, (4) maximum possible magnitude of a given earthquake, and (5) acceleration at the site from a given earthquake along each fault. By calculating the expected accelerations from considered earthquake sources, the program calculates the total average annual expected number of occurrences of site acceleration greater than a specified value. We used acceleration-attenuation relationships suggested by Boore-Atkinson (2008), Campbell-Bozorgnia (2008), and Chiou-Youngs (2008) in the analysis. Table 6.2.2 presents the site-specific probabilistic seismic hazard parameters including acceleration-attenuation relationships and the probability of exceedence.

TABLE 6.2.2
PROBABILISTIC SEISMIC HAZARD PARAMETERS

Probability of Exceedence	Peak Ground Acceleration		
	Boore-Atkinson, 2008 (g)	**Campbell-Bozorgnia, 2008 (g)**	**Chiou-Youngs, 2008 (g)**
2% in a 50 Year Period	0.41	0.35	0.40
5% in a 50 Year Period	0.31	0.26	0.29
10% in a 50 Year Period	0.24	0.21	0.21

While listing peak accelerations is useful for comparison of potential effects of fault activity in a region, other considerations are important in seismic design, including frequency and duration of motion and soil conditions underlying the site. Seismic design of the structures should be evaluated in accordance with the California Building Code (CBC) guidelines.

6.3 Liquefaction

Due to the loose subsurface soils and the near-surface groundwater, seismically induced soil liquefaction hazard could be high; however, given the nature of the proposed project as a sand mining pit, the associated risk is low.

6.4 Landslides

No evidence of landsliding was encountered at the site during the geotechnical investigation or in our review of historic, stereoscopic aerial photographs (USDA, 1953).

The risk associated with ground movement hazard due to landsliding is low.

6.5 Seiches and Tsunamis

The site is not located within a tsunami inundation zone as defined by California Geological Survey. Elevation at the site is approximately 350 feet MSL. There are no lakes or reservoirs are located near the site. The risk associated with inundation hazard due to tsunamis or seiches is low.

6.6 Flooding

The Federal Emergency Management Agency (FEMA 2012) locates the site within a Flood Zone AE area, indicating a high risk to inundation by 100-year and 500-year floods.

7. SLOPE STABILITY

A slope stability analysis was performed for the proposed permanent 3:1 (horizontal to vertical) slopes shown on the reclamation plan (Chang Consultants, 2020). We performed the analysis on the highest cut slope proposed for the project. The location of the analysis is shown on Figure 2. The analysis was performed using Geoslope (2018) distributed by Geo-Slope International. This program uses conventional slope stability equations and a two-dimensional limit-equilibrium method to calculate the factor of safety against deep-seated failure. For our analysis, Spencer's Method with a circular failure mechanism was used in the analysis. Spencer's Method satisfies both moment and force equilibrium.

Strength parameters used in the analysis were based on laboratory direct shear strength testing performed on samples taken during previous drilling (Geocon, 2017). Table 7.1 summarizes the shear strength test results. For our analysis we used the low bound curve, see Figure 3. We also utilized a groundwater elevation of 335 feet MSL based on information from the nearest borings to the slope stability section. We have also assumed fill will be replaced in the mined excavation in front of the slope toe during reclamation operations.

TABLE 7.1
SUMMARY OF LABORATORY DIRECT SHEAR TEST RESULTS
ASTM D 3080

Sample No.	Dry Density (pcf)	Moisture Content (%)		Unit Cohesion (psf)	Angle of Shear Resistance (degrees)
		Initial	Final		
B28-1	106.3	5.4	18.0	650	24
B28-4	94.1	28.7	30.4	520	24
B35-3	106.9	3.6	20.0	730	31

Graphical output of the stability analysis is shown on Figure 4. Based on our analysis, planned 3:1 cut slopes at the completion of reclamation grading have a static factor of safety greater than 1.5.

We also performed seismic slope stability analysis in accordance with *Recommended Procedures for Implementation of DMG Special Publication 117: Guidelines for Analyzing and Mitigating Landslide Hazards in California*, prepared by the Southern California Earthquake Center (SCEC), dated June 2002 and *Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California (2008)*.

The seismic slope stability analysis was performed using a ground motion of 0.25g, corresponding to a 10 percent probability of exceedance in 50 years. A modal magnitude and modal distance of 7.7 and 48 kilometers, respectively, was used in the analysis.

Using the parameters discussed above, an equivalent site acceleration, k_{EQ}, of 0.175g was calculated to perform the screening analysis. Utilizing the calculated k_{EQ} as the horizontal seismic coefficient, the stability analyses indicates factor of safeties of 1.0 or greater. A slope is considered acceptable by the screening analysis if the calculated factor of safety is greater than 1.0 using k_{EQ}; therefore, the critical slopes pass the screening analysis for seismic slope stability. Printouts of the seismic slope stability analysis are provided on Figures 5 and 6.

Based on the results of the slope stability analyses, a minimum static and pseudo-static factor of safety of 1.5 and 1.0, respectively, was achieved and the proposed permanent reclaimed slopes are considered grossly stable.

All permanent slopes should be landscaped with drought-tolerant vegetation, having variable root depths and requiring minimal landscape irrigation. In addition, all slopes should be drained and properly maintained to reduce erosion.

We also performed an analysis for temporary mined slopes. Temporary slopes are expected to be less than 40 feet in height and constructed at a 2:1 inclination. We understand that if a temporary slope is inactive for more than a 10 to 15 day period, the slope will be flattened to 3:1 or shallower. Based on our analysis, temporary slopes at an 2:1 inclination have a static factor of safety greater than 1.5. Figure 7 shows the slope stability analysis for 2:1 slopes.

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 Based on our review of published geologic maps, geotechnical reports for nearby developments, and our geologic reconnaissance, the study area is underlain by recent alluvium over weathered granitic rock.

8.2 No significant soil or geologic conditions were observed or are known to exist that would preclude the use of the site as a sand mining pit.

8.3 Proposed permanent 3:1 reclamation slopes have a factor of safety in excess of 1.5 for both static conditions and pseudo-static conditions.

8.4 The property is approximately 15 miles from the Rose Canyon Fault. It is our opinion active and potentially active faults do not extend across the site. Risks associated with seismic activity consist of the potential for strong seismic shaking and soil liquefaction.

8.5 The risk associated with ground rupture, tsunamis or seiches hazard is low.

8.6 Due to the loose subsurface soils and the near-surface groundwater, seismically induced soil liquefaction hazard is high; however, given the nature of the proposed project as a sand mining pit, the associated risk is low.

8.7 Shallow groundwater is present within the project boundaries.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

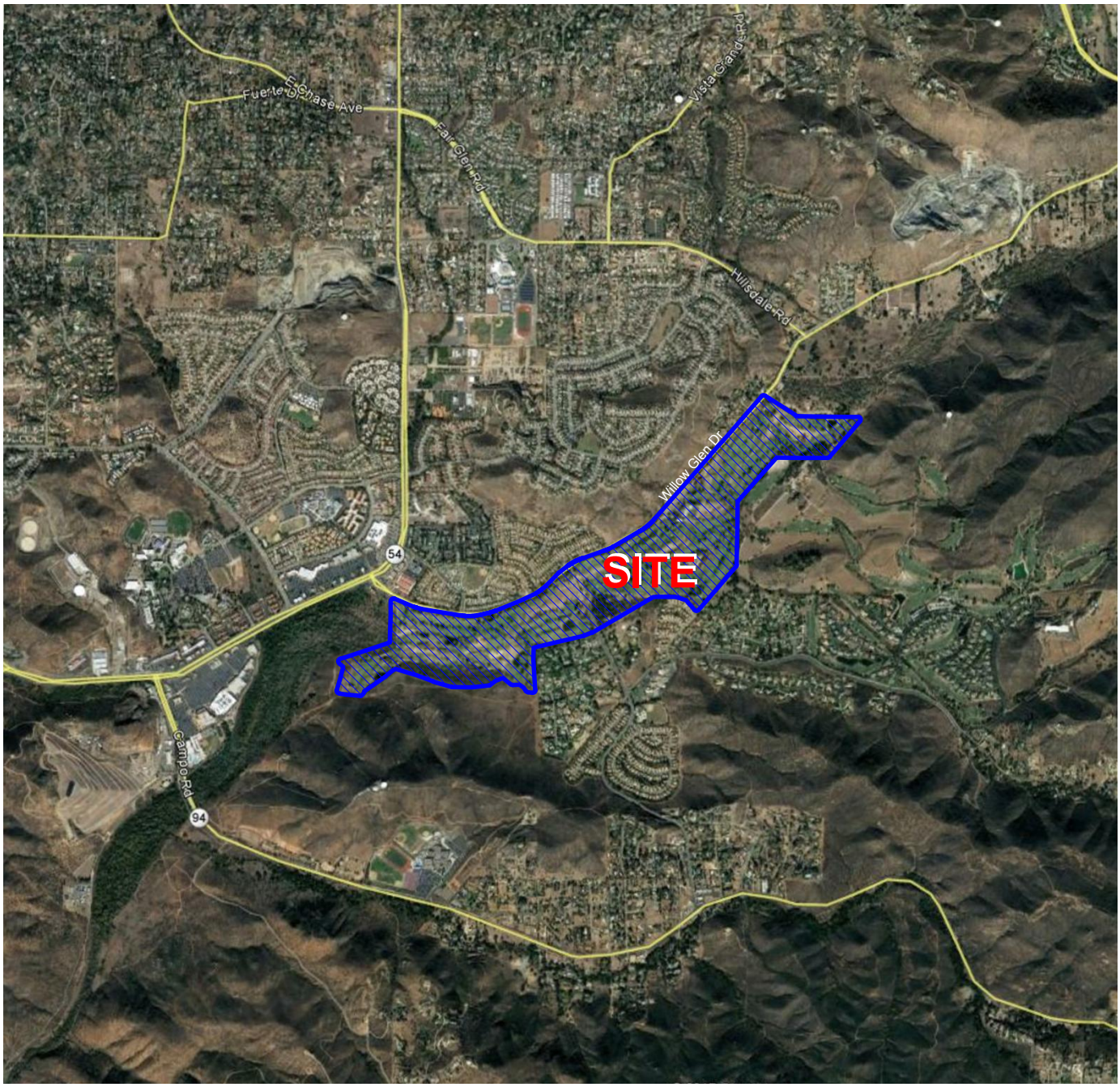
1. The conclusions and recommendations presented in this report are based on a review of available published information and performance of a site reconnaissance. In this regard, no subsurface investigation was conducted. As a consequence, the Client should recognize that this information is preliminary and our conclusions and recommendations could change significantly once a subsurface investigation is performed and the actual site conditions are identified.

2. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.

3. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon Incorporated should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon Incorporated.

4. This report is issued with the understanding that it is the responsibility of the owner or his representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

5. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.



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NO SCALE

VICINITY MAP

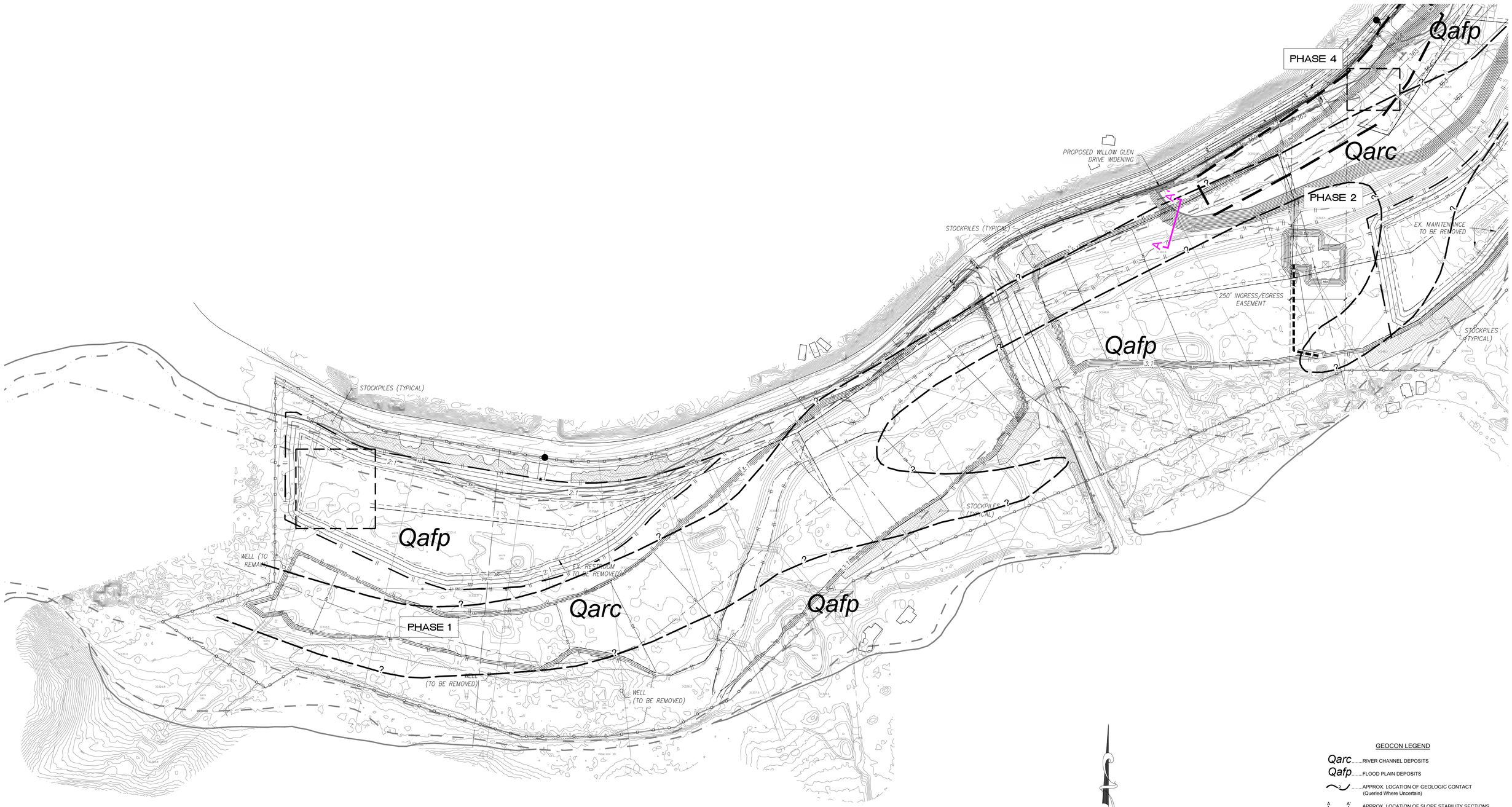
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COTTONWOOD SAND MINING
EL CAJON, CALIFORNIA

GC / CW		DSK/GTYPD

DATE 11 - 04 - 2020	PROJECT NO. G2137 - 42 - 02	FIG. 1

Plotted:11/04/2020 3:32PM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G2137-42-02 (Cottonwood Sand Mining)\DETAILS\G2137-42-02 Vic Map.dwg



GEOCON LEGEND

Qarc.....RIVER CHANNEL DEPOSITS

Qafp.....FLOOD PLAIN DEPOSITS

.....APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

A A'.....APPROX. LOCATION OF SLOPE STABILITY SECTIONS

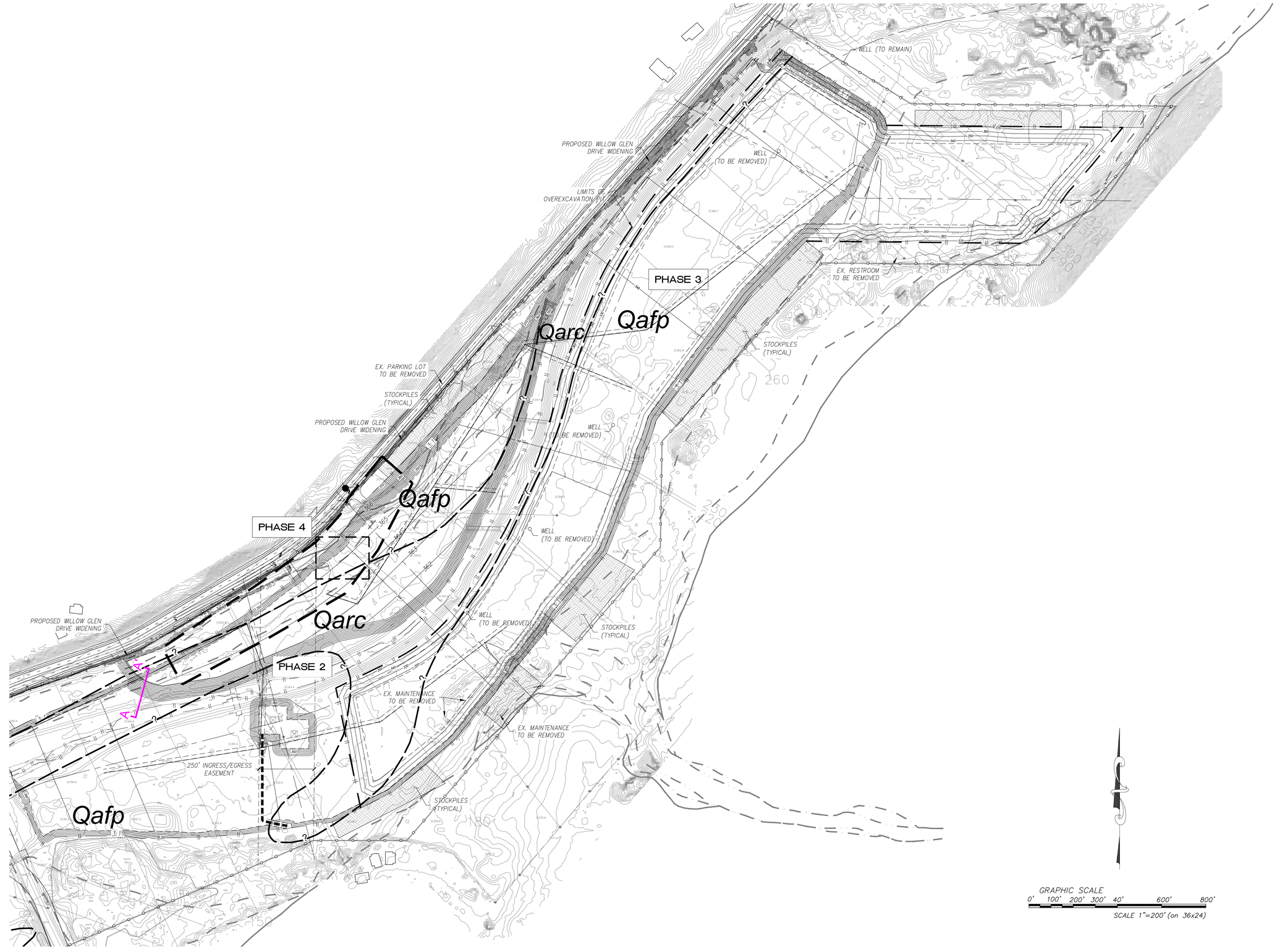
GEOLOGIC MAP

COTTONWOOD SAND MINING
EL CAJON, CALIFORNIA

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SCALE	1" = 200'	DATE	11 - 04 - 2020
PROJECT NO.	G2137 - 42 - 02	FIGURE	2A
SHEET	1 OF 2		

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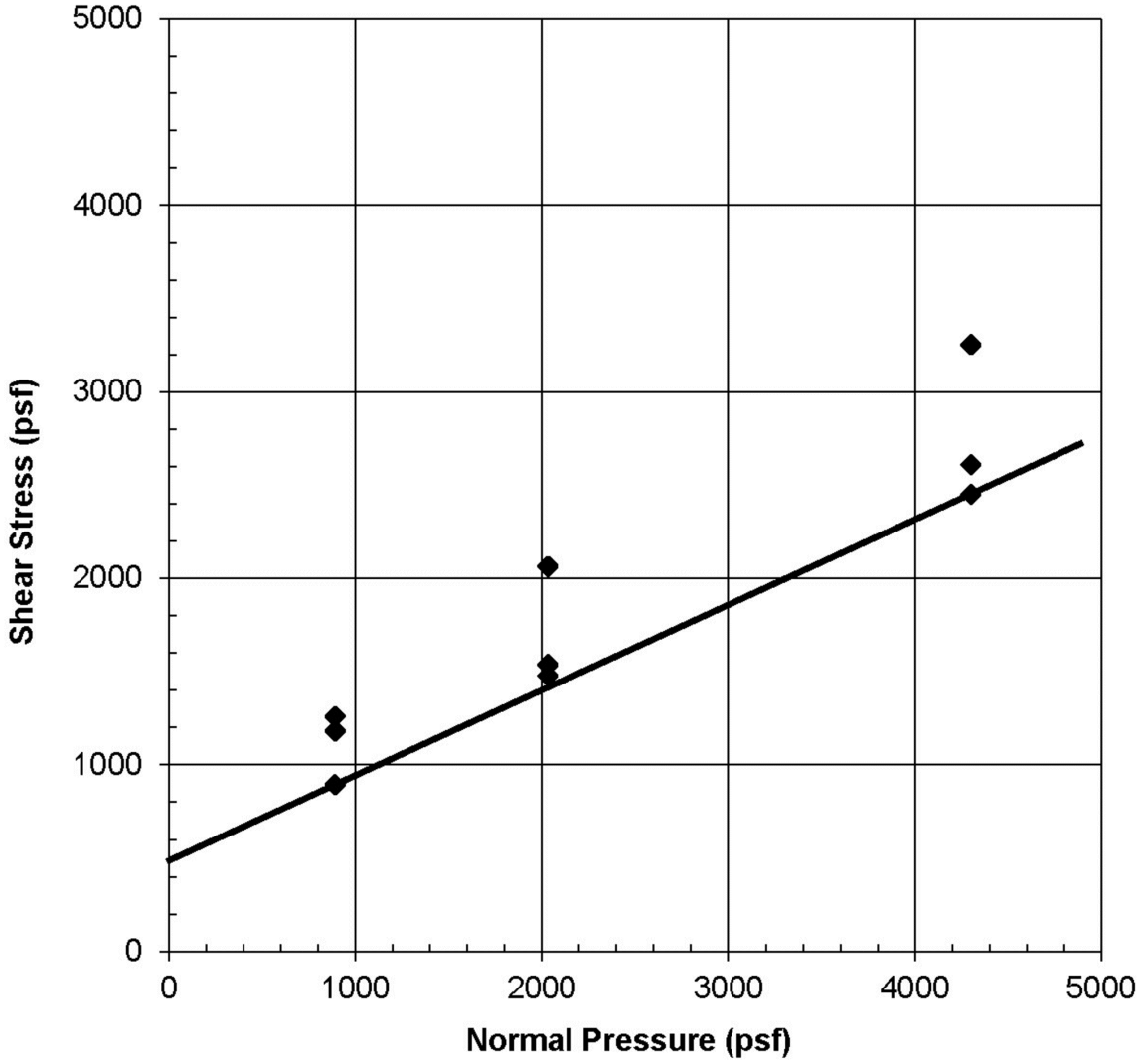
GEOLOGIC MAP

COTTONWOOD SAND MINING
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SCALE	1" = 200'
DATE	11 - 04 - 2020
PROJECT NO.	G2137 - 42 - 02
FIGURE	2B
SHEET	2 OF 2

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DIRECT SHEAR PLOT

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GC / CW		DSK/GTYPD	DATE 11 - 04 - 2020	PROJECT NO. G2137 - 42 - 02	FIG. 3

Plotted:11/04/2020 3:30PM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G2137-42-02 (Cottonwood Sand Mining)\DETAILS\Shear Plots.dwg

MATERIAL PROPERTIES:

Reclamation Conditions

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Piezometric Line
	Qal - Alluvium	110	490	25	1
	Qudf - Undocumented Fill	100	100	20	1

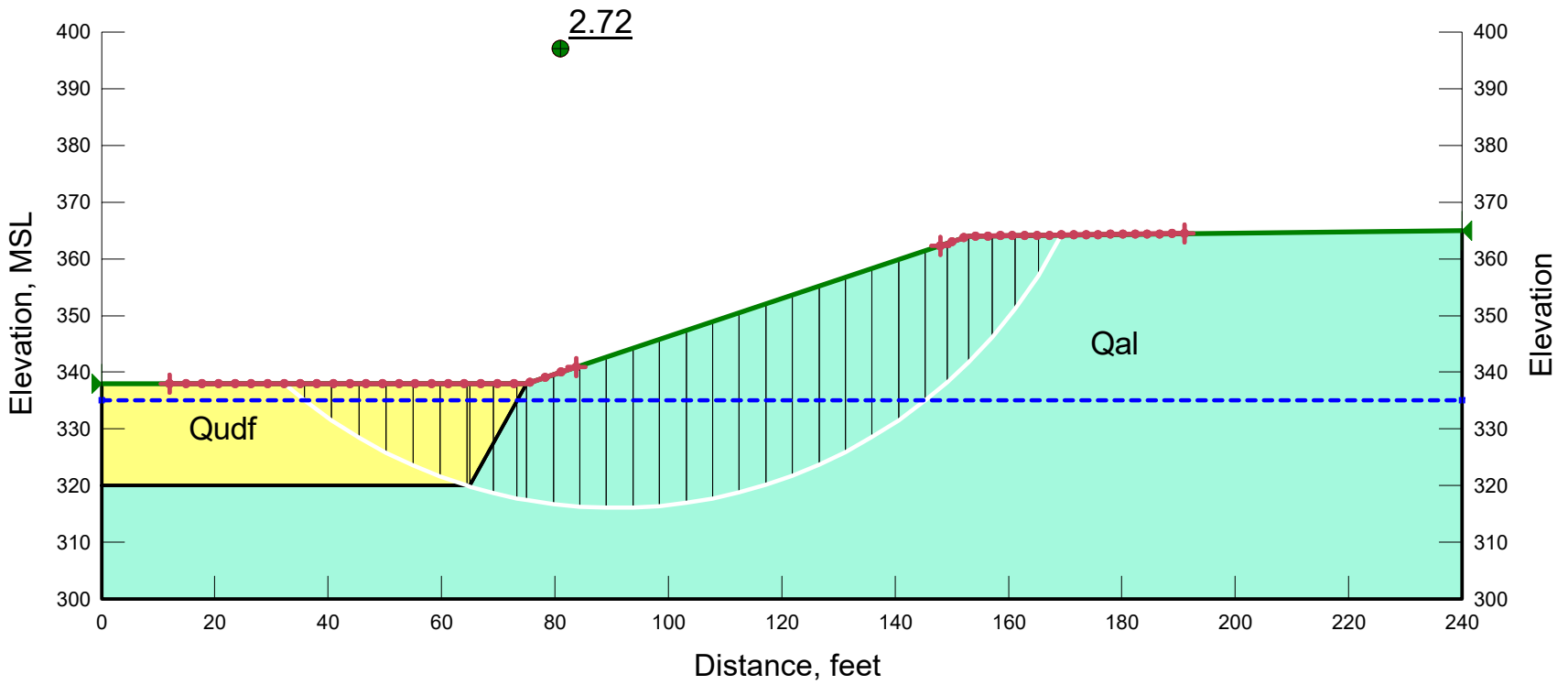


Figure 4

MATERIAL PROPERTIES:

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Piezometric Line
	Qal - Alluvium	110	490	25	1
	Qudf - Undocumented Fill	100	100	20	1

Reclamation Conditions

Seismic Analysis
keq = 0.175

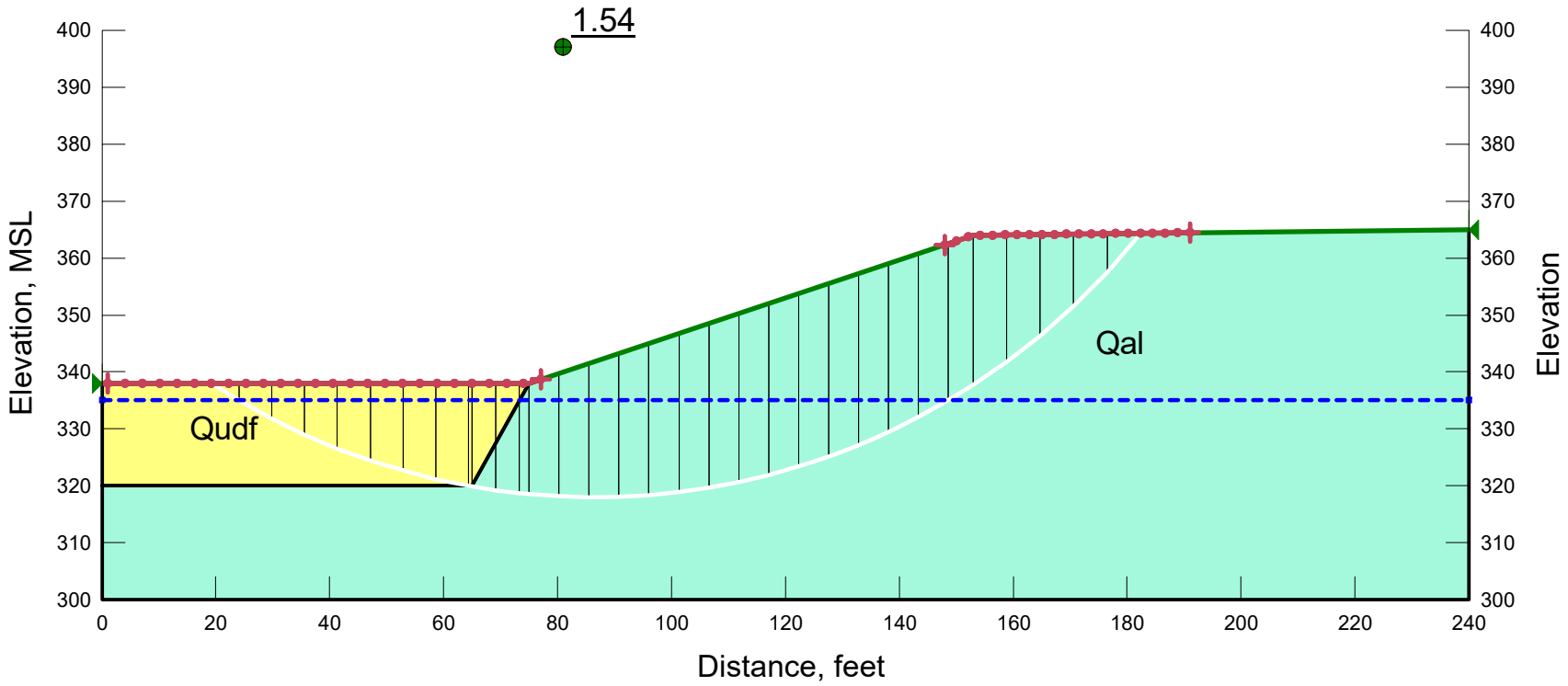


Figure 5

GEOCON

Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project	Cottonwood	Computed By	RCM
Project Number	G2137-42-02		
Date	11/04/20		
Filename			

Peak Ground Acceleration (Firm Rock), MHA_r, g	0.25	10% in 50 years
Modal Magnitude, M	7.7	
Modal Distance, r, km	48.0	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y/g	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft^2 (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95}\|_{med}$, sec	31.197	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m, sec	0.715	

Initial Screening with MHEA = MHA = k_{max}g

k_y/MHA	NA
$f_{EQ}(u=5cm) = (NRF/3.477)*(1.87-\log(u/((MHA_r/g)*NRF*D_{5-95})))$	0.6998
k_{EO} = feq(MHA_r)/g	0.175
Factor of Safety in Slope Analysis Using k_{EQ}	1.54

Passes Initial Screening Analysis

Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	NA
T_s/T_m	NA
MHEA/(MHA*NRF)	NA
NRF = 0.6225+0.9196EXP(-2.25*MHA_r/g)	1.15
MHEA/g	NA
k_y/MHEA = k_y/k_{max}	NA
Normalized Displacement, Normu	NA

Estimated Displacement, u (cm) NA

FIGURE 6

MATERIAL PROPERTIES:

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Piezometric Line
	Qal - Alluvium	110	490	25	1
	Qudf - Undocumented Fill	100	100	20	1

Reclamation Conditions

Temporary Slopes

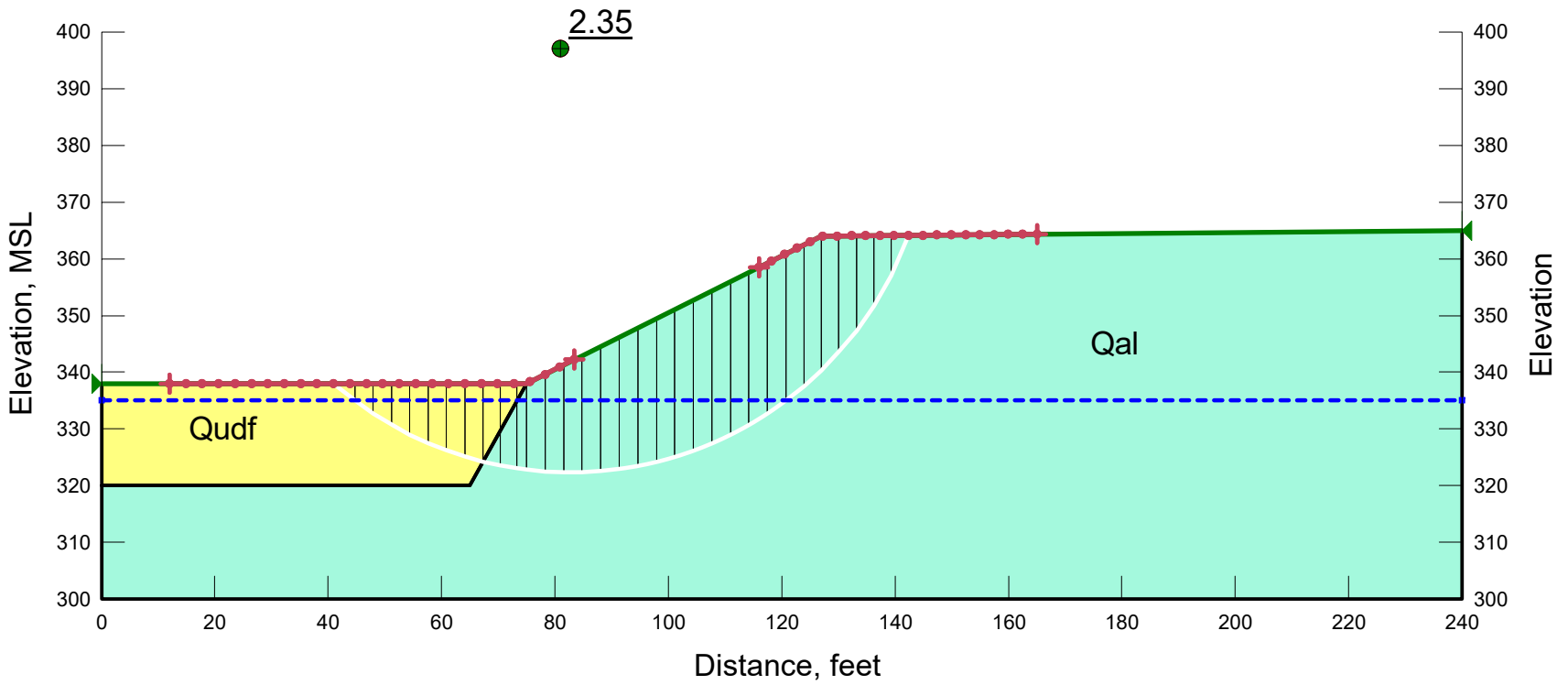


Figure 7

LIST OF REFERENCES

FEMA (2012), *Flood Insurance Rate Map (FIRM) Map Number 06073C1934G, Effective May 16, 2012*, http://www.fema.gov, accessed January 2, 2019;

Chang Consultants (2018), *Cottonwood Sand Mining Project, County of San Diego*, dated February 2, 2020.

Geocon (2017), *Evaluation Of Soils For Use As Construction Aggregate Sand, Cottonwood Golf Course, El Cajon, California*, Project No. G2137-42-01, July 19, 2017;

Tan, S. S., (2002a), *Geology of the El Cajon* 7.5' Quadrangle, San Diego County, California, 1:24,000 Scale;

Tan, S. S., (2002b), *Geologic Map of the Jamul Mountains* 7.5' Quadrangle, San Diego County, California, 1:24,000 Scale;

Risk Engineering (2011), *EZ-FRISK (version 7.62)*, software package used to perform site-specific earthquake hazard analyses. Accessed January 2, 2019;

CSRL (2008), *SoilWeb*, a streaming, seamless interface to USDA-NCSS SSURGO and STATSGO Soil Survey Products, by the California Soil Resource Lab, accessed December 28, 2018;

USDA (1953), Aerial photographs AXN 5M 167 and 168;

USGS (2016), *Quaternary Fault and Fold Database of the United States:* U.S. Geological Survey website, http://earthquakes,usgs.gov/hazards/qfaults, accessed December 28, 2018.

Attachment D.

Operations Procedure
Communication with Sweetwater Authority

Cottonwood Sand Mine Operations Plan
Water Transfer Communication with Sweetwater Authority

PURPOSE

The purpose of these procedures is to ensure that Cottonwood Sand Mine (Cottonwood) is notified of any water transfer or emergency release of water, whether intentional or un-intentional, from Loveland Reservoir to allow Cottonwood to respond appropriately. These procedures cover general notification, response, and reporting. They apply to workers, supervisors, area managers, site security and emergency responders.

These procedures are meant to allow efficient water transfer by Sweetwater Authority from Loveland Reservoir to the Sweetwater Reservoir using the Sweetwater River. These will be implemented to avoid impeding water flow, downstream property damage, potential safety hazards and pollution of water being transferred.

Cottonwood has granted Sweetwater Authority permission for access to the Cottonwood property to continue monitoring of groundwater conditions from two water wells located at the southwestern (Harwood or Ivanhoe #11) and northeastern property lines (Cottonwood East or Lakes #11) of the property. These two wells will be left in place for Sweetwater Authority's use after extraction operations have ended.

Notification and Response

Sweetwater Authority

Sweetwater staff will notify Cottonwood staff by telephone of an expected date and time of water release. This notification shall be done 48 hours in advance of the expected release. It is understood that Sweetwater Authority increases the release rate in steps in accordance with observed channel conditions downstream. As this release rate is to be increased, Sweetwater will notify Cottonwood Staff one (1) hour in advance of any increase of the water release.

Sweetwater Authority will contact Cottonwood when a groundwater monitoring event is planned. This contact shall occur, at a minimum, 48 hours in advance of the event. Sweetwater Authority will be responsible for all monitoring costs and will follow all safety regulations and procedures required at the mine site.

Cottonwood

Cottonwood will prepare to move or secure staff, mobile equipment, conveyor and materials from the existing channel. Cottonwood will continue to monitor the water release elevations at the mining site and, as necessary, move the equipment to higher elevations. Cottonwood will notify Sweetwater of water flow and operational conditions at the mining site as changes occur.

Cottonwood shall provide access to the two wells as requested and shall provide a safety briefing to Sweetwater Authority staff members at the start of each monitoring session. Cottonwood will maintain electrical service and operating water pumps for both wells during extraction operations.

Contacts

Sweetwater Authority

Primary Contact

- Name: Erick Del Bosque, Sweetwater Authority
- Phone: (619) 409-6752

Secondary Contact

- Name: Israel Marquez, Sweetwater Authority
- Phone: (619) 410-1590

Cottonwood Sand Mine:

Primary Contact:

- Name: James DeCarolis, EnviroMine Inc.
- Phone: (619) 284-8515

Secondary Contact:

- Name: Brice Bossler, Bossler Group
- Phone: (619) 850-1399

Key Facts

Sweetwater Authority owns and operates the Loveland Reservoir and the Sweetwater Reservoir that are located on the Sweetwater River. Both reservoirs serve as storage facilities for raw water that will be used as drinking water. Loveland Reservoir is located near the town of Alpine, CA and approximately 11 miles upstream of the Cottonwood Sand Mine property. This reservoir is used as a water storage reservoir. From which Sweetwater Authority transfers water to the Sweetwater reservoir. This is

completed by releasing water into the river channel through a control valve at the dam.

Water releases are, typically, timed to occur during the wet, winter months of December until March and are dependent on watershed conditions observed by Sweetwater Authority. Raw water is treated at the Sweetwater Reservoir and is used as drinking water by customers in the southern part of San Diego County.

Cottonwood is a surface mining operation located along the Sweetwater River between the reservoirs and is approximately 11.0 miles downstream of Loveland and approximately 5.0 miles upstream of the Sweetwater Reservoir. This operation extracts and processes sand and gravels from the alluvial deposits within the floodplain of the Sweetwater River. This operation serves the local construction industry and could be interrupted by water releases.

Attachment E

Hydraulic Analyses

CEQA-LEVEL DRAINAGE STUDY

FOR THE

COTTONWOOD SAND MINING PROJECT

(PDS2018-MUP-18-023)

July 24, 2024

Will sign and stamp upon approval

Wayne W. Chang, MS, PE 46548

ChangConsultants

Civil Engineering ◦ Hydrology ◦ Hydraulics ◦ Sedimentation

P.O. Box 9496
Rancho Santa Fe, CA 92067
(858) 692-0760

FOR REVIEW ONLY

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Sweetwater Authority Water Transfer Analyses....5
Conclusion and Certification....8

APPENDICES

A. Effective, Existing Condition (Corrected Effective), and Proposed Condition HEC-RAS Analyses

B. Water Transfer Data

MAP POCKET

Proposed Condition HEC-RAS Work Map

CD containing Rick Engineering Company LOMR files, Plot Plan and Reclamation Plan for the Cottonwood Sand Mining Project, HEC-RAS analyses, and FIRMs.

FOR REVIEW ONLY

INTRODUCTION

The Cottonwood Sand Mining Project is located at 3121 Willow Glen Road within the unincorporated southwestern portion of San Diego County (see Figure 1. Vicinity Map). The Assessor's Parcel Numbers are 506-021-19-00, 506-020-52-00, 518-012-13-00, 518-012-14-00, 518-030-05-00, 518-030-06-00 518-030-07-00, 518-030-08-00, 518-030-10-00, 518-030-12-00, 518-030-13-00, 518-030-15-00, 518-030-21-00, 518-030-22-00, 519-010-15-00, 519-010-17-00, 519-010-20-00, 519-010-21-00, 519-010-33-00, 519-010-34-00, 519-010-37-00, and 519-011-03-00. The site is on the east and west sides of Steele Canyon Road and historically supported two 18-hole golf courses referred to as the Lakes course and the Ivanhoe course. The Lakes course is along the westerly portion of the site and is no longer operational. The majority of the site is within the Sweetwater River 100-year floodplain and regulatory floodway. The Sweetwater River flows in a southwesterly direction through the site and is included on FEMA's May 16, 2012, *Flood Insurance Rate Map* No.'s 06073C1668G, 06073C1669G, 06073C1931G, and 06073C1932G (included on CD). FEMA's floodplain and regulatory floodway mapping has been updated by a Rick Engineering Company Letter of Map Revision, which is discussed in the next section.

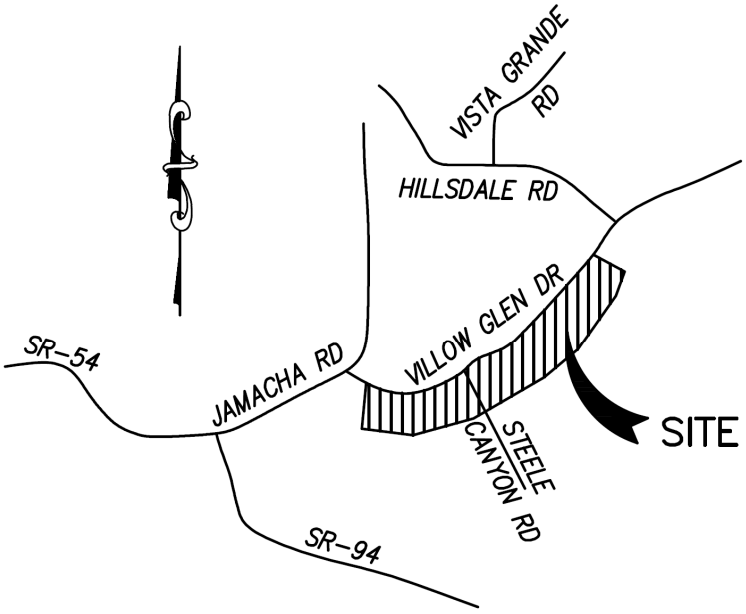


Figure 1. Vicinity Map

The project proposes mining and restoration activities within approximately 251 acres along and within the Sweetwater River floodplain. Extractive operations are expected to continue for 10 years in three mining phases with a total production of 3.8 million cubic yards (5.7 million tons). The maximum excavation depth is approximately 40 feet. Reclamation involving grading, habitat improvement, and revegetation would be an ongoing process starting in the second year as mining proceeds to the east and would continue in each subphase over approximately 10 years. Reclamation is anticipated to be concluded 2 years after mining completion. Post-mining

land use of the entire 280-acre property will include areas of sloped land and floodplain along the Sweetwater River and relatively flat areas along the property edges.

The project is primarily excavating within the FEMA floodplain and regulatory floodway, which will increase the flow conveyance area. This will be offset somewhat by the increased vegetation density resulting from replacing the existing golf course with revegetation and habitat restoration. A hydraulic goal is that the excavation will dominate over revegetation/restoration resulting in no increased 100-year water elevations on off-site areas, i.e., no-rise on off-site properties along the Sweetwater River.

The Sweetwater Authority (Authority) owns and manages Sweetwater Reservoir and Loveland Reservoir. Sweetwater Reservoir is a terminal drinking water reservoir located less than five miles downstream of the proposed project location. Loveland Reservoir is located near Alpine and approximately 10 miles upstream of the Project. Runoff from the upper Sweetwater River watershed is captured at Loveland Reservoir primarily during winter and spring months. Runoff stored at Loveland Reservoir can be transferred to Sweetwater Reservoir via the Sweetwater River channel to augment water production for the Authority's service area. The Loveland Reservoir bunger valve can release up to 358 cubic feet per second (cfs). Water transfers generally take place during the winter months of December, January, and/or February, which minimizes water loss due to evaporation or infiltration and aims to avoid negative impacts to the arroyo toad, a federally endangered species and state Species of Special Concern. However, water transfers could occur in the late winter or early spring (i.e., March and/or April) subject to environmental compliance, arroyo toad avoidance, and wildlife agency concurrence. Both Loveland Reservoir and Sweetwater Reservoir are a vital part of the San Diego region’s drinking water supply.

The Authority has senior water rights along the Sweetwater River. These water rights were acquired by the Authority through its predecessors and allow the Authority to transfer water from Loveland Reservoir to Sweetwater Reservoir along the Sweetwater River channel. Under pre-project conditions, the transferred water flows in a naturally-lined (earth, grass, and weeds) trapezoidal channel constructed within the golf course. The channel transitions to a broader riparian channel near the downstream portion of the site. The Sweetwater River floodplain will be altered within the project boundaries through implementation of mining activities; however, the bed and lower portion of the banks of the existing trapezoidal channel will be undisturbed in order to allow water transfer to continue along its current path without impacts. The maximum 358 cfs transfer flow rate along with concurrent historic precipitation will be accommodated by the project within the trapezoidal channel. This will prevent capture of the water transfer in the extraction areas. Hence, the project design will preserve the Authority’s ability to transfer water from Loveland Reservoir to Sweetwater Reservoir.

A conveyor system will be utilized during project operations to transport mined material. Portions of the conveyor system will be within the 100-year floodplain. These portions will either be anchored, as needed, to prevent displacement by flowing water or removed at least 24 hours prior to forecast of significant rain (over 0.5 inches). The conveyors shall also be anchored, as needed, during scheduled water transfers. The conveyors are primarily aligned in the direction

of flow and have a profile that causes minimal flow blockage, so will have minimal impact on water surface elevations and will not alter, divert, or impeded water transfers or natural flows.

Two adjacent SDG&E transmission towers exist on-site just upstream of Steele Canyon Road. The towers and ground supporting the towers will remain and not be disturbed by mining activities. A ramp will be provided from the extraction area to the towers for access. The ramp and slopes surrounding the towers shall be lined, as needed, for access and to prevent erosion. The project is designed so that retention of the towers meets the no-rise criteria.

This CEQA-level report contains pre- (existing condition) and post-project (proposed condition) hydraulic analyses demonstrating that no-rise in the 100-year water surface elevations will occur off-site. The extraction will occur in phases (see Figure 2. Project Phasing at the end of this report). Since the project primarily involves extraction in the floodplain, the individual phases (Phase 1 to 3) will meet the off-site no-rise criteria. The final reclamation (Phase 4) will also meet the criteria. Since the project is for mining and restoration, minimal impervious surfaces will be added. The largest proposed impervious area is associated with the proposed Willow Glen Drive improvements. Stormwater runoff from Willow Glen Drive would be directed along the southerly curb of Willow Glen Drive and conveyed into tree wells just south of the roadway The on-site project footprint will not increase the off-site flow rates since there are minimal impervious areas proposed on-site. In fact, the extraction areas will provide detention and retention benefits during mining that will reduce off-site surface flow rates.

Hydrologic and hydraulic analyses are provided to assess the Authority's water transfer based on their Loveland Reservoir releases through the bunger valve in combination with precipitation events. The analyses are used to size the existing on-site trapezoidal channel so that it can continue to convey the maximum water transfer flow rate anticipated based on data from the last 12 years.

Rational method hydrologic analyses are not applicable to the project since the majority of the site is within the Sweetwater River 100-year floodplain (see the HEC-RAS Work Map in the map pocket). According to the U.S. Geological Survey's (USGS) Streamstats software contained after this report text, the Sweetwater River watershed tributary to the site covers over 155 square miles. The project runoff and floodplain are associated with the river flow generated by the watershed. The river flow cannot be determined using the rational method. The river flow is based on FEMA data. The river flow exits the westerly (downstream) end of the site and is considered to be the same under existing and proposed conditions (see Table 1).

Condition	Watershed Area, sq. mi.	100-Year Flow, cfs
Existing	155.6	29,500
Proposed	155.6	29,500

Note: Tc, I, and C are not applicable for river flow.

Table 1. Hydrology Summary

HYDRAULIC ANALYSES

The pre-project hydraulic conditions are established by a Letter of Map Revision (LOMR) for the Cottonwood Golf Course by Rick Engineering Company (Rick). The LOMR has been approved by the County of San Diego and FEMA (LOMR Case No. 20-09-2025P dated December 1, 2020, effective April 14, 2021). Rick's latest LOMR files are included on the CD. The LOMR includes an As-Built Conditions HEC-RAS model that reflects the pre-project 100-year floodplain and regulatory floodway. The As-Built model represents the effective conditions along the site. The As-Built results are included in Appendix A and the plan has been added to the HEC-RAS model prepared for the project. It was noted that when the As-Built plan was executed in the latest version of HEC-RAS (v 6.1.0), some of the base flood elevations changed by a few hundredths. Review of the As-Built HEC-RAS model revealed that the effective flow area associated with Steele Canyon Road did not reflect an existing culvert under the southerly portion of the road crossing, so a corrected effective model was created that widens the effective flow area based on the culvert. The corrected effective model is included with Rick's HEC-RAS model on the CD as well as on the HEC-RAS model prepared for the project, and its summary output and cross-section plots are included in Appendix A.

The post-project HEC-RAS cross-sections, base topography, and proposed grading are shown on the Proposed Condition HEC-RAS Work Map in the map pocket. The mapping is on NGVD 29. The cross-sections are at the same locations as the LOMR analysis. The cross-sections were created from various sources. Downstream cross-section 5 and upstream cross-sections 394.1 to 398 were reproduced from the LOMR As-built geometry. Cross-sections 120 and 130 bounding the Steele Canyon Road crossing were also reproduced from the As-built geometry. The remaining cross-sections are along the proposed mining and reclamation footprint, so were created based on the phased mining and reclamation grading as well as the project's topographic mapping for the surrounding area.

The remaining post-project HEC-RAS input parameters are as follows. The FEMA 100-year flow rate of 29,500 cfs was used throughout the study reach. The roughness coefficients in the areas outside the project footprint are based on the roughness coefficients in the As-built model. These range from 0.025 to 0.080. The roughness coefficient within the excavation area was assigned a value of 0.11 to reflect dense, mature vegetation resulting from restoration. The *San Diego County Hydraulic Design Manual* Section 5.6.2 states the roughness can be justified using information such as existing adjacent vegetative conditions. As a result, the vegetated restoration roughness has been modeled similar to the existing vegetated areas upstream and downstream of the site. The ineffective flow areas are based on the LOMR ineffective flow areas except as noted near Steele Canyon Road. Material stockpiles will be present during the mining phases. Blocked obstructions were used to represent the stockpile locations during mining. The obstructions are removed for the post-mining phase.

The existing/effective (As-built), corrected effective, and phased proposed condition 100-year HEC-RAS results are included in Appendix A and on the CD. Separate proposed condition results have been determined for mining during Phase 1 to 3 as well as the final reclaimed Phase 4 landform. The 100-year water surface elevations are summarized in Table 2. Table 2 shows that the project is generally lowering water surface elevations compared to the effective results

(the effective results were run on the latest version of HEC-RAS, v 6.1.0) due to the excavation. There is a small rise in the 100-year water surface elevation at cross-sections 20 and 60, but the rise occurs on-site. There is also a small rise at cross-section 140, but this can be adjusted by revising the roughness. Table 3 contains a comparison of the Phase 1 through 4 water surface elevations with the corrected effective results. This table shows that the small rise only occurs at cross-sections 20 and 60, so are contained on-site.

Velocities over 6 feet per second are typically considered to be erosive. The proposed velocities within the site at the completion of mining are less than 6 feet per second (fps) except at cross-sections 120 and 130. Grouted light class riprap will be installed here to prevent erosion associated with upstream headcutting. Similar grouted riprap will be placed at the upstream end of the quarry to prevent upstream headcutting. The operator shall routinely inspect the areas during ongoing mining and provide erosion protection measures and maintenance, as needed, and documented in the Industrial SWPPP.

Ultimately, a Conditional Letter of Map Revision and Letter of Map Revision will be performed to define the proposed condition floodplain and regulatory floodway.

SWEETWATER AUTHORITY WATER TRANSFER ANALYSES

The Sweetwater Authority occasionally transfers water from Loveland Reservoir to the Sweetwater Reservoir to augment the local water supply available to consumers. The water transfers primarily occur during the winter to spring months and are controlled by operating the bunger valve at Loveland Reservoir. Since the releases typically occur during the rainy season (i.e., during atmospheric river flows), the flow rate during transfers can include a rainfall contribution. Transfers are primarily performed during the rainy season since infiltration and evaporative losses are reduced due to greater soil saturation and the cooler climate. The maximum release rate from the bunger valve is 358 cfs. The transfer rate downstream of the reservoir can exceed this due to the additional rainfall contribution.

The project intends to maintain the current water transfer conveyance provided within the site. This will be accomplished by preserving the portion of the on-site trapezoidal channel that is needed to convey the maximum water transfer flow rate. Hydrologic analyses were performed to determine the maximum flow rate. The analyses were based on historic transfer data from release dates given by the Authority. Hydraulic analyses were performed to assess the size of channel needed to convey the maximum transfer rate.

The Authority provided release data since 2010 to assist in assessing the maximum transfer rate within the project. The data is summarized in Table 4 and shows that six transfers occurred over the past 12 years. The end date is when water was last captured at Sweetwater Reservoir, not when the valve was closed. The transfers ranged over a period of 18 to 29 days. Loveland Reservoir also experienced overtopping spills in 2011 to 2012. The overtopping flows were not assessed since they were not planned water transfers.

Year	Begin Transfer	End Transfer
2010	1/28/2010	2/18/2010
2012	1/24/2012	2/11/2012
2013	1/18/2013	2/05/2013
2017	2/28/2017	3/19/2017
2019	2/15/2019	3/10/2019
2021	1/11/2021	2/09/2021

Table 4. Water Transfer Periods

The Sweetwater River flow rate was determined for each transfer period. The USGS operates a stream gage (Station No. USGS 11016200, Sweetwater R A Dehesa CA) where the river crosses Sloane Canyon Road (see Figure 3. USGS Sweetwater River Rain Gage), which is approximately midway between the site and Loveland Reservoir. The measured flow rates are provided at 15 minute intervals and were obtained for each period in Table 4 (see Appendix B). The maximum flow rate over each period is summarized in Table 5 along with the date. The greatest flow rate occurred in 2017 and was 591 cfs. This was measured at 3:30 AM on the initial release date in 2017. Therefore, this is likely associated with antecedent rainfall rather than the release. The flow rate lowered over 200 cfs to 388 cfs on the subsequent day, March 1st.

Year	Date	Maximum Flow Rate, cfs
2010	January 31	353
2012	February 6	400
2013	January 25	344
2017	February 28	591
2019	February 21	421
2021	January 21	338

Table 5. USGS Sweetwater River Stream Gage Measurements

Since water transfers can occur during the rainy season, precipitation records were obtained for each period. In order to account for rainfall immediately prior to a transfer period the records were obtained beginning a week before the initial transfer date. Some of the flow rates measured in Table 5 are higher than the valve release rate of 358 cfs, which indicates that the transfer rate includes rainfall contribution in some instances. The County of San Diego operates the Roads Division 1 rain gage at their Roads Department at 11970 Singer Lane in Spring Valley (see Figure 4. County of San Diego Roads Division 1 Rain Gage). This location is approximately 1 mile west of the site, so is representative of rainfall at the site. The precipitation data from 2010 is provided as daily totals, while the precipitation data from 2012 to 2021 is graphed as accumulated rainfall (see Appendix B). For the accumulated rainfall, a horizontal curve indicates zero to minor rainfall, while a steeper curve indicates greater rainfall. Table 6 summarizes the rainfall events for each year. The rainfall date is listed followed by the associated rainfall in parentheses. Minor events with minimal rainfall are not included.

Year	Date (Rainfall, inches)
2010	1/21-1/22 (1.72"), 2/6 (0.64"), 2/9 (0.52")
2012	1/21 (0.10"), 1/23 (0.27"), 2/7 (0.10")
2013	1/25-1/26 (1.35")
2017	2/27 (2.04")
2019	2/13-2/14 (1.67"), 2/17-2/18 (0.35"), 2/20-2/21 (0.46"), 3/02 (0.15"), 3/06 (0.09")
2021	1/23 (0.31"), 1/25 (0.26"), 1/26 (0.19"), 1/29 (0.69", 0.07", 0.13")

Table 6. Rainfall from Roads Division 1 Gage Measurements

The following assesses the rainfall contribution during each water transfer year. In 2010, heavy rainfall occurred a week before the initial transfer date. This did not impact the water transfer rate, since the flow rate on the initial transfer date starts at 0 cfs and has a maximum of 66 cfs. On February 6th and 9th moderate rainfall occurred. The flow rate decreased the day after both of these dates, but did increase from February 8th to 9th. Therefore, the February 6th event did not appear to have much impact on flow rate, but the February 9th event did cause an increase. In both cases the flow rate was less than the maximum bunger valve release rate of 358 cfs.

In 2012, the rainfall was relatively minor. Two rain events occurred one to three days before the initial transfer date. The associated flow rate on the initial transfer date was small at 11 cfs. The rainfall during the water transfer period merely measured 0.10 inches, so the rainfall had minor contribution to the water transfer.

In 2013, a heavy rainfall occurred a week into the water transfer from January 25th to 26th. The water transfer rate was relatively high on January 25th at 344 cfs, but lowered below 200 cfs on the 26th and 27th. It's possible that the bunger valve release was reduced due to rainfall causing the lowering. The water transfer in 2013 did not exceed the maximum bunger valve release rate of 358 cfs despite the rainfall.

In 2017, heavy rainfall occurred a day before the initial release date. The flow rate on the release date was 591 cfs, which is the greatest water transfer rate over the period of record. This is primarily due to the preceding rainfall that exceeded 2 inches.

In 2019, heavy rainfall occurred in the two days prior to the initial release date. As a result, the water transfer rate on the release date started at 128 cfs, but reached 358 cfs, which coincidentally corresponds to the maximum bunger valve release rate. Mild to moderate rainfall occurred at various times during the release period. The water transfer rate generally remained above 300 cfs and reached as high as 421 cfs. The 421 cfs occurred during a period with 0.46 inches of rain.

In 2021, mild to moderately heavy rainfall occurred during the water transfer period. During the milder events from January 23rd to 26th, the water transfer was around 300 cfs. During the heavier rainfall on January 29th, the transfer lowered towards 100 cfs. This may be due to reduction of the bunger valve release.

The rainfall and stream gage records show that the maximum water transfer associated with rainfall during the water transfer periods primarily remained at or below 400 cfs. In 2021, rainfall caused the water transfer to reach 421 cfs on one day. In 2017, the water transfer on the initial release date reached 591 cfs due to heavy rainfall exceeding 2 inches on the preceding day. As mentioned above, the flow rates are measured at Sloane Canyon Road, which is several miles upstream of the project. There will be additional flow added below Sloane Canyon Road during rainfall events, but the data shows that this will generally be minor. This will be offset a small amount by infiltration and evaporative losses (minor during storm events) and a larger amount by storage losses. The large pond immediately downstream of Sloane Canyon Road as well as the natural drainage channel and overbank areas provide significant storage. Based on this, the on-site channel has been designed to convey the maximum historic water transfer measured at 591 cfs. This occurred once over the 128 days of total historic water transfer or 0.8 percent of the time.

Normal depth analyses were used to size the on-site trapezoidal channel. The existing channel will remain. The mining activities will lower the channel banks, but the banks will remain at 3.7 feet high in order to convey the water transfer. For mined areas behind the banks, the ground will be sloped at no steeper than 4:1 (horizontal:vertical) to meet the ground surface. Separate normal depth analyses were performed for the upper and lower portions using FlowMaster. The upper portion of the channel is narrower and steeper than the lower portion. The average channel dimensions, side slopes, and longitudinal slopes were determined from 2-foot contour interval topographic mapping. The channel bed will remain undisturbed. The upper channel will maintain the current bed width of approximately 25 feet and the lower channel will maintain the current bed width of approximately 50 feet. The existing side slopes will be generally unchanged. The FlowMaster results are included in Appendix B. They show that the capacity of the upper and lower channels is 618 and 756 cfs, respectively. Therefore, the maximum historic water transfer of 591 cfs will be conveyed in the on-site channel with a factor of safety. The results also show flow velocities of 5.2 and 3.6 fps, which indicate low erosion potential.

Based on these analyses, the trapezoidal channel that will remain during and after mining will convey water transfer flow rates similar to pre-project conditions. This will avoid water transfer flow and capture beyond the channel limits. The channel has been conservatively sized to convey the maximum water transfer flow rate. The typical water transfer flow rates are much lower than the maximum.

CONCLUSION AND CERTIFICATION

CEQA-level hydraulic analyses have been performed for the proposed Cottonwood Sand Mining Project along the Sweetwater River in the county of San Diego, California. This report includes existing and proposed condition 100-year HEC-RAS hydraulic analyses. The existing condition analyses are from a corrected Rick Engineering Company As-built model included in the Cottonwood Golf Course LOMR approved by FEMA. The proposed condition analyses show that the 100-year flow velocities within the project are generally low and considered non-erosive. Grouted riprap will be installed on some of the pit slopes to protect against upstream headcutting.

The riprap will not prevent nor impede water transfer along the low flow channel. An Industrial SWPPP will address BMPs required for operations.

Since the project proposes mining and restoration in the floodplain, the floodplain is being altered somewhat. In most areas, the 100-year water surface elevations are lowered due to the instream excavation. The river course and on-site drainage patterns are generally being maintained as evidenced by comparison of the effective and proposed condition floodplains on the HEC-RAS Work Map. The flow velocities are generally being reduced since the mining increases conveyance, so the project will not cause substantial erosion. The mining pits will have the ability to capture sediment and reduce downstream sedimentation. The project is creating minimal impervious surfaces, so the river's 100-year flow rate is not altered.

The following summarizes the CEQA-level requirements:

- The project will not substantially alter the existing drainage pattern of the site or area. In addition, there are no significant impervious areas such that an increase in the rate or amount of surface runoff will occur. The site and area runoff will continue to be conveyed to the Sweetwater River that flows through the site – flows would not be impeded or redirected. The Sweetwater River will continue to flow in the same direction through the site. Riprap will be installed at the upstream end of the mining pit to prevent headcutting erosion. The mining pit will reduce downstream siltation since it spreads the river flow and reduces flow velocities.

- The project proposes minor impervious surfaces, so will essentially maintain existing storm runoff flow rates. The project meets no-rise criteria, so will not cause on- or off-site flood inundation impacts.

- The project is primarily within the Sweetwater River floodplain. There are no existing or planned storm water drainage systems in the floodplain that will be impacted by the project since the flow rate is not being altered and the no-rise criteria is met.

- The project does not propose housing.

This is to certify that I am a duly qualified registered professional engineer licensed to practice in the State of California.

Name of Report: *CEQA-Level Drainage Study for the Cottonwood Sand Mining Project*
Date of Report: July 24, 2024

Will sign and stamp upon approval

Date: July 24, 2024
Name: Wayne W. Chang

Mining Phase	Phase Area (acres)	Sub-phase Area (acres)	Mining Duration (years)	Mining Initiation Date (est.)	Mining Completion Date (est.)	Reclamation Completion Date (est.)
1	78.98		3	2025	2028	2030
Sub-phase 1a		22.10	1			
Sub-phase 1b		26.46	1			
Sub-phase 1c		30.42	1			
2	48.18		3	2028	2031	2033
Sub-phase 2a		15.26	1			
Sub-phase 2b		19.08	1			
Sub-phase 2c		13.74	1			
3	78.57		4	2031	2035	2037
Sub-phase 3a		29.42	1			
Sub-phase 3b		16.15	1			
Sub-phase 3c		14.13	1			
Sub-phase 3d		18.87	1			
Phase 4	8.65		1	2035	2035	2037
Total	214.4		10	-	-	

Figure 2. Project Phasing

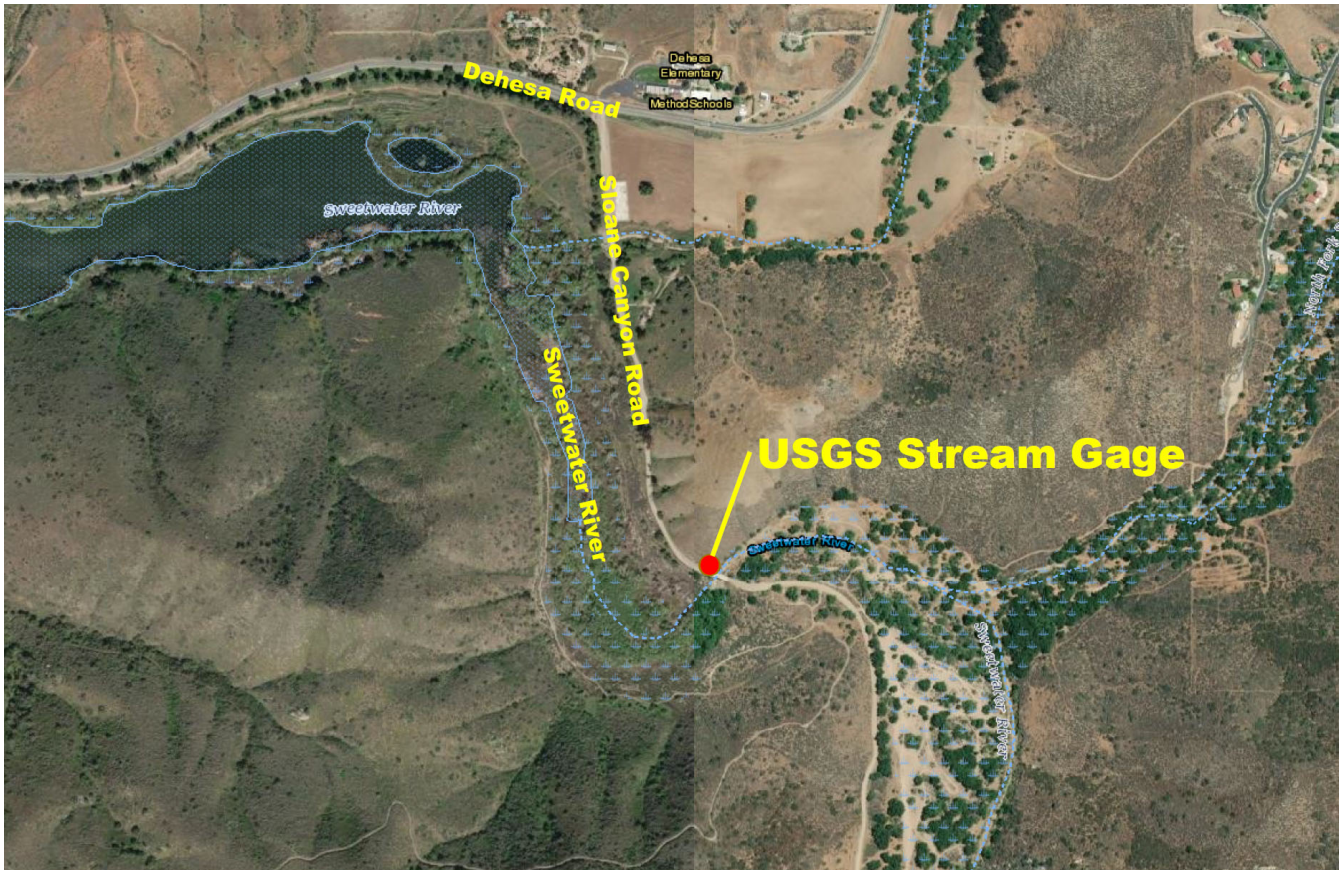


Figure 3. USGS Sweetwater River Rain Gage

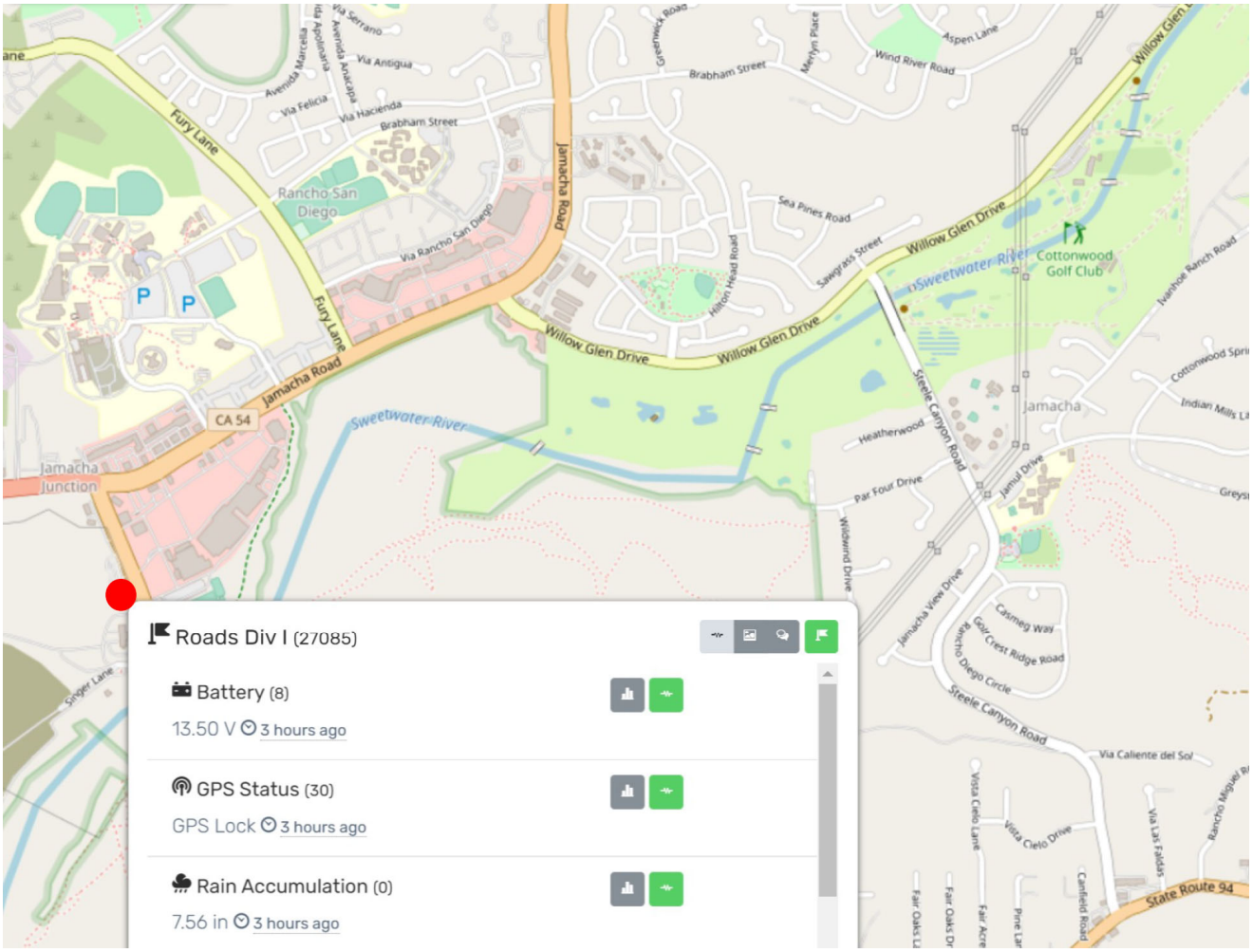


Figure 4. County of San Diego Roads Division 1 Rain Gage

Station	Effective[1], ft	Prop. Cond. Phase 1, ft	Phase 1 – Corr. Eff., ft	Prop. Cond. Phase 2, ft	Phase 2 – Corr. Eff., ft	Prop. Cond. Phase 3, ft	Phase 3 – Corr. Eff., ft	Prop. Cond. Phase 4, ft	Phase 4 – Corr. Eff., ft
398	383.17	383.17	0.00	383.17	0.00	383.17	0.00	383.17	0.00
396	378.38	378.38	0.00	378.38	0.00	377.94	-0.44	377.93	-0.45
394.1	377.81	377.81	0.00	377.81	0.00	376.97	-0.84	376.94	-0.87
320	376.30	376.30	0.00	376.30	0.00	375.09	-1.21	375.12	-1.18
310	376.28	376.28	0.00	376.28	0.00	374.86	-1.42	374.88	-1.40
300	375.73	375.73	0.00	375.73	0.00	374.07	-1.66	374.07	-1.66
290	375.52	375.52	0.00	375.52	0.00	373.18	-2.34	373.18	-2.34
280	372.00	372.00	0.00	372.00	0.00	362.75	-9.25	363.63	-8.37
270	370.66	370.66	0.00	370.66	0.00	361.11	-9.55	362.54	-8.12
260	367.90	367.90	0.00	367.90	0.00	359.20	-8.70	361.46	-6.44
250	365.55	365.55	0.00	365.45	-0.10	357.17	-8.38	360.26	-5.29
240	365.31	365.31	0.00	365.17	-0.14	357.14	-8.17	360.24	-5.07
230	364.67	364.67	0.00	364.37	-0.30	356.19	-8.48	359.39	-5.28
220	363.65	363.65	0.00	363.65	0.00	356.15	-7.50	359.35	-4.30
210	362.54	362.54	0.00	356.97	-5.57	354.94	-7.60	357.79	-4.75
200	361.42	361.42	0.00	356.90	-4.52	354.90	-6.52	357.72	-3.70
190	359.56	359.56	0.00	355.37	-4.19	353.92	-5.64	355.74	-3.82
180	356.18	356.18	0.00	354.12	-2.06	353.11	-3.07	354.46	-1.72
170	354.53	354.53	0.00	351.69	-2.84	351.66	-2.87	352.37	-2.16
160	353.77	353.77	0.00	351.56	-2.21	351.58	-2.19	352.24	-1.53
150	351.69	351.69	0.00	349.73	-1.96	349.73	-1.96	349.71	-1.98
140	349.31	349.51	0.20	349.44	0.13	349.44	0.13	349.44	0.13
130	348.47	348.46	-0.01	348.46	-0.01	348.46	-0.01	348.47	0.00
120	346.46	346.46	0.00	346.46	0.00	346.46	0.00	346.46	0.00
110	343.57	342.69	-0.88	342.69	-0.88	342.69	-0.88	342.62	-0.95
100	343.29	341.94	-1.35	341.94	-1.35	341.94	-1.35	341.9	-1.39
90	342.31	340.53	-1.78	340.53	-1.78	340.53	-1.78	340.53	-1.78
80	341.24	340.45	-0.79	340.45	-0.79	340.45	-0.79	340.45	-0.79
70	339.40	339.28	-0.12	339.28	-0.12	339.28	-0.12	339.28	-0.12
60	339.14	339.21	0.07	339.21	0.07	339.21	0.07	339.21	0.07
50	337.58	337.28	-0.30	337.28	-0.30	337.28	-0.30	337.28	-0.30
40	336.13	335.63	-0.50	335.63	-0.50	335.63	-0.50	335.63	-0.50
30	335.13	334.80	-0.33	334.80	-0.33	334.80	-0.33	334.8	-0.33
20	333.90	333.91	0.01	333.91	0.01	333.91	0.01	333.91	0.01
10	333.85	333.75	-0.10	333.75	-0.10	333.75	-0.10	333.75	-0.10
5	330.28	330.28	0.00	330.28	0.00	330.28	0.00	330.28	0.00

[1]The effective analysis was run on HEC-RAS v 6.1.0

Table 2. Comparison of 100-Year Water Surface Elevations for Proposed vs. Effective Conditions (a negative number indicates that the project is lowering the 100-year water surface elevation)

Station	Corrected Effective, ft	Prop. Cond. Phase 1, ft	Phase 1 – Corr. Eff., ft	Prop. Cond. Phase 2, ft	Phase 2 – Corr. Eff., ft	Prop. Cond. Phase 3, ft	Phase 3 – Corr. Eff., ft	Prop. Cond. Phase 4, ft	Phase 4 – Corr. Eff., ft
398	383.17	383.17	0.00	383.17	0.00	383.17	0.00	383.17	0.00
396	378.38	378.38	0.00	378.38	0.00	377.94	-0.44	377.93	-0.45
394.1	377.81	377.81	0.00	377.81	0.00	376.97	-0.84	376.94	-0.87
320	376.30	376.30	0.00	376.30	0.00	375.09	-1.21	375.12	-1.18
310	376.28	376.28	0.00	376.28	0.00	374.86	-1.42	374.88	-1.40
300	375.73	375.73	0.00	375.73	0.00	374.07	-1.66	374.07	-1.66
290	375.52	375.52	0.00	375.52	0.00	373.18	-2.34	373.18	-2.34
280	372.00	372.00	0.00	372.00	0.00	362.75	-9.25	363.63	-8.37
270	370.66	370.66	0.00	370.66	0.00	361.11	-9.55	362.54	-8.12
260	367.90	367.90	0.00	367.90	0.00	359.20	-8.70	361.46	-6.44
250	365.55	365.55	0.00	365.45	-0.10	357.17	-8.38	360.26	-5.29
240	365.31	365.31	0.00	365.17	-0.14	357.14	-8.17	360.24	-5.07
230	364.67	364.67	0.00	364.37	-0.30	356.19	-8.48	359.39	-5.28
220	363.65	363.65	0.00	363.65	0.00	356.15	-7.50	359.35	-4.30
210	362.54	362.54	0.00	356.97	-5.57	354.94	-7.60	357.79	-4.75
200	361.42	361.42	0.00	356.90	-4.52	354.90	-6.52	357.72	-3.70
190	359.56	359.56	0.00	355.37	-4.19	353.92	-5.64	355.74	-3.82
180	356.18	356.18	0.00	354.12	-2.06	353.11	-3.07	354.46	-1.72
170	354.53	354.53	0.00	351.69	-2.84	351.66	-2.87	352.37	-2.16
160	353.77	353.77	0.00	351.56	-2.21	351.58	-2.19	352.24	-1.53
150	351.69	351.69	0.00	349.73	-1.96	349.73	-1.96	349.71	-1.98
140	349.55	349.51	-0.04	349.44	-0.11	349.44	-0.11	349.44	-0.11
130	348.47	348.46	-0.01	348.46	-0.01	348.46	-0.01	348.47	0.00
120	346.46	346.46	0.00	346.46	0.00	346.46	0.00	346.46	0.00
110	343.81	342.69	-1.12	342.69	-1.12	342.69	-1.12	342.62	-1.19
100	343.29	341.94	-1.35	341.94	-1.35	341.94	-1.35	341.9	-1.39
90	342.31	340.53	-1.78	340.53	-1.78	340.53	-1.78	340.53	-1.78
80	341.24	340.45	-0.79	340.45	-0.79	340.45	-0.79	340.45	-0.79
70	339.40	339.28	-0.12	339.28	-0.12	339.28	-0.12	339.28	-0.12
60	339.14	339.21	0.07	339.21	0.07	339.21	0.07	339.21	0.07
50	337.58	337.28	-0.30	337.28	-0.30	337.28	-0.30	337.28	-0.30
40	336.13	335.63	-0.50	335.63	-0.50	335.63	-0.50	335.63	-0.50
30	335.13	334.80	-0.33	334.80	-0.33	334.80	-0.33	334.8	-0.33
20	333.90	333.91	0.01	333.91	0.01	333.91	0.01	333.91	0.01
10	333.85	333.75	-0.10	333.75	-0.10	333.75	-0.10	333.75	-0.10
5	330.28	330.28	0.00	330.28	0.00	330.28	0.00	330.28	0.00

[1]The corrected effective analysis was run on HEC-RAS v 6.1.0

Table 3. Comparison of 100-Year Water Surface Elevations for Proposed vs. Corrected Effective Conditions (a negative number indicates that the project is lowering the 100-year water surface elevation)

StreamStats Report

Region ID: CA
Workspace ID: CA20201105164552757000
Clicked Point (Latitude, Longitude): 32.74180, -116.92806
Time: 2020-11-05 08:46:11 -0800



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLDEM30M	Mean basin slope computed from 30 m DEM	23.1	percent

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	155.6	square miles
ELEV	Mean Basin Elevation	2659	feet
ELEVMAX	Maximum basin elevation	6465	feet
LFPLENGTH	Length of longest flow path	44	miles
MINBELEV	Minimum basin elevation	330	feet
OUTLETELEV	Elevation of the stream outlet in feet above NAVD88	330	feet
PRECIP	Mean Annual Precipitation	22.3	inches
RELIEF	Maximum - minimum elevation	6135	feet

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

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Application Version: 4.4.0

APPENDIX A

EFFECTIVE,
EXISTING CONDITION
(CORRECTED EFFECTIVE),
AND
PROPOSED CONDITION
HEC-RAS ANALYSES

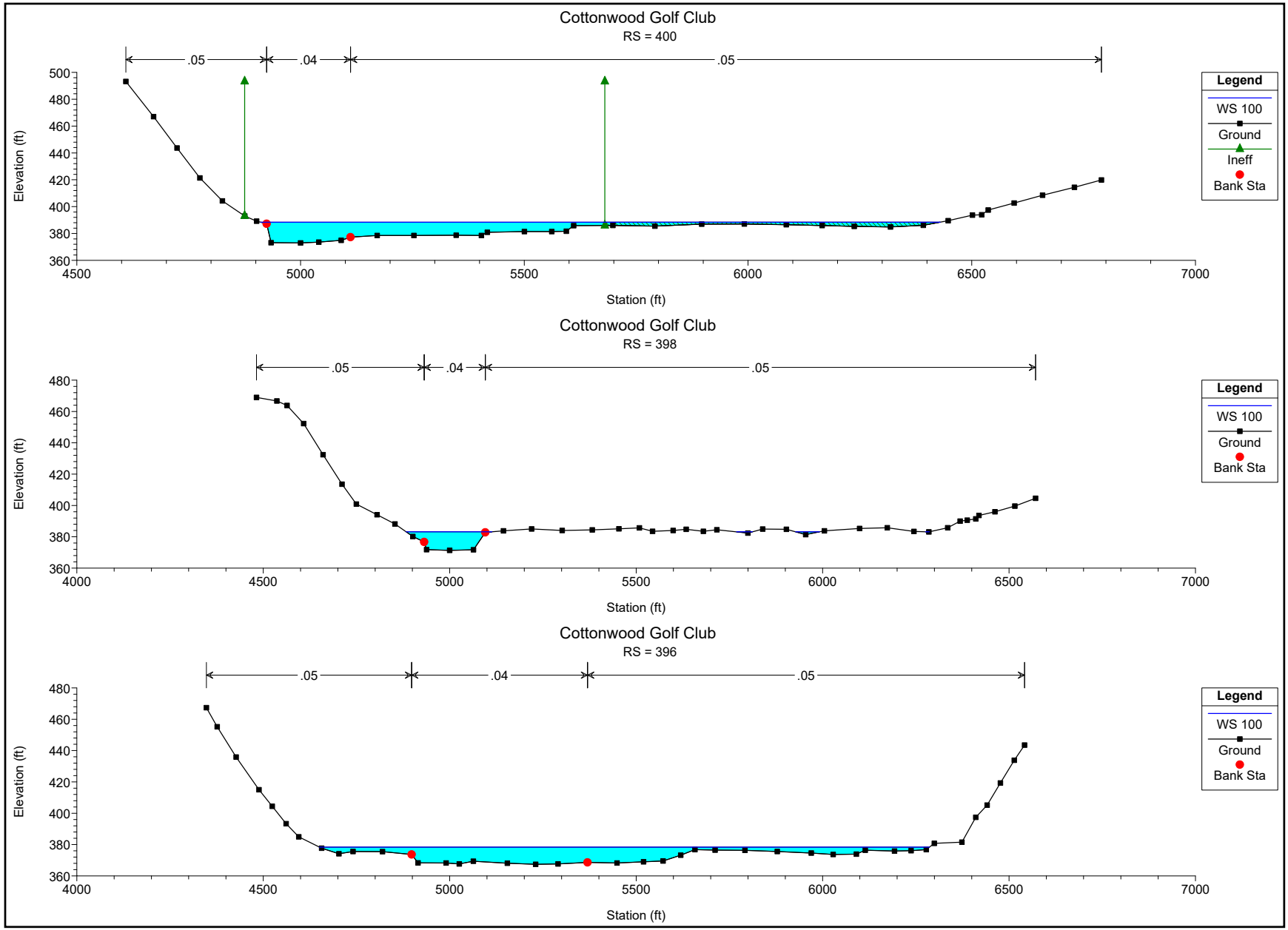
Rick Engineering As-Built Condition (Effective)

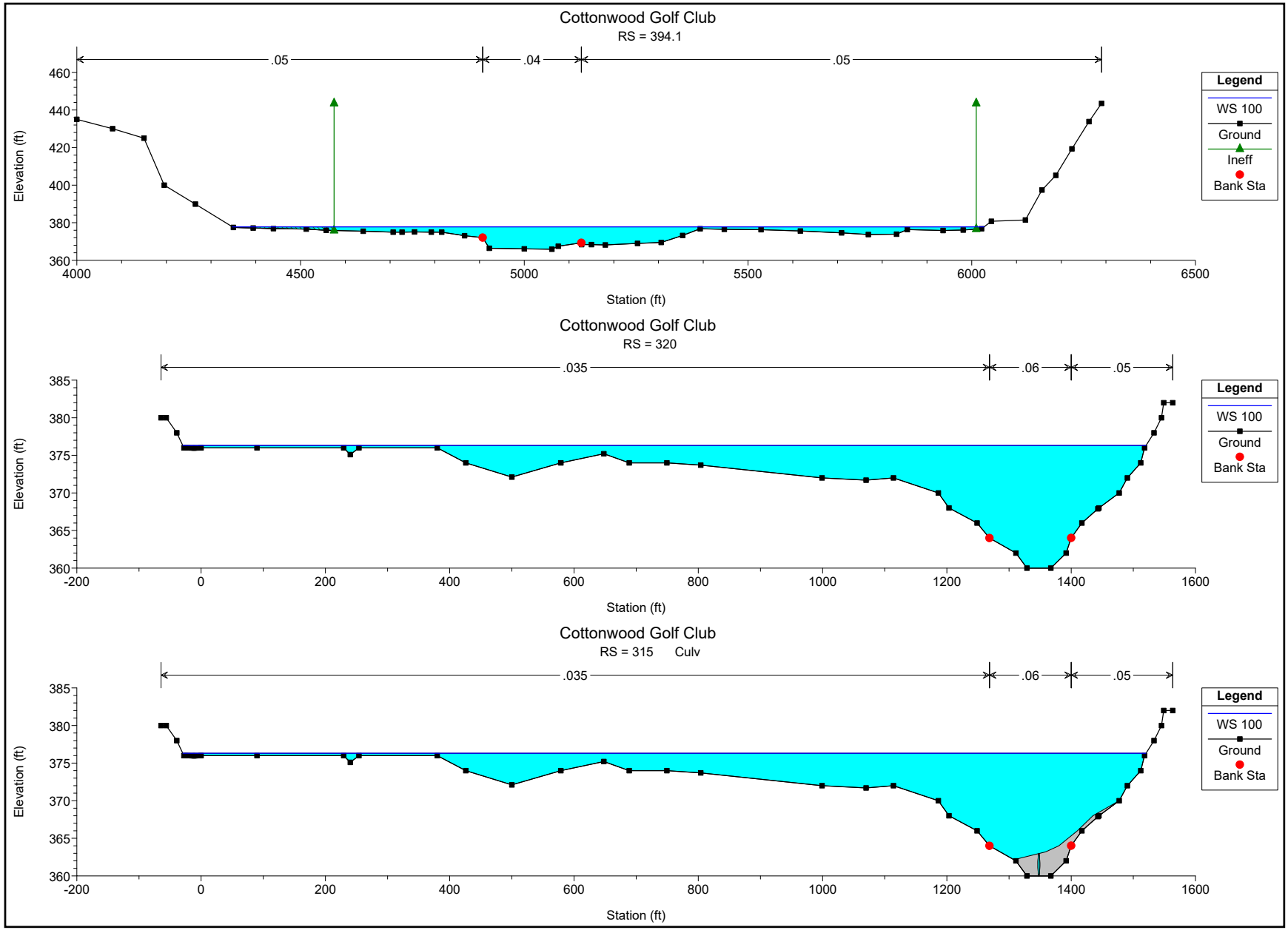
HEC-RAS Plan: Effective River: RIVER-1 Reach: Reach-1 Profile: 100

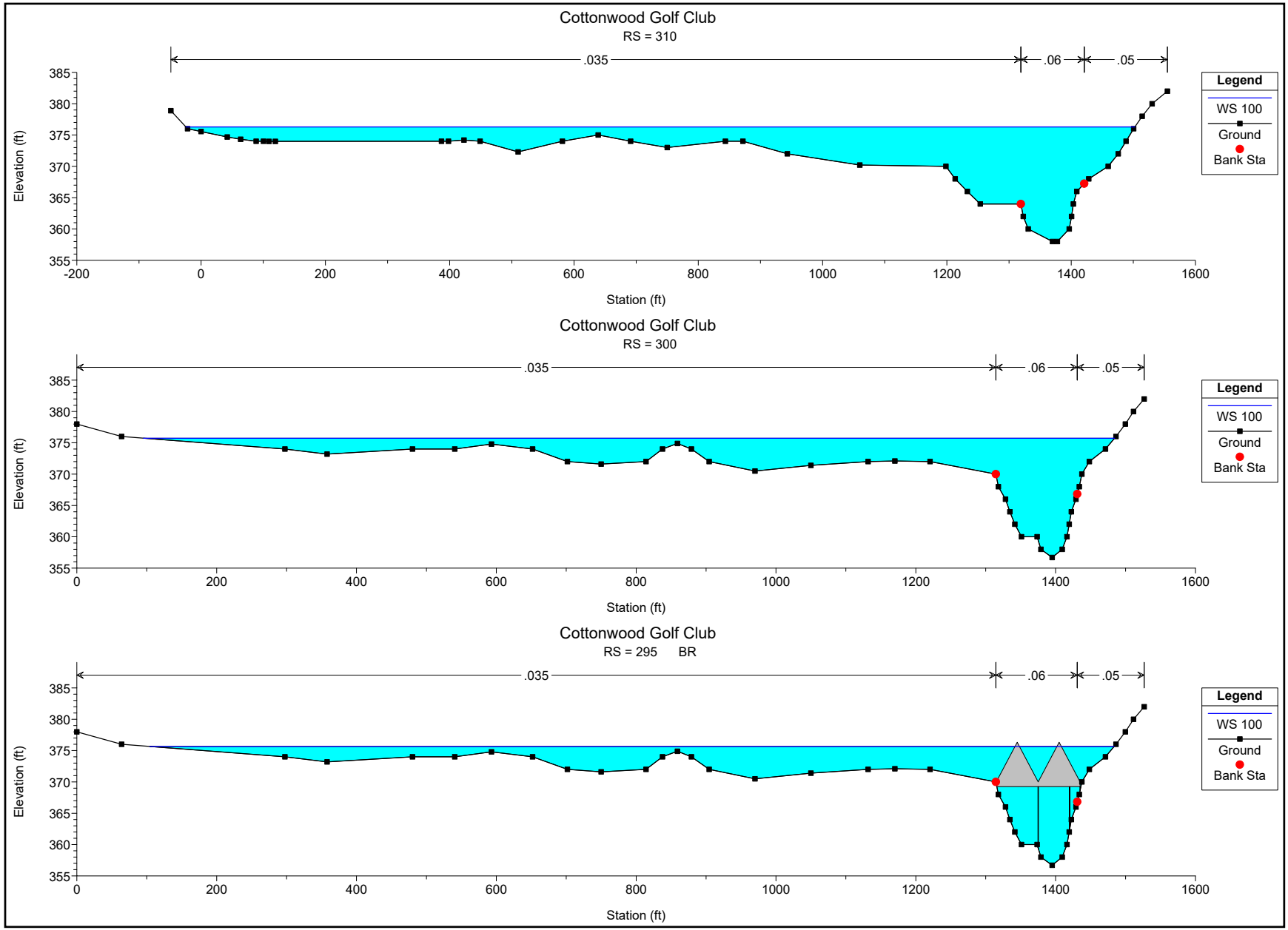
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	400	100	29500.00	373.00	388.40		388.73	0.000710	5.67	7217.89	1518.65	0.26
Reach-1	398	100	29500.00	371.30	383.17	383.17	387.25	0.008936	16.52	1955.33	346.72	0.90
Reach-1	396	100	29500.00	367.40	378.38		378.59	0.000584	4.20	9721.64	1635.84	0.23
Reach-1	394.1	100	29500.00	365.90	377.81		378.32	0.001542	7.14	6838.40	1679.65	0.38
Reach-1	320	100	29500.00	360.00	376.30	371.89	376.73	0.001952	6.59	6279.85	1549.75	0.30
Reach-1	315		Culvert									
Reach-1	310	100	29500.00	358.00	376.28		376.58	0.001332	5.57	7122.92	1526.89	0.25
Reach-1	300	100	29500.00	356.70	375.73	374.22	376.36	0.003004	7.94	5237.34	1389.14	0.37
Reach-1	295		Bridge									
Reach-1	290	100	29500.00	357.00	375.52		376.15	0.003116	8.26	5088.74	1311.24	0.37
Reach-1	280	100	29500.00	354.60	372.00	372.00	374.39	0.006896	15.00	2918.15	813.73	0.79
Reach-1	270	100	29500.00	351.30	370.66	370.66	372.55	0.002422	13.13	3851.40	1241.65	0.64
Reach-1	260	100	29500.00	349.90	367.90	367.90	369.70	0.002600	12.88	3797.93	1077.01	0.66
Reach-1	250	100	29500.00	347.70	365.55	364.94	366.98	0.001893	10.89	4095.02	981.89	0.56
Reach-1	245		Bridge									
Reach-1	240	100	29500.00	347.70	365.31	364.86	366.87	0.002054	11.27	3932.89	950.11	0.58
Reach-1	230	100	29500.00	346.00	364.67	363.81	366.22	0.001776	11.32	3984.29	1061.74	0.55
Reach-1	225		Bridge									
Reach-1	220	100	29500.00	346.00	363.65	363.65	365.86	0.002594	13.12	3294.18	896.67	0.66
Reach-1	210	100	29500.00	345.30	362.54	361.40	363.56	0.001345	9.77	5066.40	1143.45	0.48
Reach-1	205		Bridge									
Reach-1	200	100	29500.00	345.30	361.42	361.42	363.30	0.002438	12.49	3775.20	1032.94	0.64
Reach-1	190	100	29500.00	343.70	359.56	359.56	361.51	0.002915	12.91	3651.46	1022.27	0.69
Reach-1	180	100	29500.00	342.80	356.18	356.18	357.72	0.003876	12.86	3862.30	1116.68	0.77
Reach-1	170	100	29500.00	342.10	354.53	354.06	355.68	0.003014	11.51	4697.07	1191.20	0.68
Reach-1	165		Bridge									
Reach-1	160	100	29500.00	342.10	353.77	353.77	355.38	0.004551	13.38	3963.11	1107.15	0.83
Reach-1	150	100	29500.00	340.70	351.69	351.69	353.25	0.004000	12.70	4463.50	1266.04	0.78
Reach-1	140	100	29500.00	340.00	349.31		349.71	0.000298	2.82	6252.03	999.31	0.20
Reach-1	130	100	29500.00	337.30	348.47	345.10	349.33	0.001370	7.64	4041.50	1122.41	0.46
Reach-1	125		Mult Open									
Reach-1	120	100	29500.00	338.10	346.46	346.46	348.93	0.007769	12.80	2359.45	982.82	1.01
Reach-1	110	100	29500.00	334.20	343.57		344.47	0.001252	6.06	4083.34	1011.17	0.42
Reach-1	100	100	29500.00	332.00	343.29		343.81	0.001243	7.38	5524.65	969.52	0.44
Reach-1	90	100	29500.00	329.50	342.31	340.97	343.05	0.001776	8.93	5077.04	1105.35	0.53
Reach-1	85		Bridge									
Reach-1	80	100	29500.00	329.40	341.24	341.24	342.84	0.003678	12.74	3817.31	1103.62	0.75
Reach-1	70	100	29500.00	327.60	339.40	339.27	340.78	0.003511	12.12	4076.96	1150.47	0.73

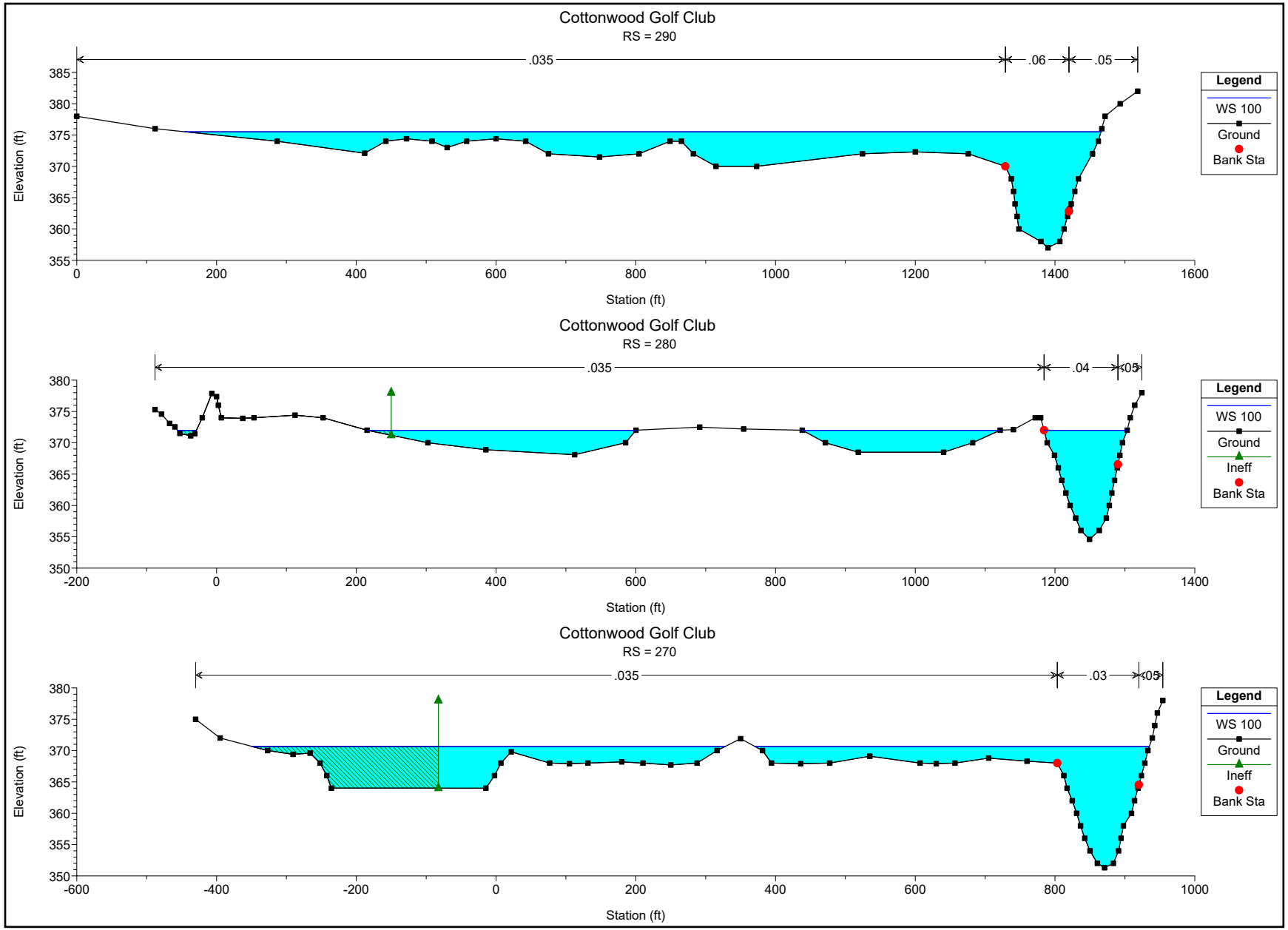
HEC-RAS Plan: Effective River: RIVER-1 Reach: Reach-1 Profile: 100 (Continued)

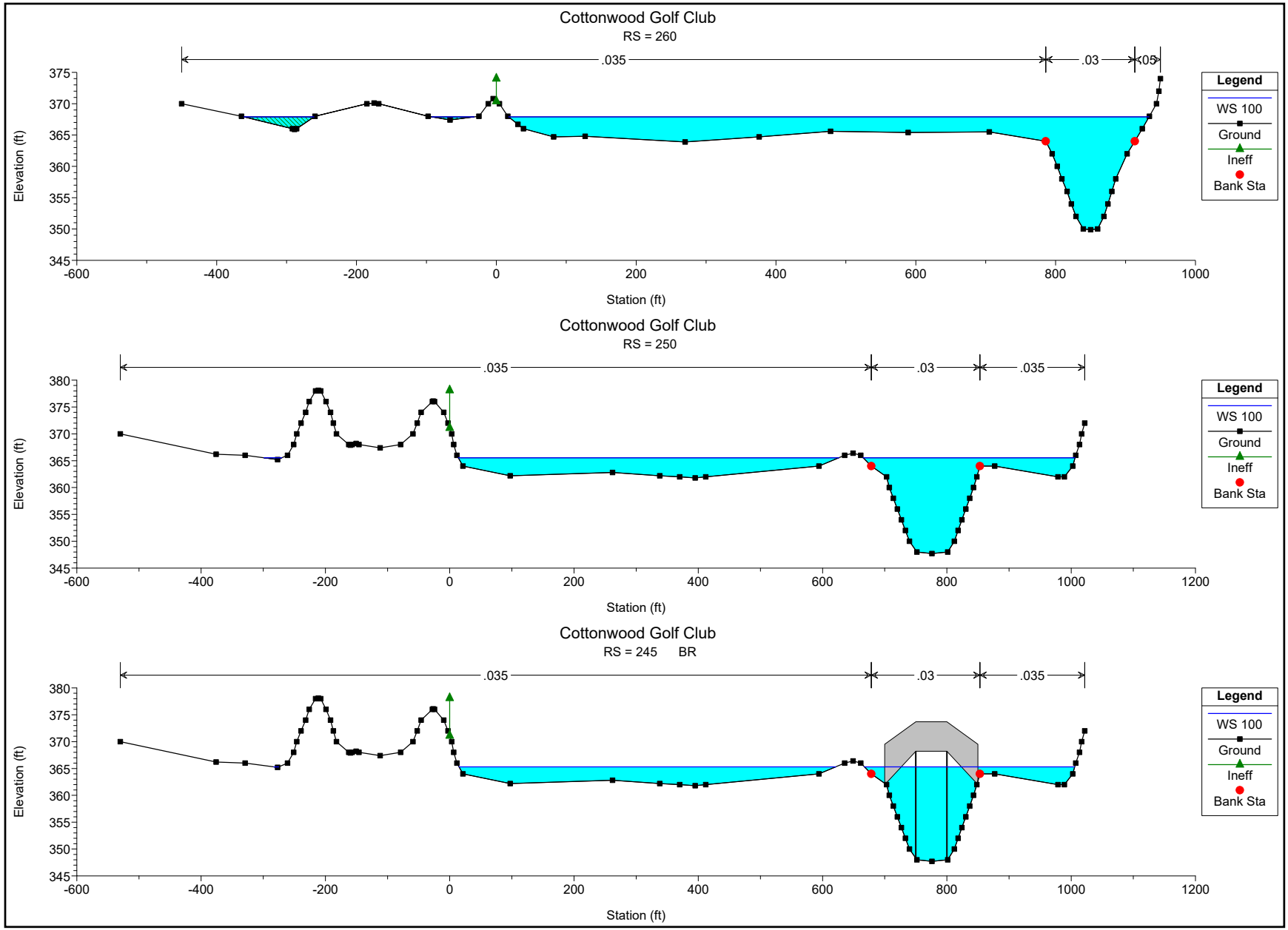
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	65		Bridge									
Reach-1	60	100	29500.00	327.10	339.14	339.14	340.64	0.003940	12.57	3873.52	1131.38	0.77
Reach-1	50	100	29500.00	325.40	337.58		337.98	0.002917	4.98	5819.82	1115.15	0.26
Reach-1	40	100	29500.00	324.50	336.13		336.59	0.002341	4.28	5713.12	1014.69	0.23
Reach-1	30	100	29500.00	323.60	335.13		335.48	0.001631	3.54	6621.18	1161.91	0.19
Reach-1	20	100	29500.00	323.00	333.90	331.66	334.44	0.002912	4.37	5163.59	1336.52	0.25
Reach-1	15		Bridge									
Reach-1	10	100	29500.00	322.00	333.85	331.57	334.35	0.002739	4.22	5402.62	1248.54	0.25
Reach-1	5	100	29500.00	321.10	330.28	328.76	330.93	0.004294	10.82	5598.21	1123.72	0.68

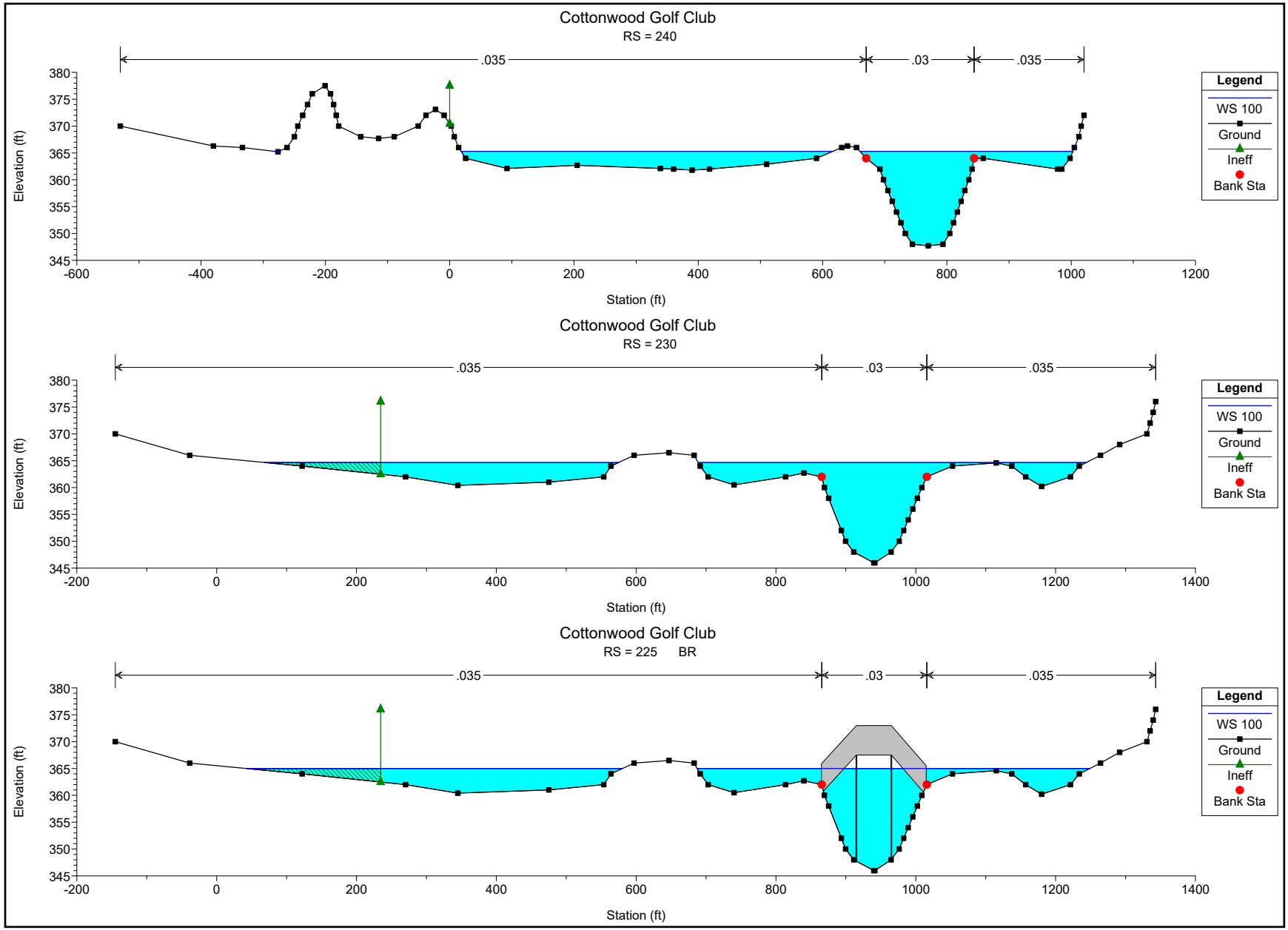

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.04
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WS 100
Ground
Ineff
Bank Sta
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.05
.04
.05
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
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Station (ft)
Legend
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Ground
Bank Sta

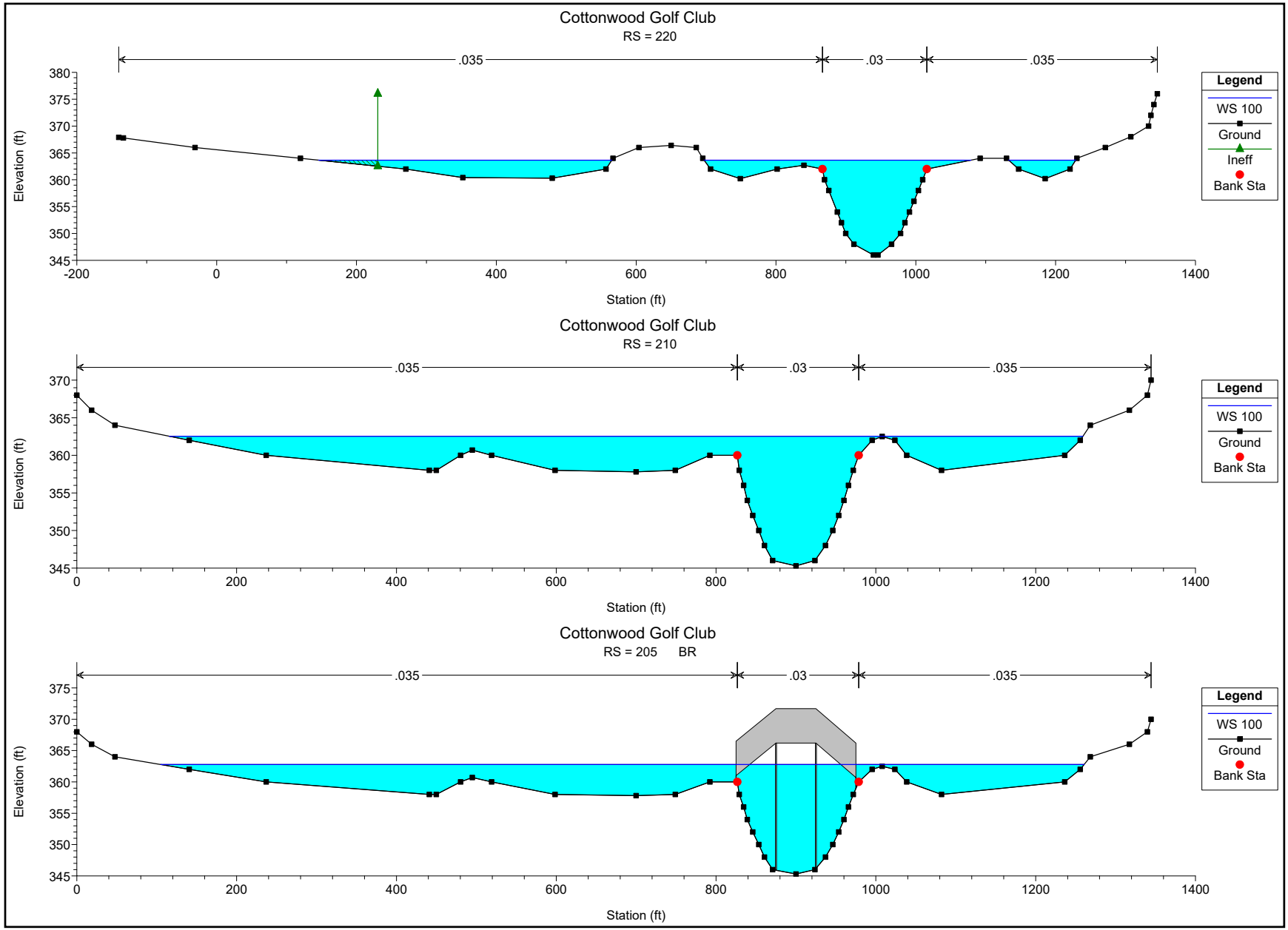

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Ineff
Bank Sta
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800
1000
1200
1400
1600
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
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.06
.05
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Station (ft)
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Bank Sta

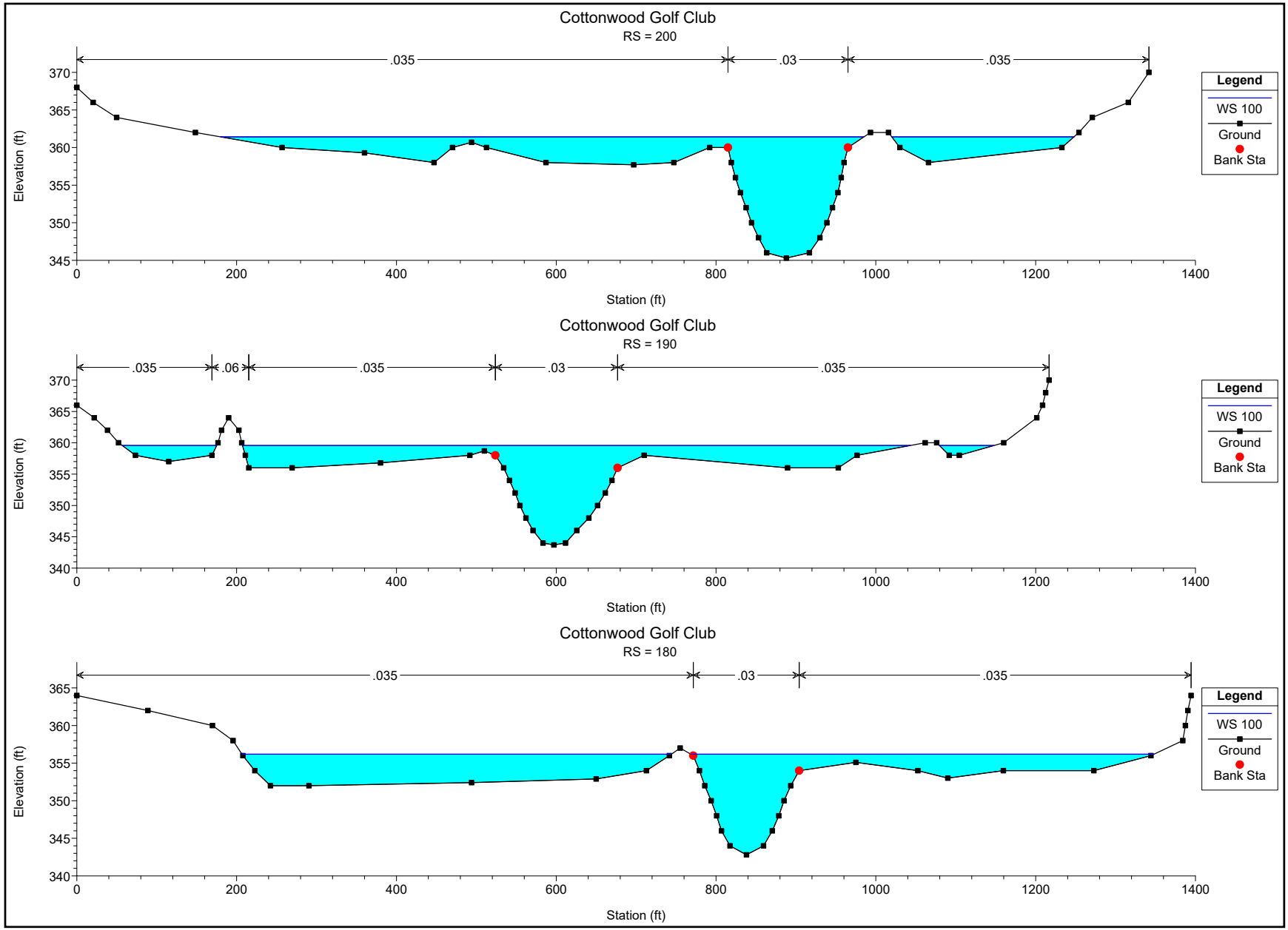

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600
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1000
1200
1400
1600
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
RS = 300
.035
.06
.05
Elevation (ft)
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380
375
370
365
360
355
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400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
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.06
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Elevation (ft)
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1400
1600
Station (ft)
Legend
WS 100
Ground
Bank Sta

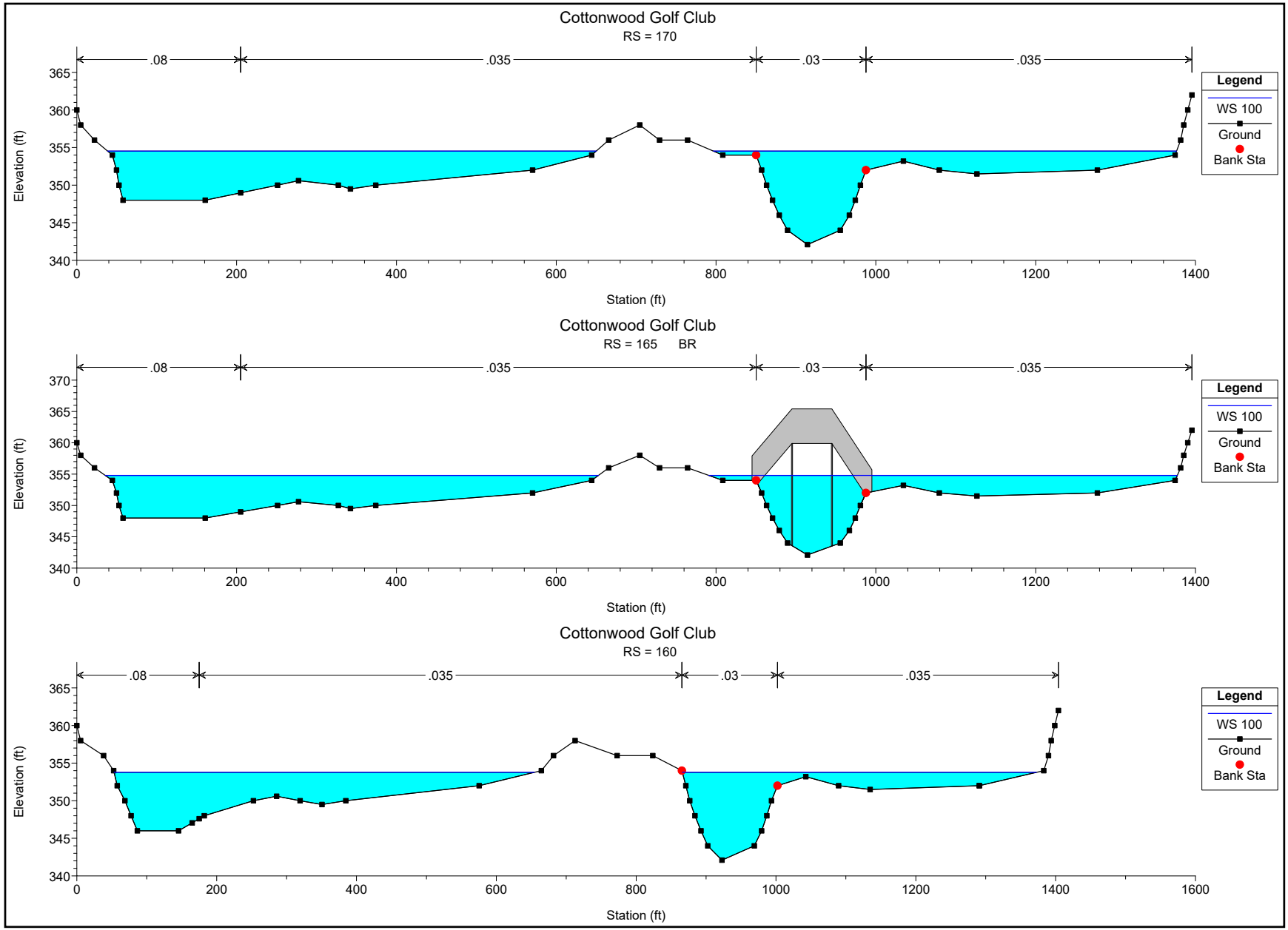

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1200
1400
1600
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
RS = 280
.035
.04
.05
Elevation (ft)
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365
360
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350
-200
0
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400
600
800
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1200
1400
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
Cottonwood Golf Club
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.035
.03
.05
Elevation (ft)
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375
370
365
360
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Bank Sta

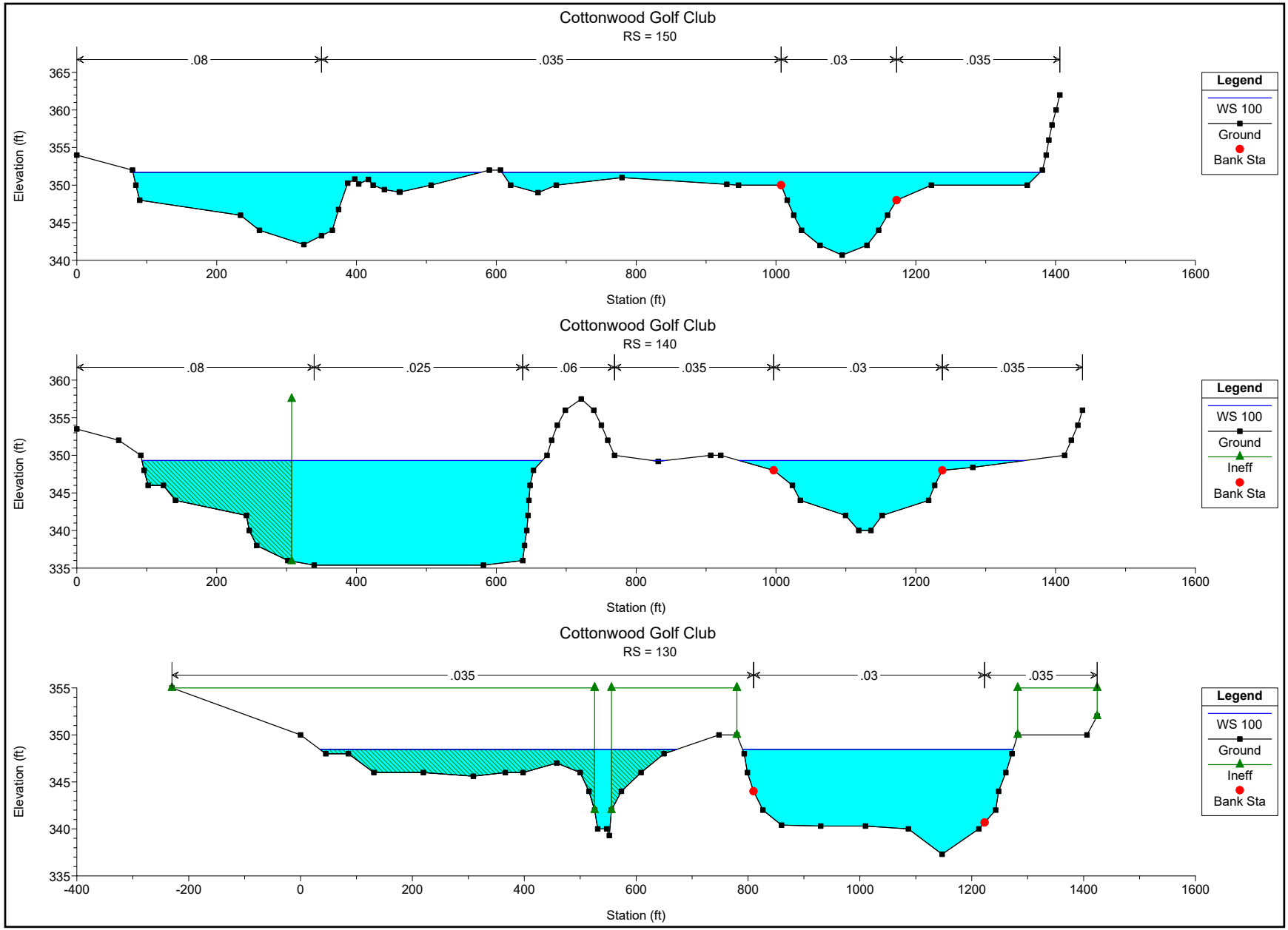

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Ground
Ineff
Bank Sta
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RS = 250
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
Cottonwood Golf Club
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.03
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Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta

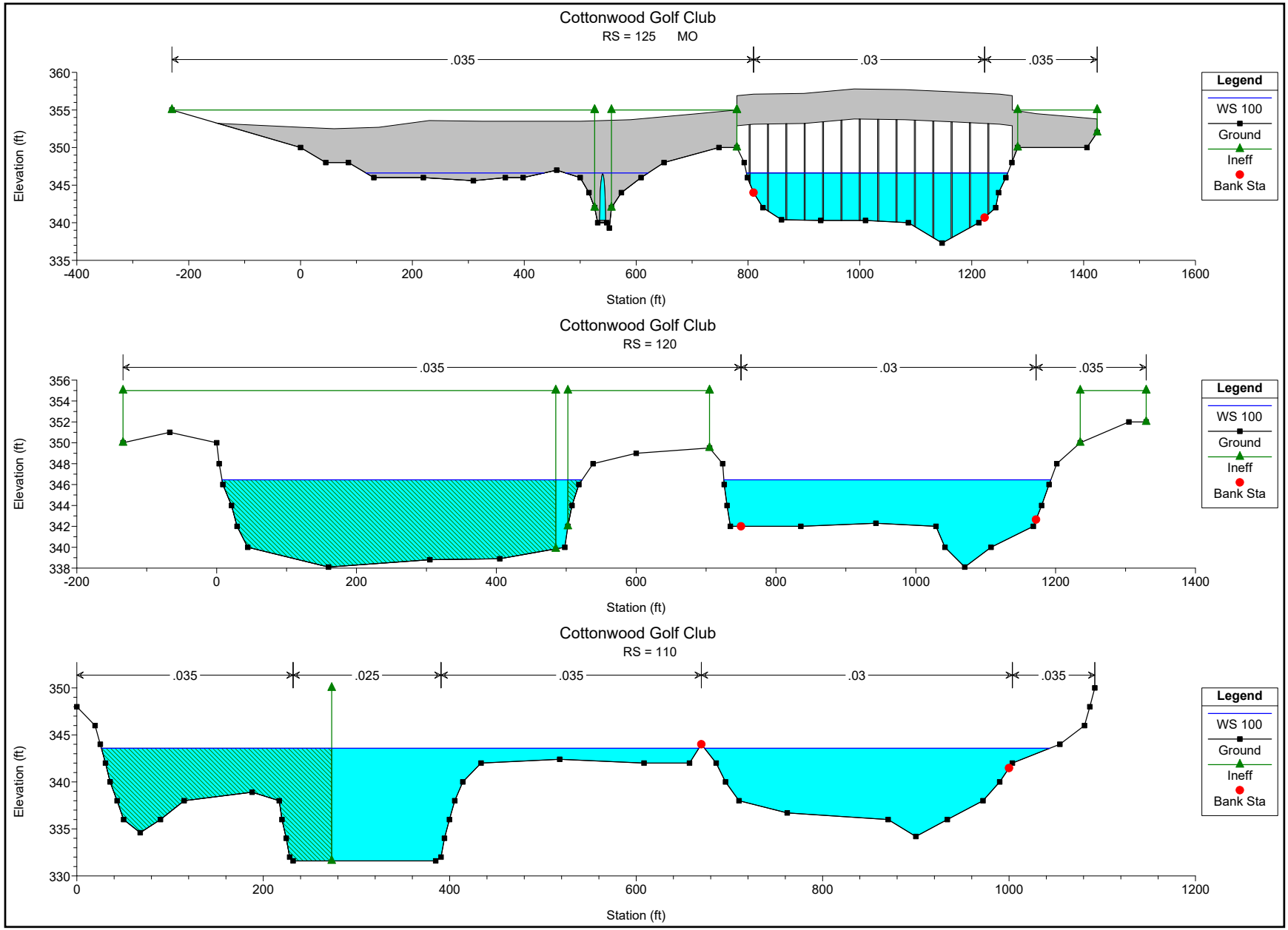

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Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 230
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
Cottonwood Golf Club
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.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta

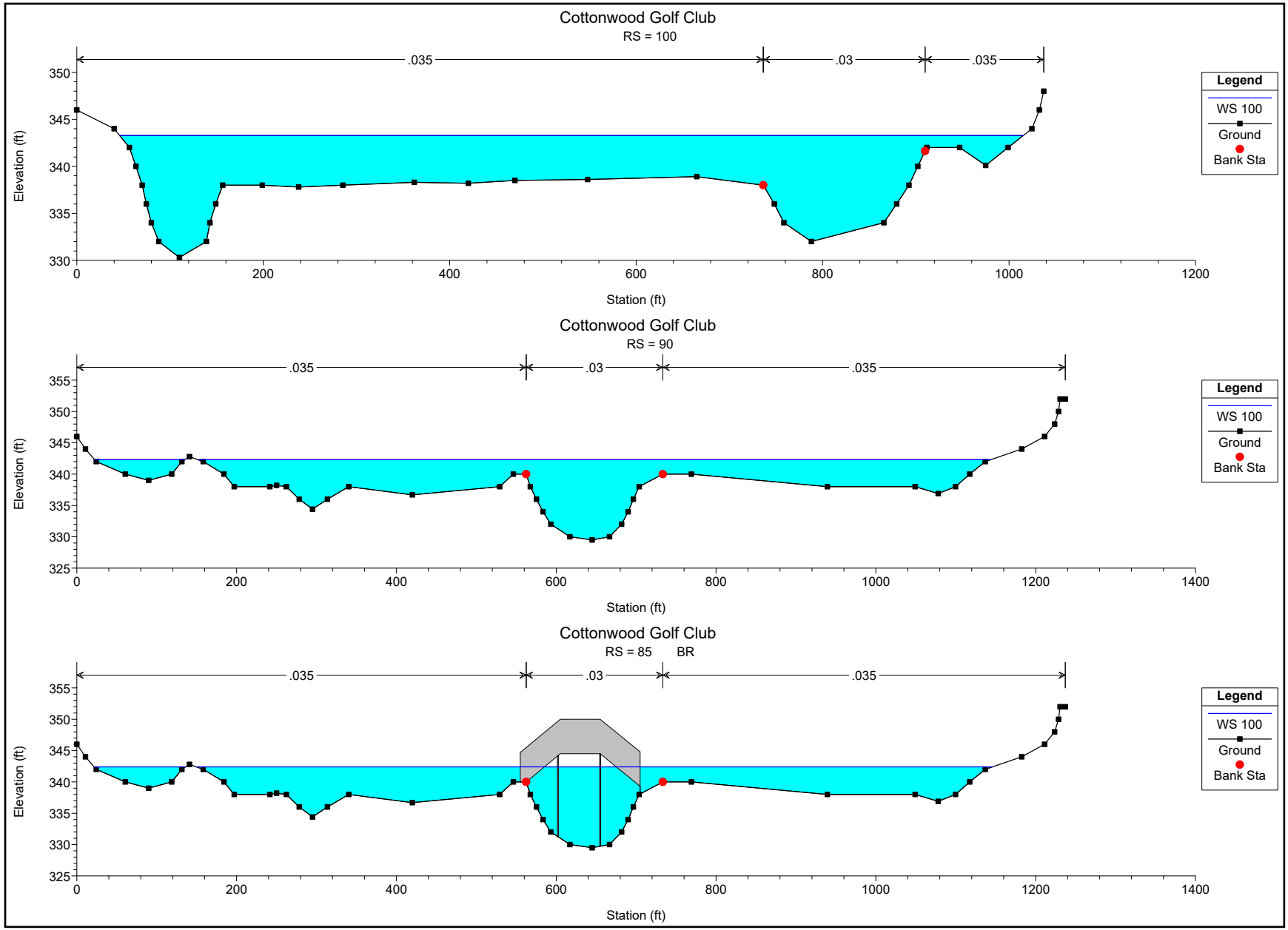

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Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 210
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
RS = 205 BR
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.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta

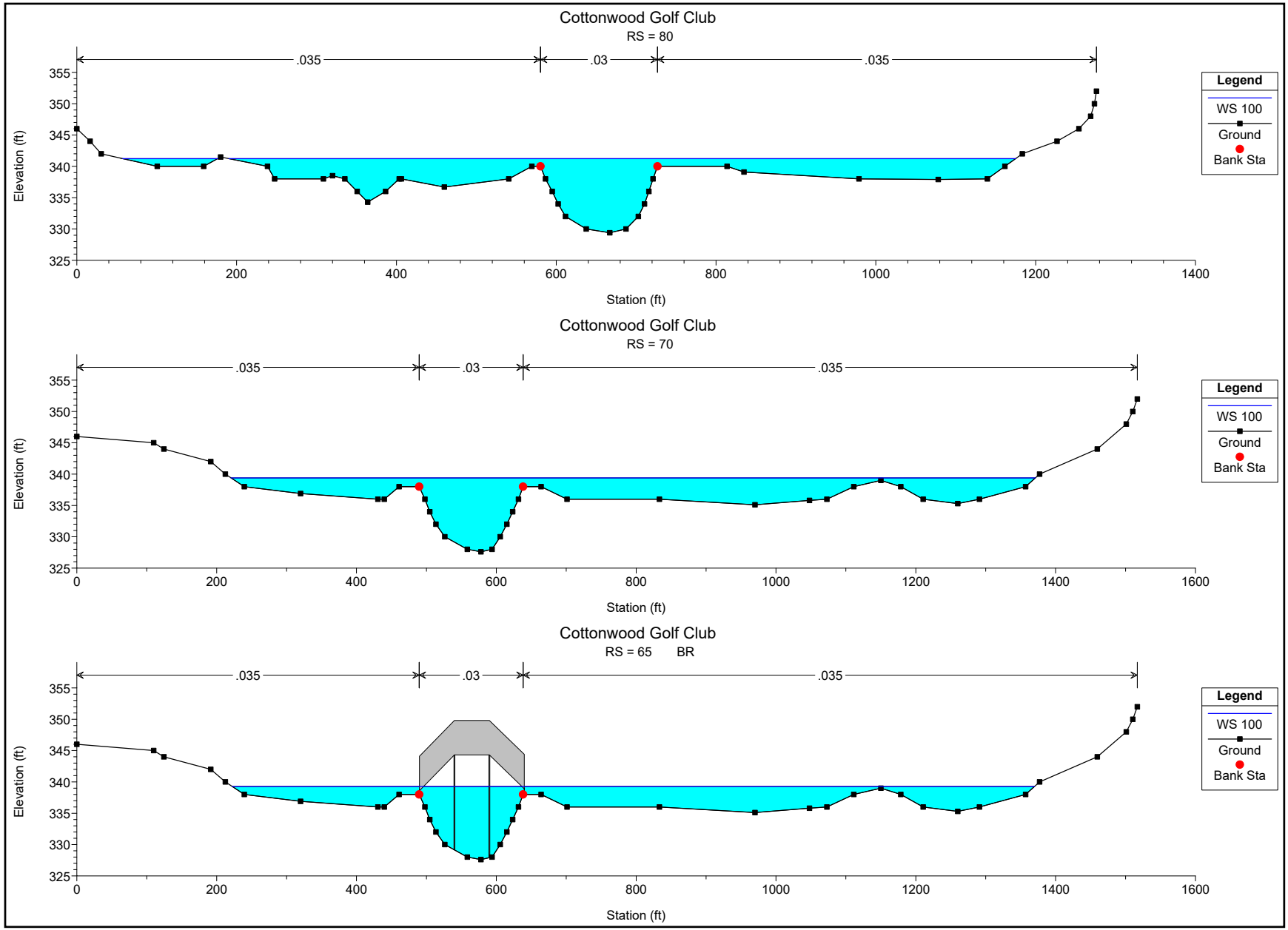

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400
600
800
1000
1200
1400
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
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.06
.035
.03
.035
Elevation (ft)
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355
350
345
340
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200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
RS = 180
.035
.03
.035
Elevation (ft)
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 100
Ground
Bank Sta

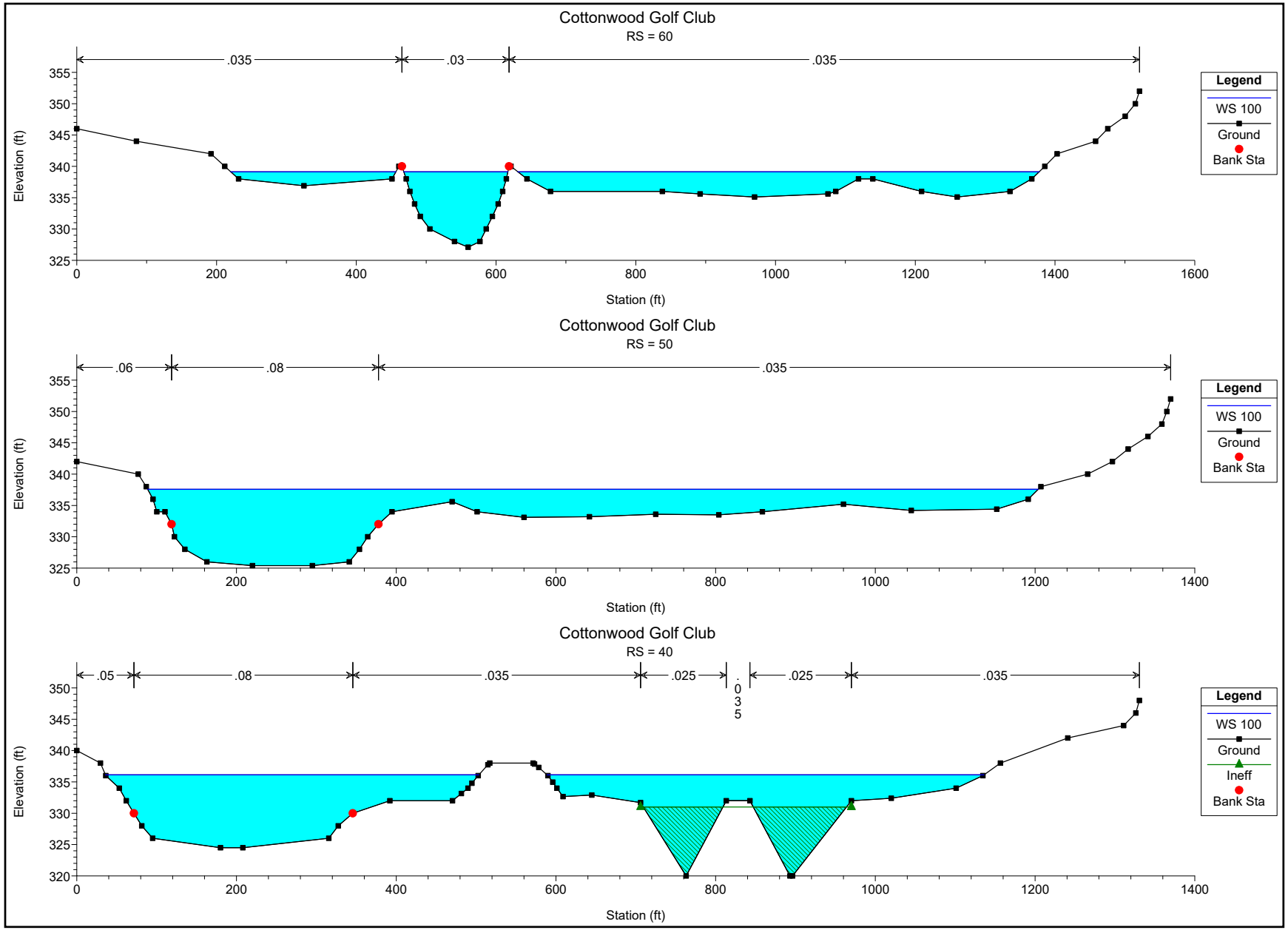

Cottonwood Golf Club
RS = 170
.08
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
RS = 165 BR
.08
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
RS = 160
.08
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta

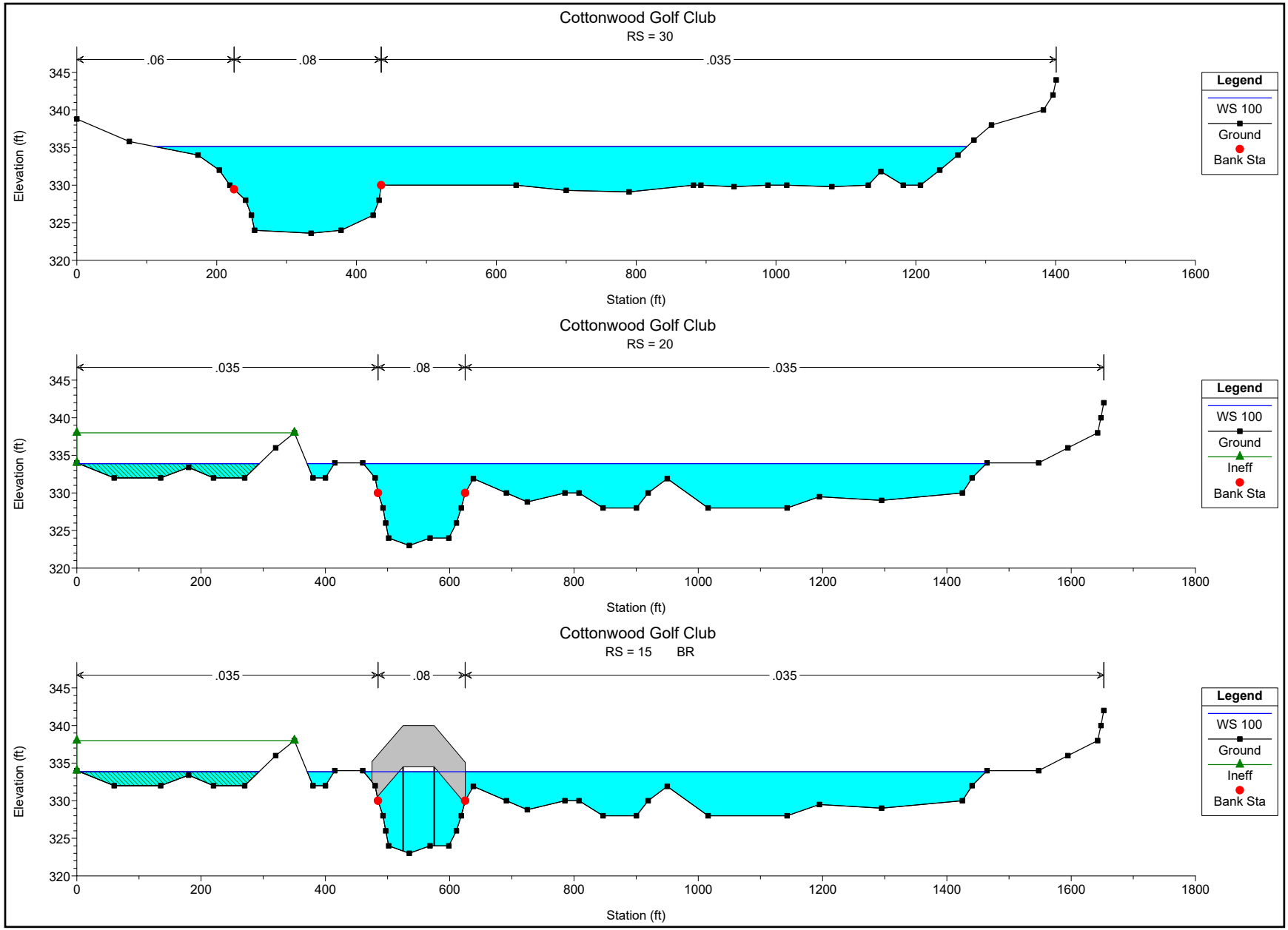

Cottonwood Golf Club
RS = 150
.08
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
RS = 140
.08
.025
.06
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 130
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta

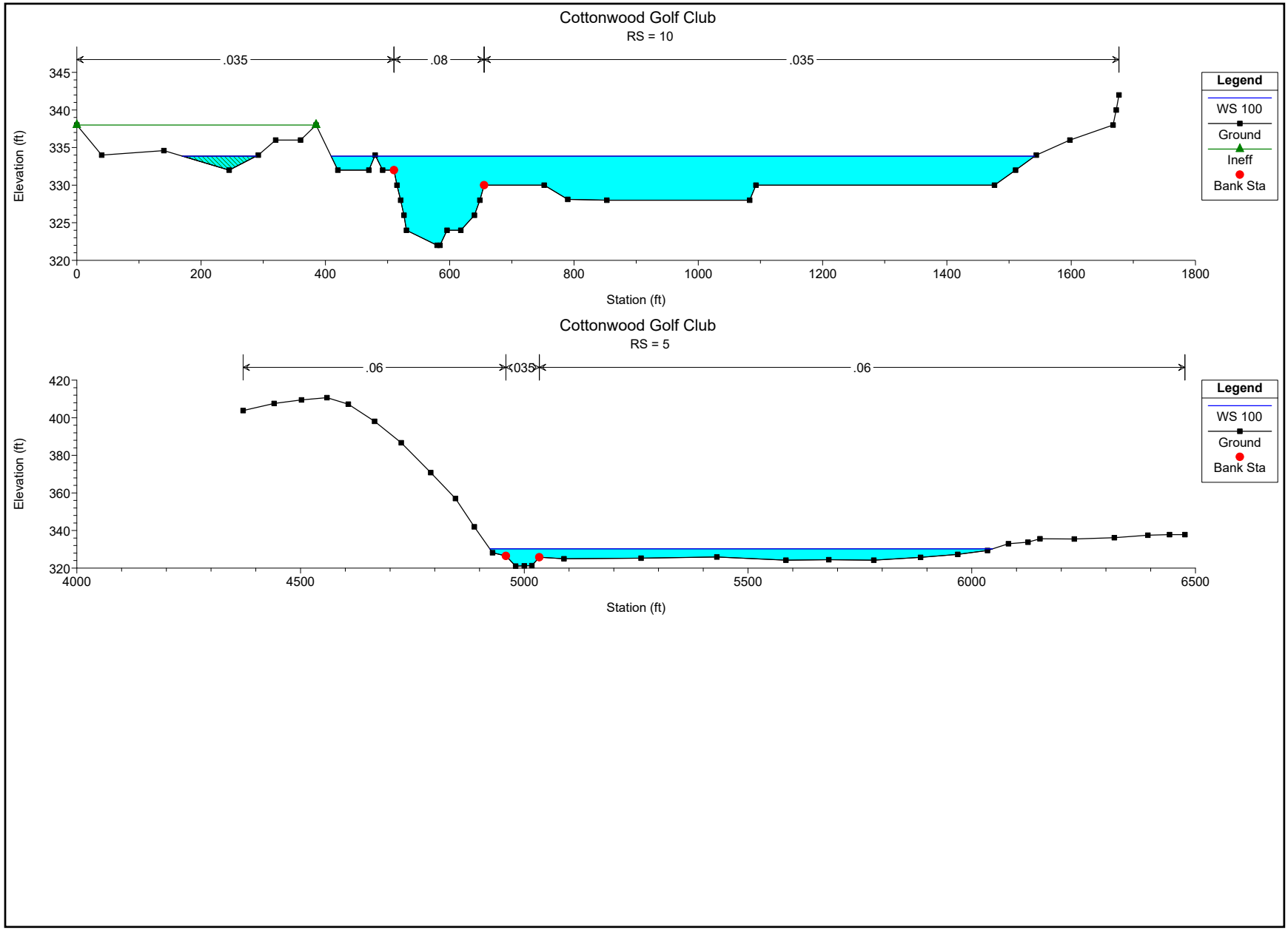

Cottonwood Golf Club
RS = 125 MO
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 120
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 110
.035
.025
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta


Cottonwood Golf Club
RS = 100
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
RS = 90
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
RS = 85 BR
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta


Cottonwood Golf Club
RS = 80
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
RS = 70
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
RS = 65 BR
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta


Cottonwood Golf Club
RS = 60
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
RS = 50
.06
.08
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
RS = 40
.05
.08
.035
.025
.035
.025
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta


Cottonwood Golf Club
RS = 30
.06
.08
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
Cottonwood Golf Club
RS = 20
.035
.08
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 15 BR
.035
.08
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta


Cottonwood Golf Club
RS = 10
.035
.08
.035
Elevation (ft)
345
340
335
330
325
320
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 5
.06
.035
.06
Elevation (ft)
420
400
380
360
340
320
4000
4500
5000
5500
6000
6500
Station (ft)
Legend
WS 100
Ground
Bank Sta

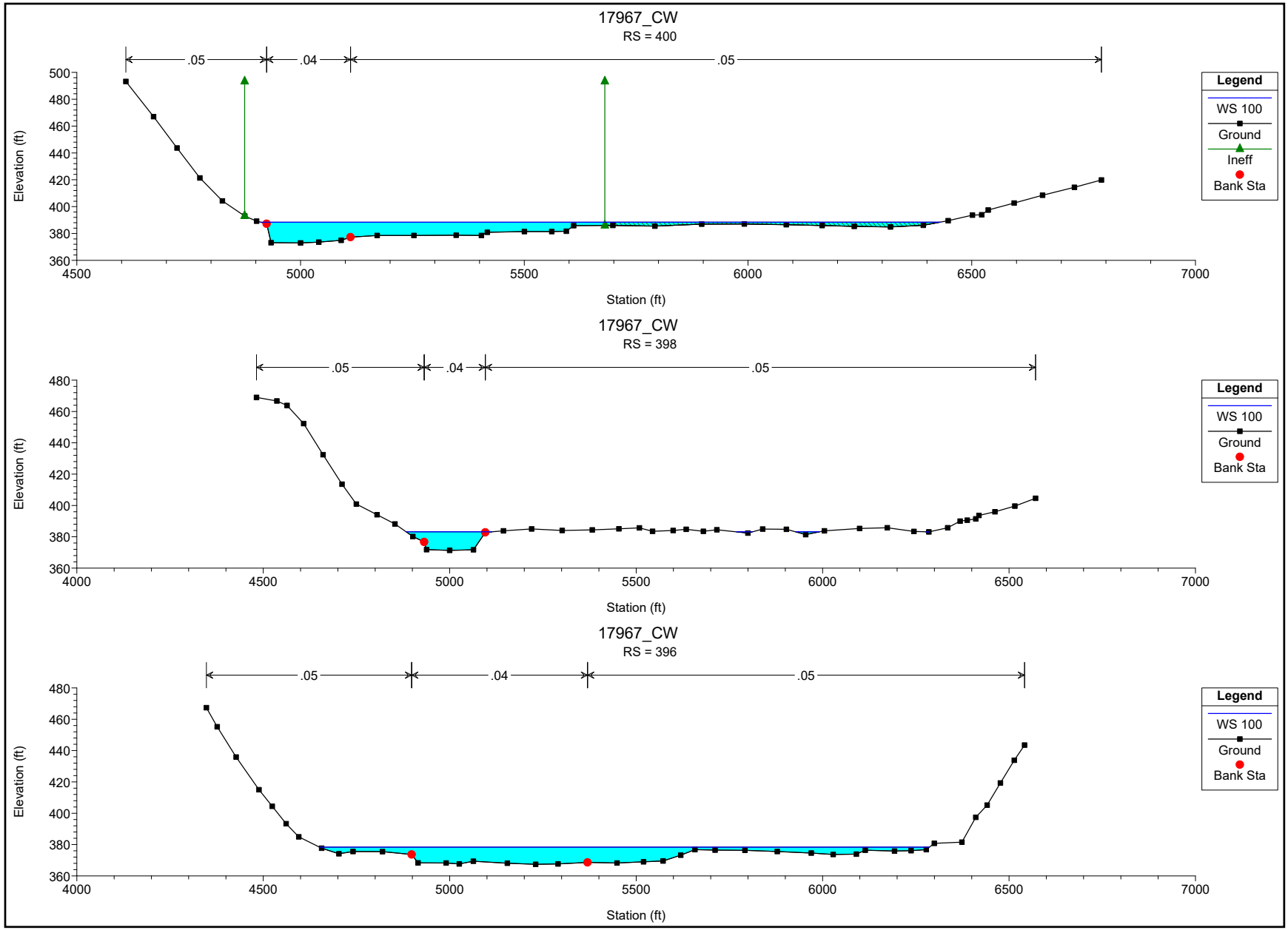
Existing Condition (Corrected Effective)

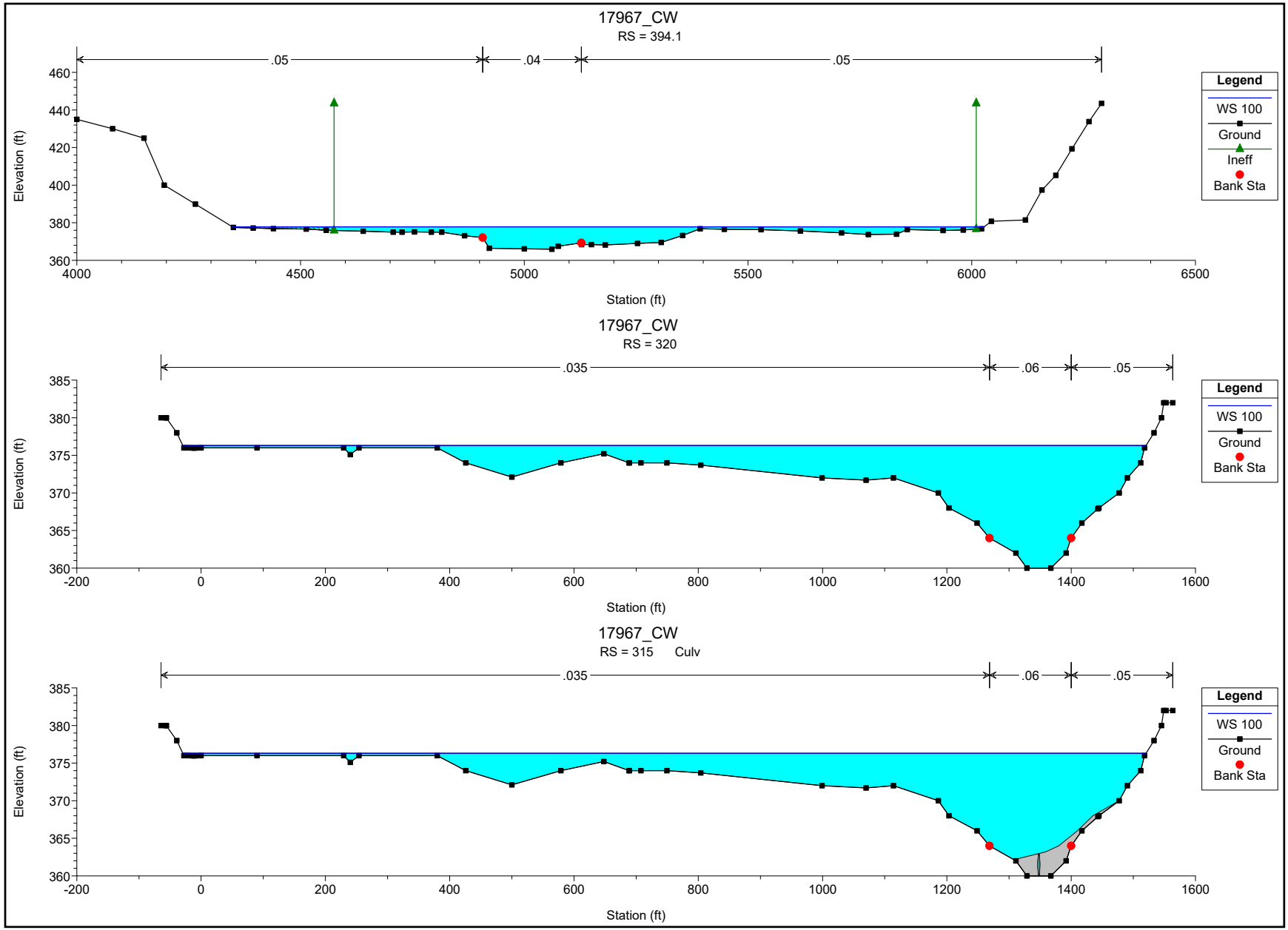
HEC-RAS Plan: As-Built Corr Eff River: RIVER-1 Reach: Reach-1 Profile: 100

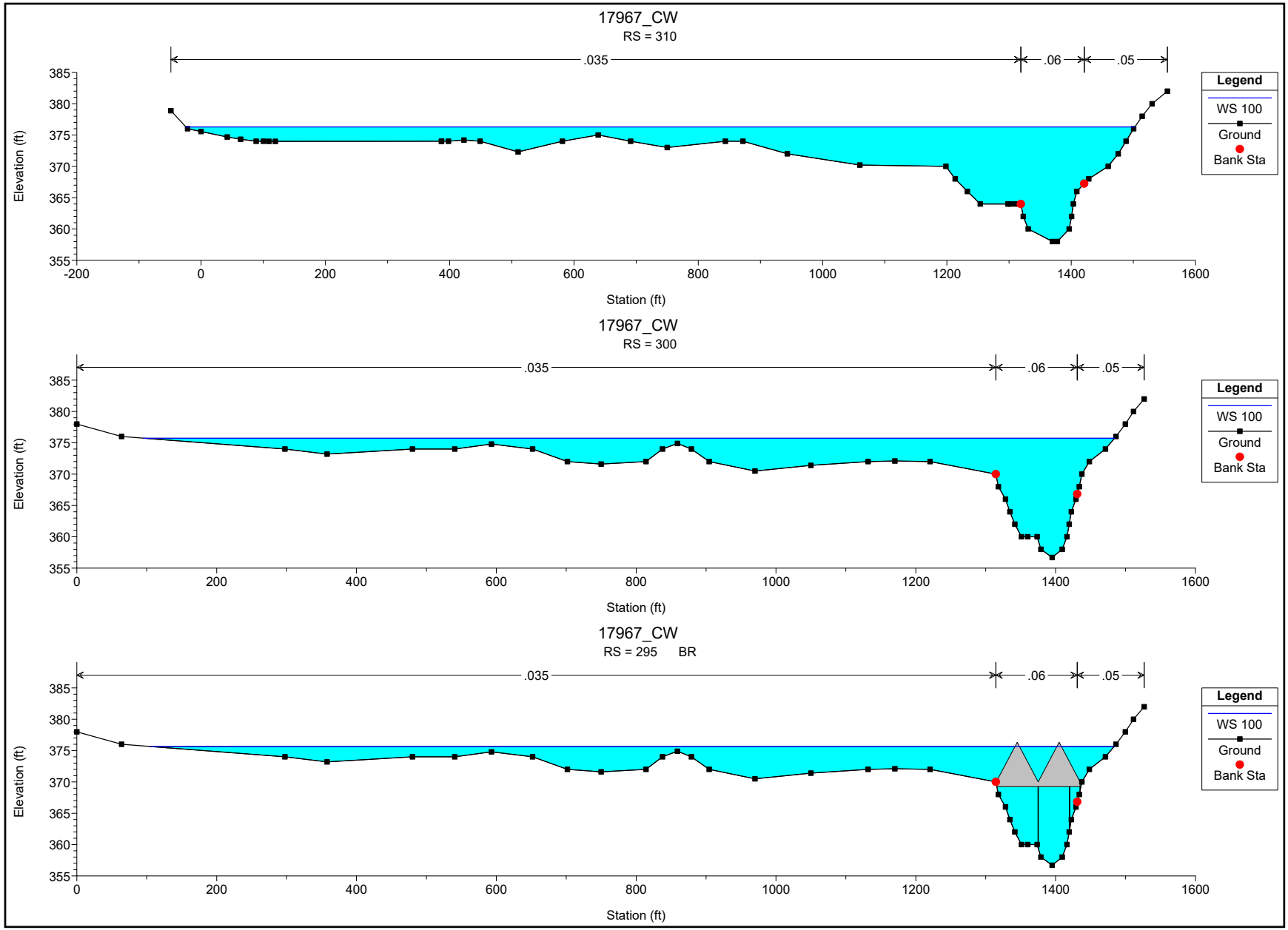
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	400	100	29500.00	373.00	388.40		388.73	0.000710	5.67	7217.89	1518.65	0.26
Reach-1	398	100	29500.00	371.30	383.17	383.17	387.25	0.008936	16.52	1955.33	346.72	0.90
Reach-1	396	100	29500.00	367.40	378.38		378.59	0.000584	4.20	9721.67	1635.85	0.23
Reach-1	394.1	100	29500.00	365.90	377.81		378.32	0.001542	7.14	6838.40	1679.65	0.38
Reach-1	320	100	29500.00	360.00	376.30	371.89	376.73	0.001952	6.59	6279.88	1549.75	0.30
Reach-1	315		Culvert									
Reach-1	310	100	29500.00	358.00	376.28		376.58	0.001332	5.57	7123.00	1526.89	0.25
Reach-1	300	100	29500.00	356.70	375.73	374.22	376.36	0.003003	7.94	5237.41	1389.15	0.37
Reach-1	295		Bridge									
Reach-1	290	100	29500.00	357.00	375.52		376.15	0.003116	8.26	5088.77	1311.24	0.37
Reach-1	280	100	29500.00	354.60	372.00	372.00	374.39	0.006896	15.00	2918.15	813.73	0.79
Reach-1	270	100	29500.00	351.30	370.66	370.66	372.55	0.002422	13.13	3851.40	1241.65	0.64
Reach-1	260	100	29500.00	349.90	367.90	367.90	369.70	0.002600	12.88	3797.93	1077.01	0.66
Reach-1	250	100	29500.00	347.70	365.55	364.94	366.98	0.001893	10.89	4095.02	981.89	0.56
Reach-1	245		Bridge									
Reach-1	240	100	29500.00	347.70	365.31	364.86	366.87	0.002054	11.27	3932.89	950.11	0.58
Reach-1	230	100	29500.00	346.00	364.67	363.81	366.22	0.001776	11.32	3984.29	1061.74	0.55
Reach-1	225		Bridge									
Reach-1	220	100	29500.00	346.00	363.65	363.65	365.86	0.002594	13.12	3294.18	896.67	0.66
Reach-1	210	100	29500.00	345.30	362.54	361.40	363.56	0.001345	9.77	5066.40	1143.45	0.48
Reach-1	205		Bridge									
Reach-1	200	100	29500.00	345.30	361.42	361.42	363.30	0.002438	12.49	3775.20	1032.94	0.64
Reach-1	190	100	29500.00	343.70	359.56	359.56	361.51	0.002915	12.91	3651.46	1022.27	0.69
Reach-1	180	100	29500.00	342.80	356.18	356.18	357.72	0.003876	12.86	3862.30	1116.68	0.77
Reach-1	170	100	29500.00	342.10	354.53	354.06	355.68	0.003014	11.51	4697.07	1191.20	0.68
Reach-1	165		Bridge									
Reach-1	160	100	29500.00	342.10	353.77	353.77	355.38	0.004551	13.38	3963.11	1107.15	0.83
Reach-1	150	100	29500.00	340.70	351.69	351.69	353.25	0.004000	12.70	4463.50	1266.04	0.78
Reach-1	140	100	29500.00	340.00	349.55		349.76	0.000298	2.90	8066.88	1072.12	0.20
Reach-1	130	100	29500.00	337.30	348.47	345.10	349.33	0.001370	7.64	4041.50	1122.41	0.46
Reach-1	125		Mult Open									
Reach-1	120	100	29500.00	338.10	346.46	346.46	348.93	0.007768	12.80	2359.51	982.82	1.01
Reach-1	110	100	29500.00	334.20	343.81		344.19	0.000582	4.22	6070.13	1021.10	0.29
Reach-1	100	100	29500.00	332.00	343.29		343.81	0.001243	7.38	5524.66	969.52	0.44
Reach-1	90	100	29500.00	329.50	342.31	340.97	343.05	0.001776	8.93	5077.04	1105.35	0.53
Reach-1	85		Bridge									
Reach-1	80	100	29500.00	329.40	341.24	341.24	342.84	0.003678	12.74	3817.31	1103.62	0.75
Reach-1	70	100	29500.00	327.60	339.40	339.27	340.78	0.003511	12.12	4076.96	1150.47	0.73

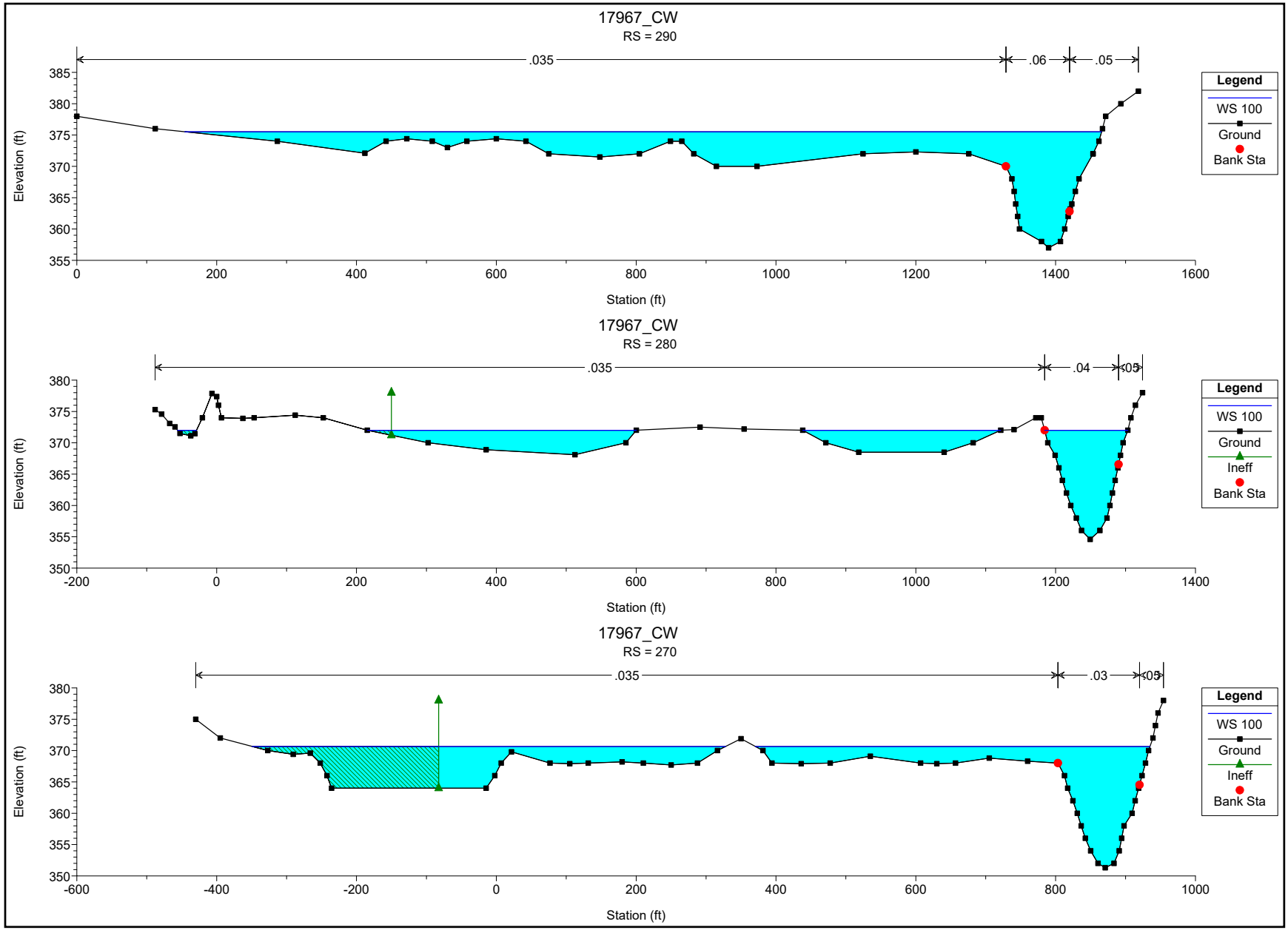
HEC-RAS Plan: As-Built Corr Eff River: RIVER-1 Reach: Reach-1 Profile: 100 (Continued)

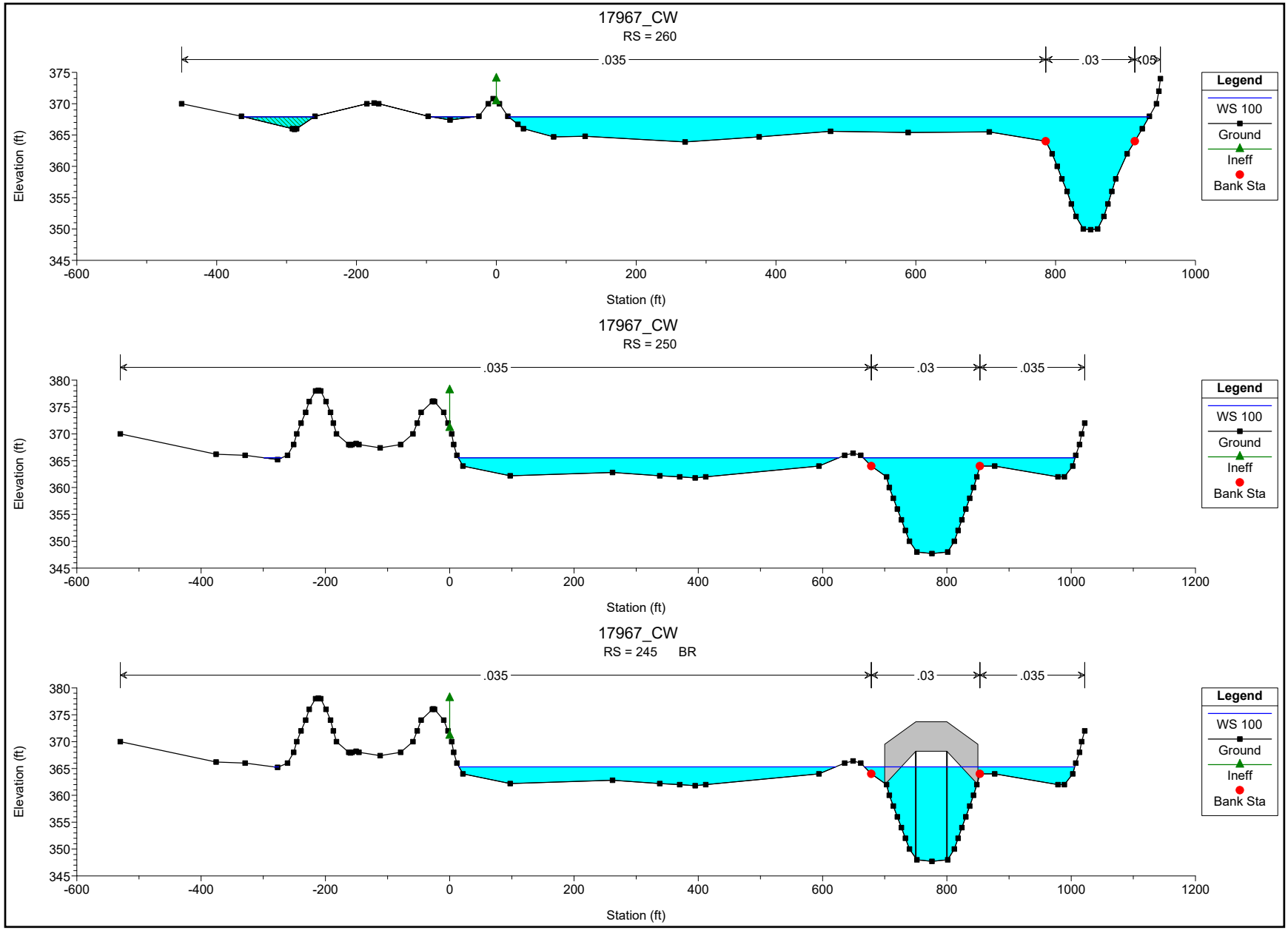
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	65		Bridge									
Reach-1	60	100	29500.00	327.10	339.14	339.14	340.64	0.003940	12.57	3873.52	1131.38	0.77
Reach-1	50	100	29500.00	325.40	337.58		337.98	0.002917	4.98	5819.82	1115.15	0.26
Reach-1	40	100	29500.00	324.50	336.13		336.59	0.002341	4.28	5713.12	1014.69	0.23
Reach-1	30	100	29500.00	323.60	335.13		335.48	0.001631	3.54	6621.18	1161.92	0.19
Reach-1	20	100	29500.00	323.00	333.90	331.66	334.44	0.002912	4.37	5163.59	1336.52	0.25
Reach-1	15		Bridge									
Reach-1	10	100	29500.00	322.00	333.85	331.57	334.35	0.002739	4.22	5402.62	1248.54	0.25
Reach-1	5	100	29500.00	321.10	330.28	328.76	330.93	0.004294	10.82	5598.21	1123.72	0.68

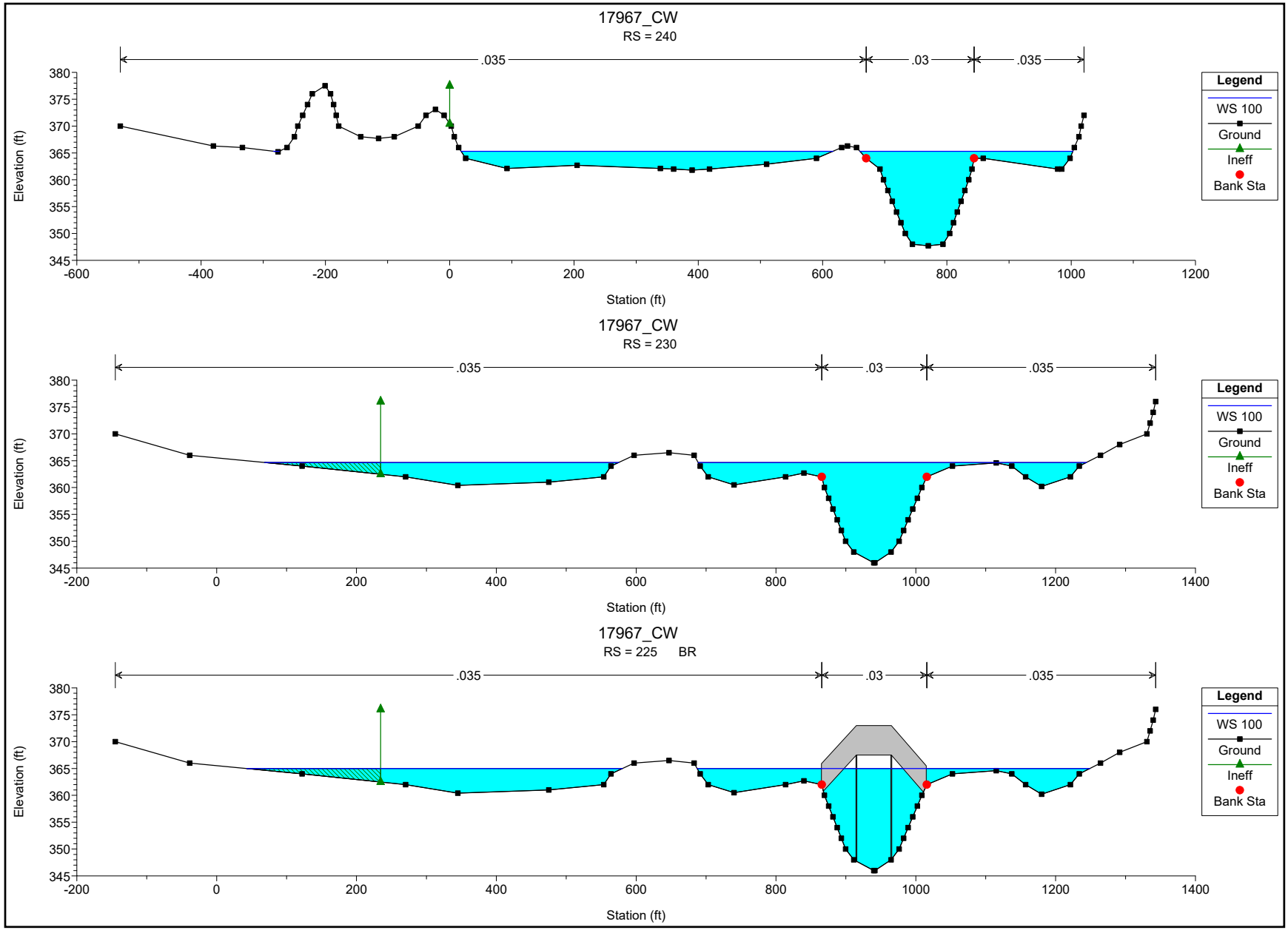

17967_CW
RS = 400
.05
.04
.05
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
17967_CW
RS = 398
.05
.04
.05
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 396
.05
.04
.05
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta

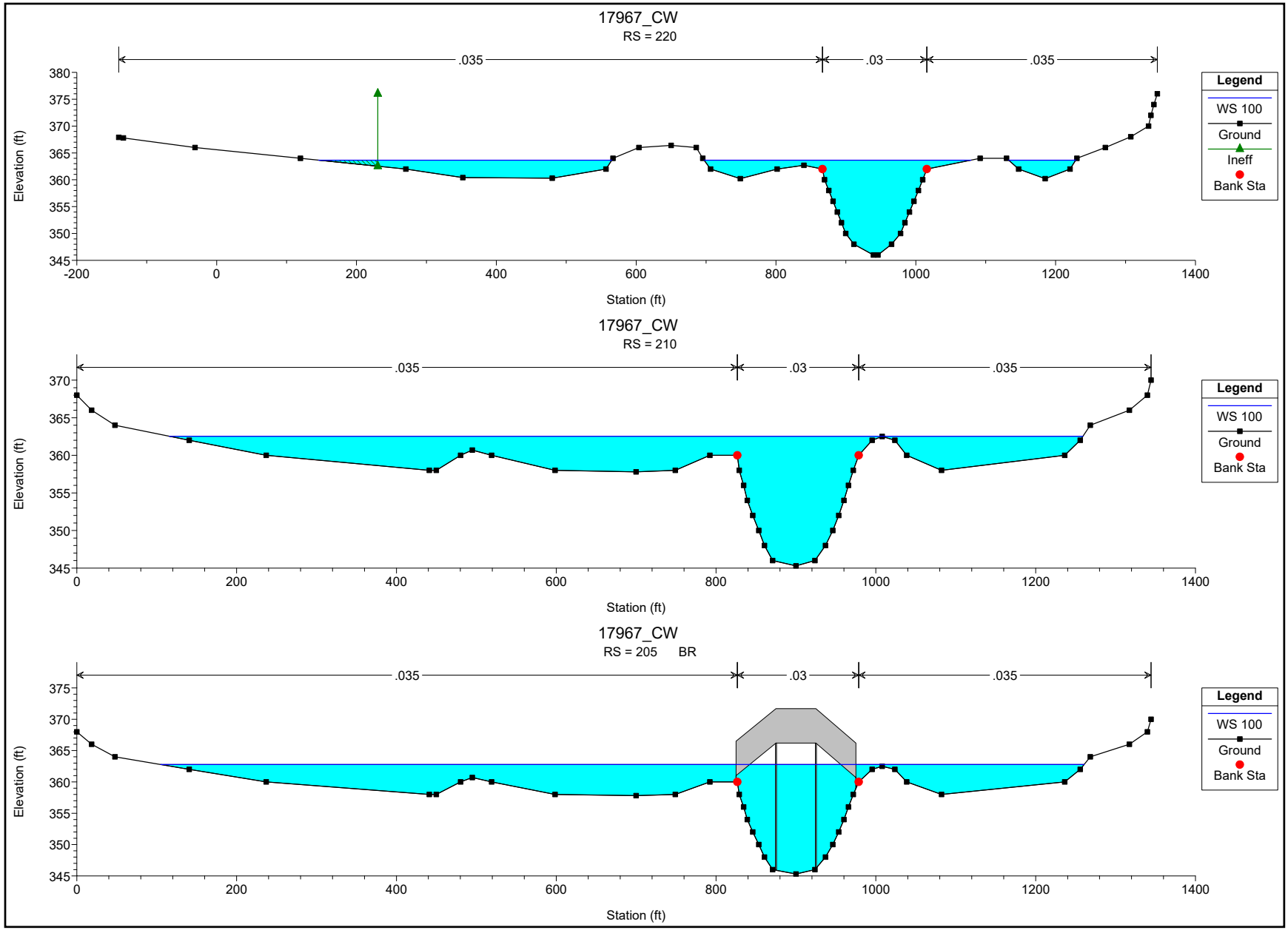

17967_CW
RS = 394.1
.05
.04
.05
Elevation (ft)
460
440
420
400
380
360
4000
4500
5000
5500
6000
6500
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
17967_CW
RS = 320
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
-200
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 315 Culv
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
-200
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 100
Ground
Bank Sta

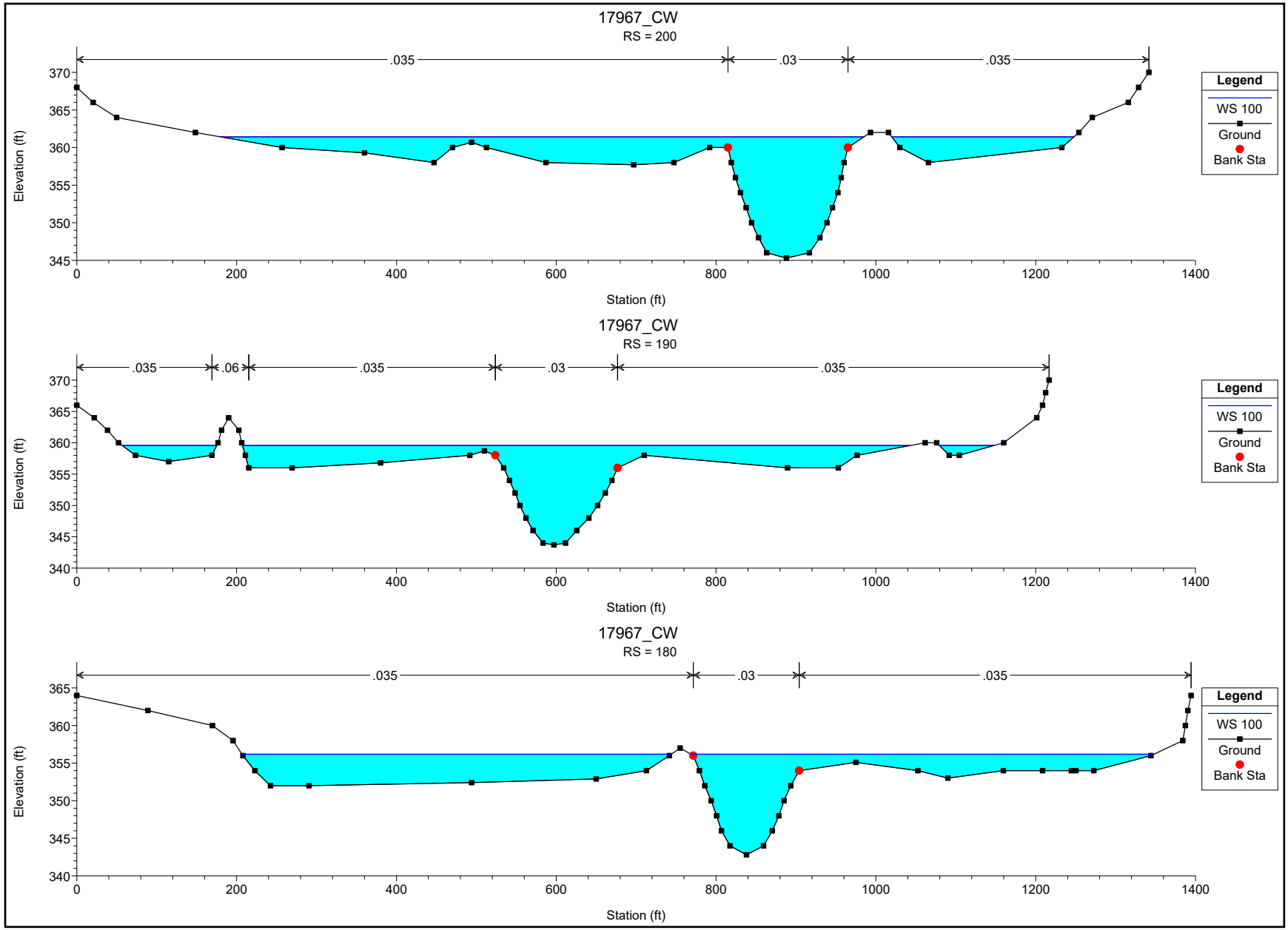

17967_CW
RS = 310
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
355
-200
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 300
.035
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 295 BR
.035
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta

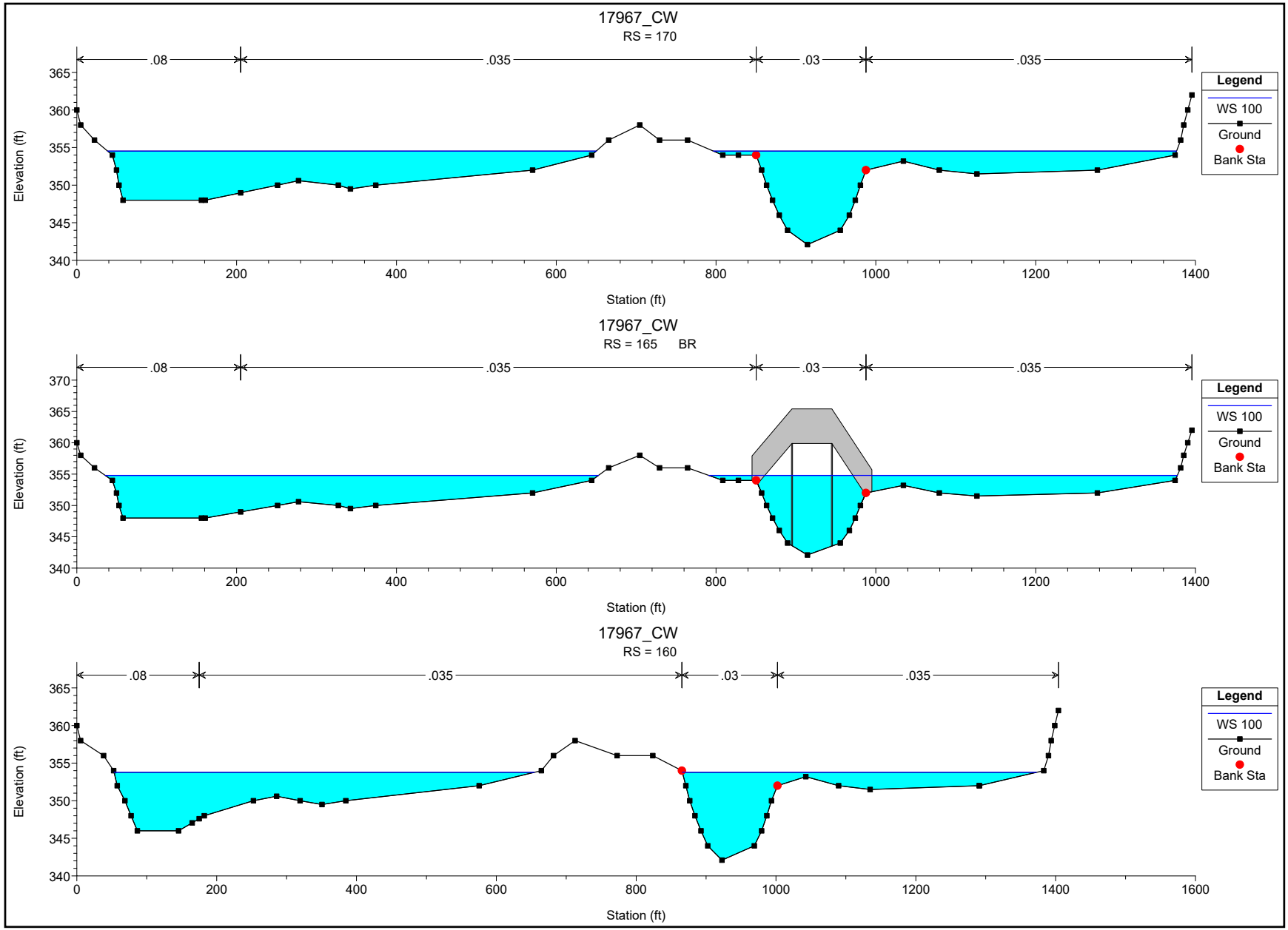

17967_CW
RS = 290
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
355
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 280
.035
.04
.05
Elevation (ft)
380
375
370
365
360
355
350
-200
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
17967_CW
RS = 270
.035
.03
.05
Elevation (ft)
380
375
370
365
360
355
350
-600
-400
-200
0
200
400
600
800
1000
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta

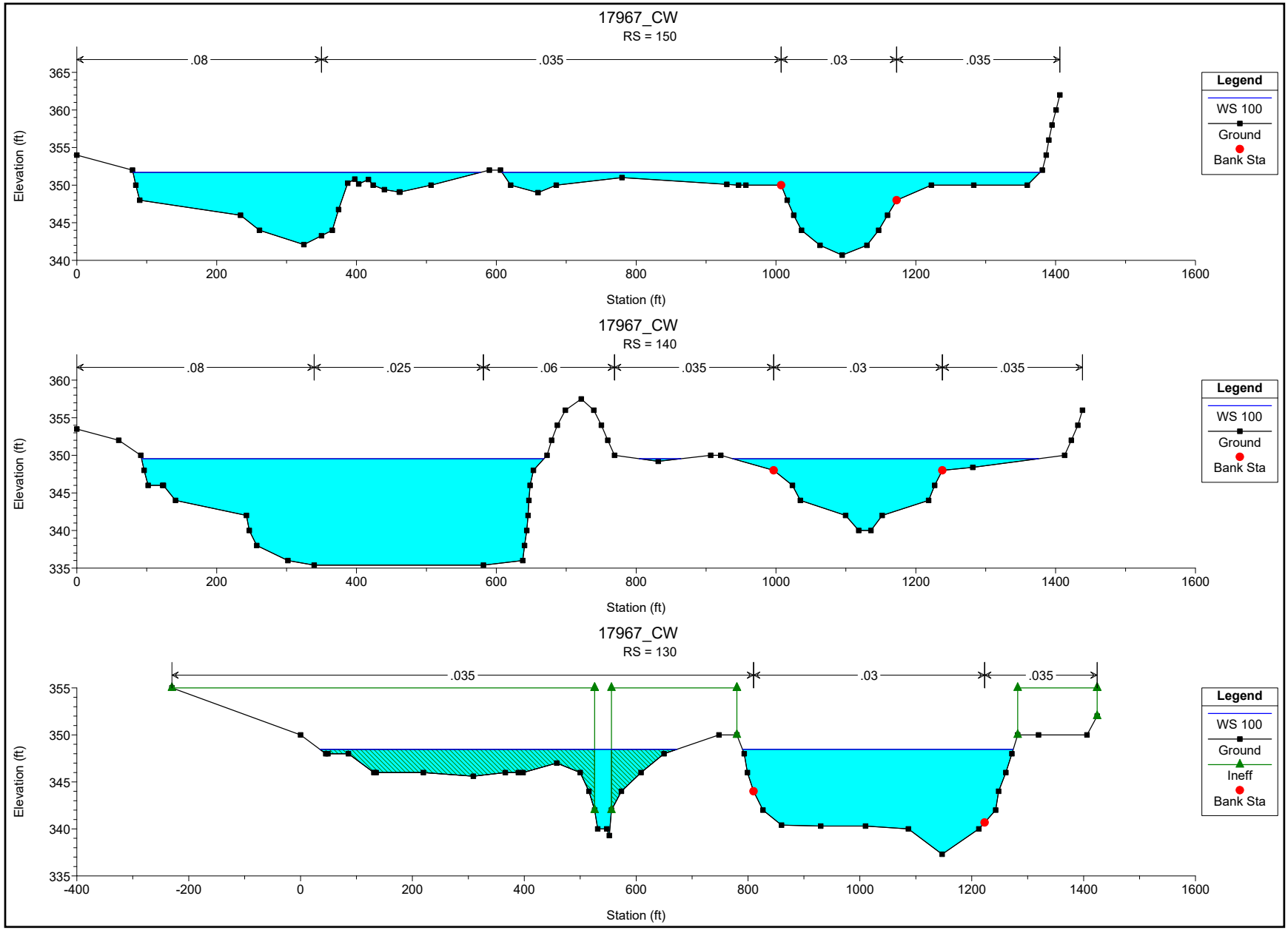

17967_CW
RS = 260
.035
.03
.05
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
17967_CW
RS = 250
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
17967_CW
RS = 245 BR
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta

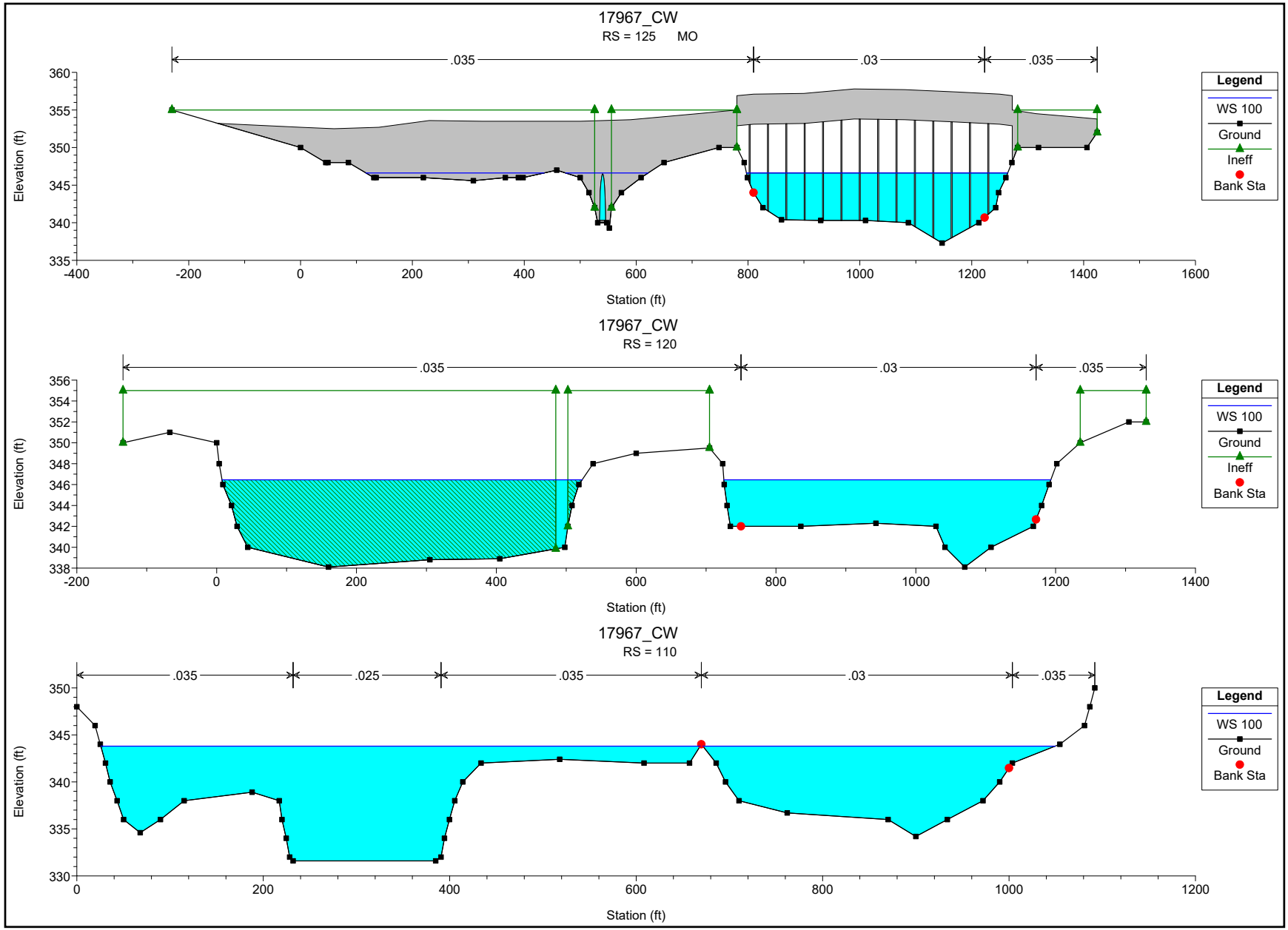

17967_CW
RS = 240
.035
.03
.035
Elevation (ft)
380
375
370
365
360
355
350
345
-600
-400
-200
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
17967_CW
RS = 230
.035
.03
.035
Elevation (ft)
380
375
370
365
360
355
350
345
-200
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
17967_CW
RS = 225 BR
.035
.03
.035
Elevation (ft)
380
375
370
365
360
355
350
345
-200
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta

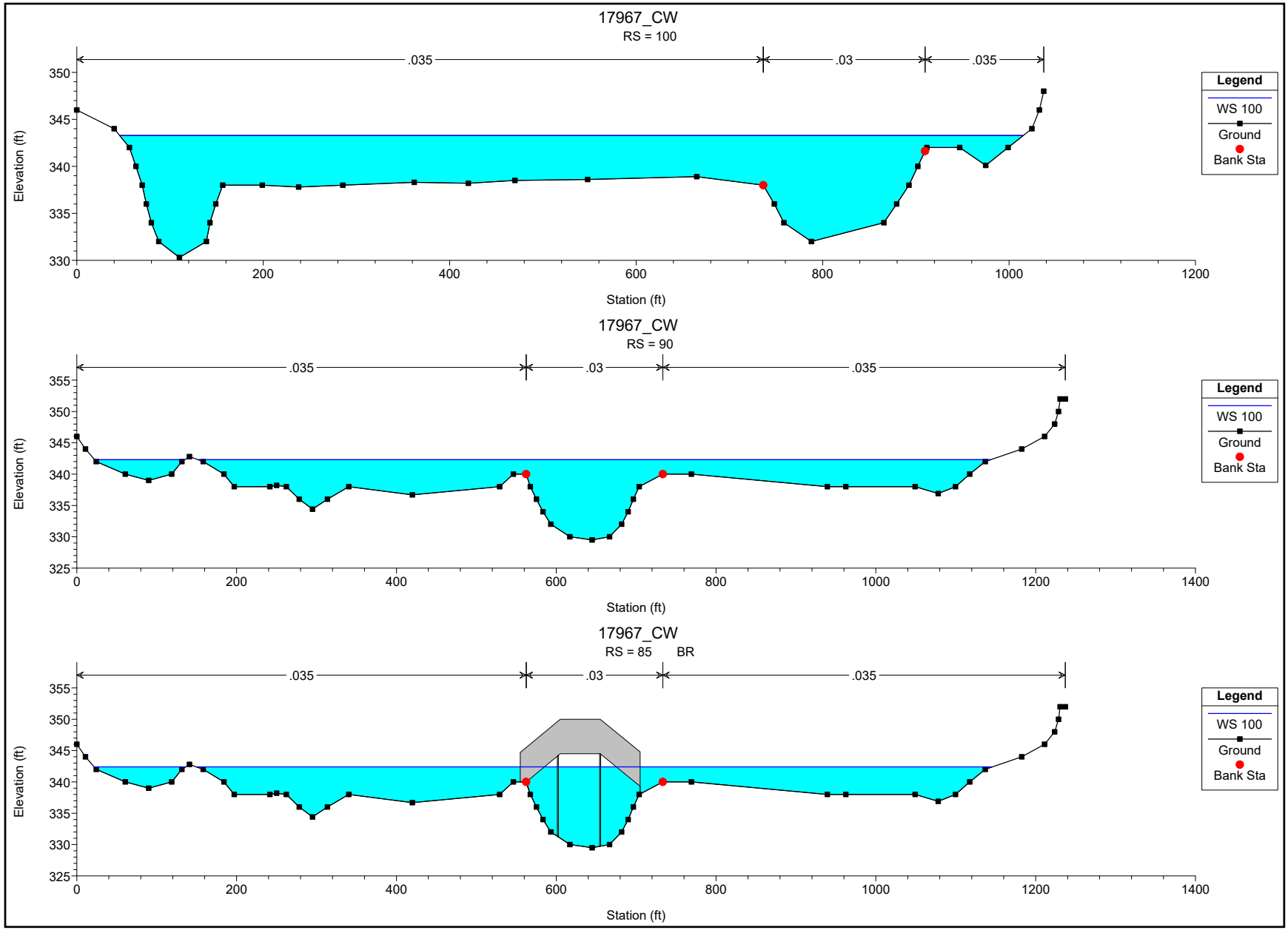

17967_CW
RS = 220
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
17967_CW
RS = 210
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 205 BR
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta

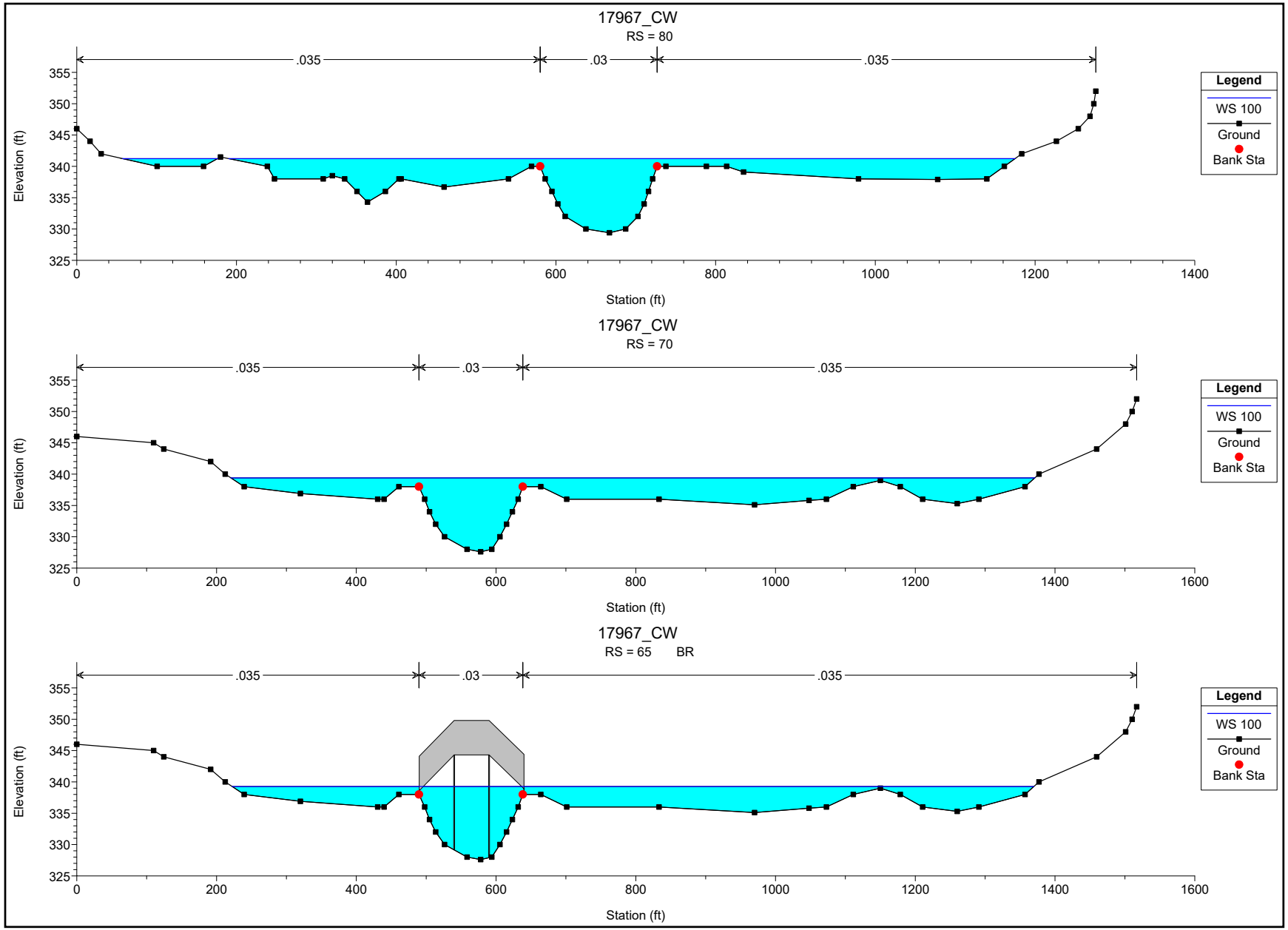

17967_CW
RS = 200
.035
.03
.035
Elevation (ft)
370
365
360
355
350
345
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 190
.035
.06
.035
.03
.035
Elevation (ft)
370
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 180
.035
.03
.035
Elevation (ft)
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS 100
Ground
Bank Sta

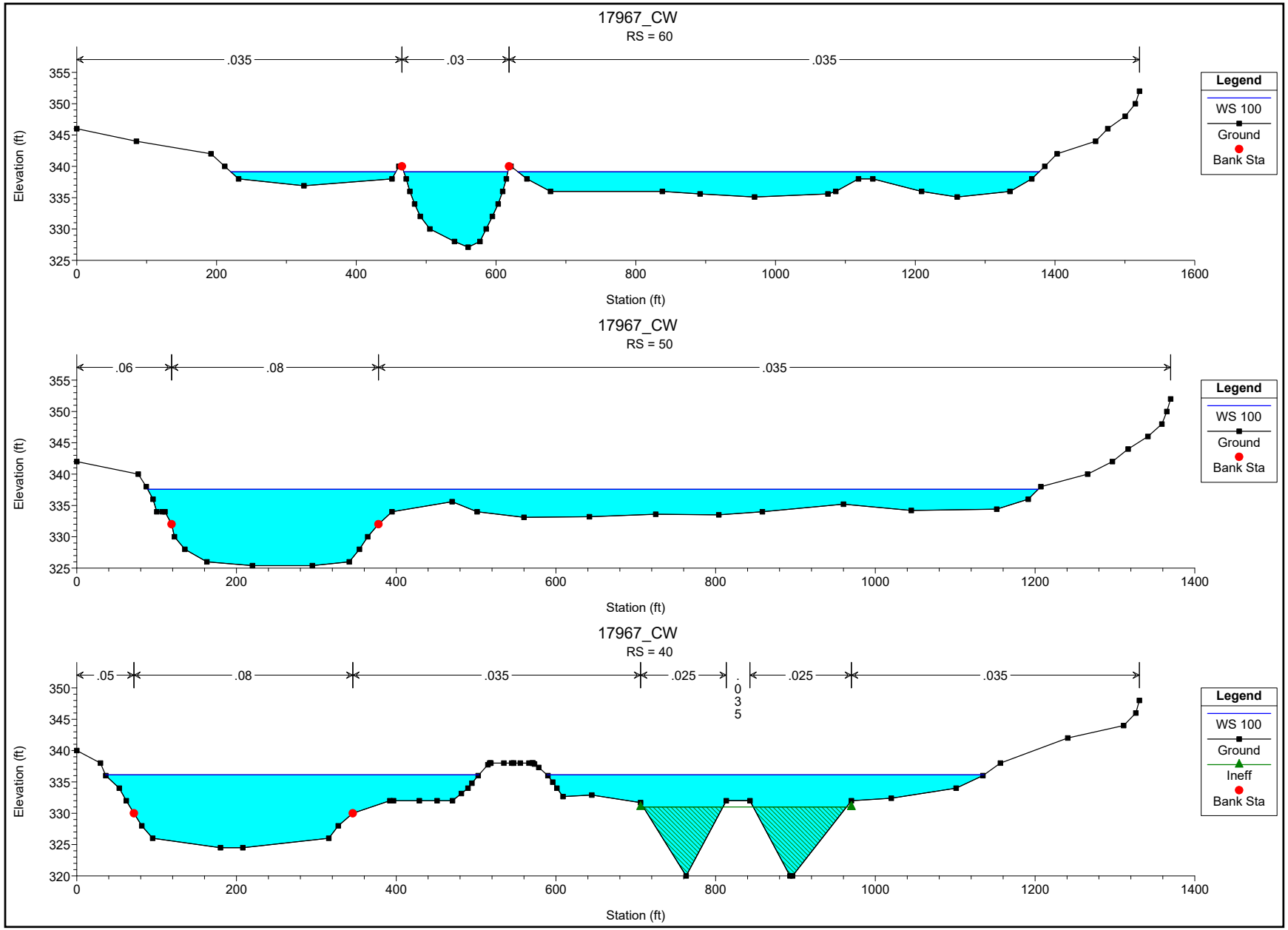

17967_CW
RS = 170
.08
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 165 BR
.08
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 160
.08
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta

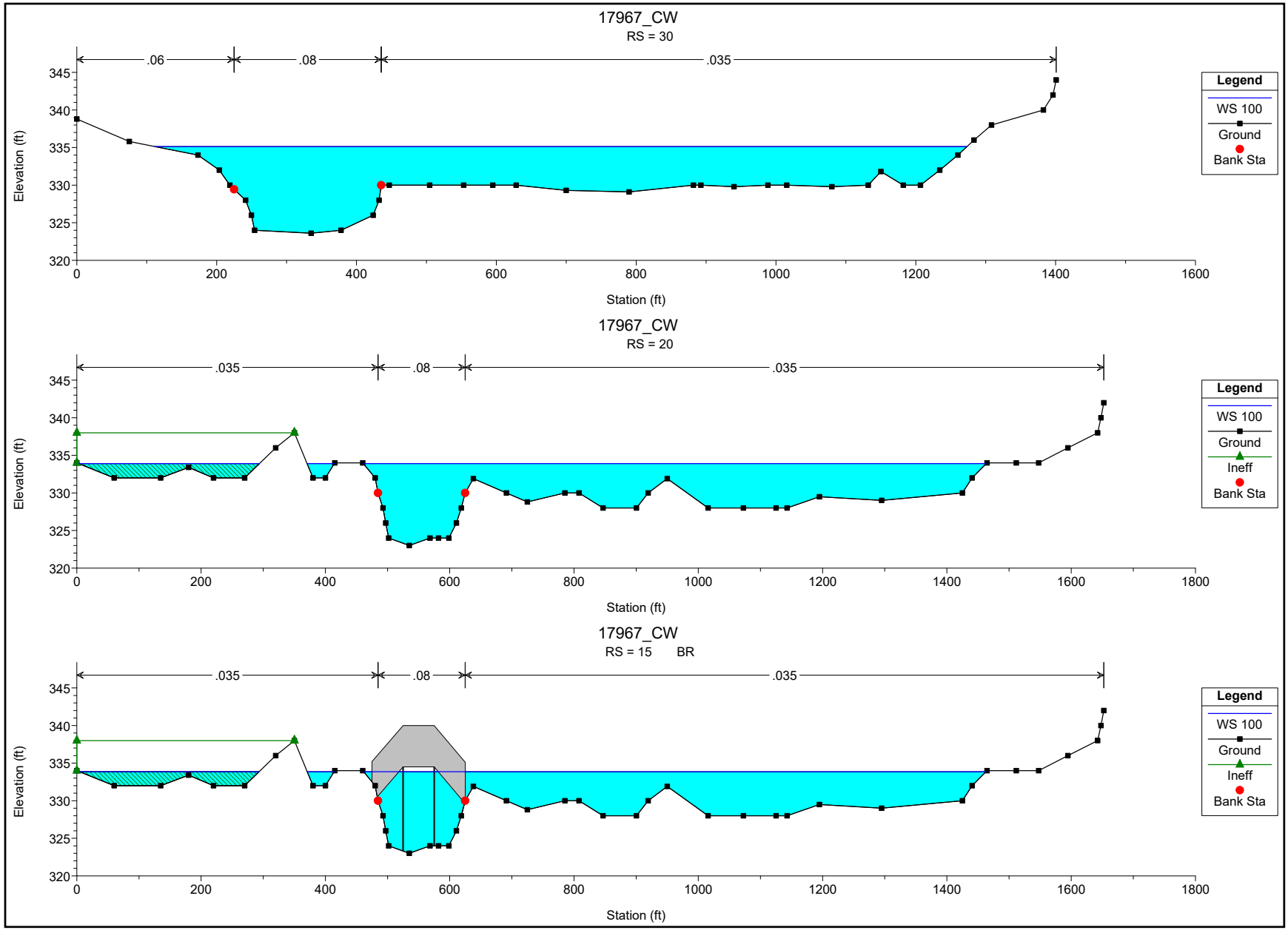

17967_CW
RS = 150
.08
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 140
.08
.025
.06
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 130
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta

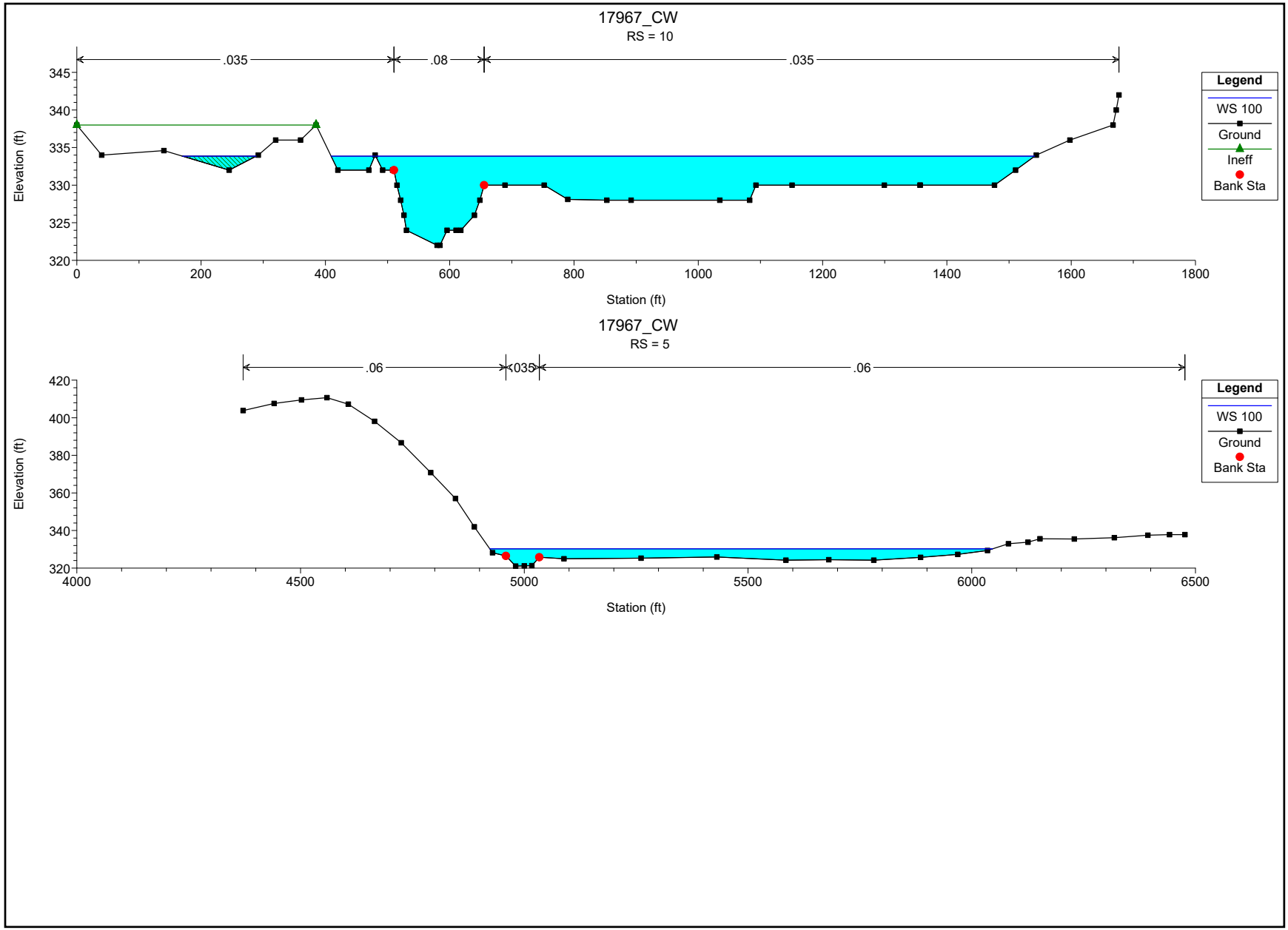

17967_CW
RS = 125 MO
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
17967_CW
RS = 120
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
17967_CW
RS = 110
.035
.025
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta


17967_CW
RS = 100
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 90
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 85 BR
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta


17967_CW
RS = 80
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 70
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 65 BR
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta


17967_CW
RS = 60
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 50
.06
.08
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 40
.05
.08
.035
.025
.035
.025
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta


17967_CW
RS = 30
.06
.08
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Bank Sta
17967_CW
RS = 20
.035
.08
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
17967_CW
RS = 15 BR
.035
.08
.035
Elevation (ft)
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta


17967_CW
RS = 10
.035
.08
.035
Elevation (ft)
345
340
335
330
325
320
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)
Legend
WS 100
Ground
Ineff
Bank Sta
17967_CW
RS = 5
.06
.035
.06
Elevation (ft)
420
400
380
360
340
320
4000
4500
5000
5500
6000
6500
Station (ft)
Legend
WS 100
Ground
Bank Sta

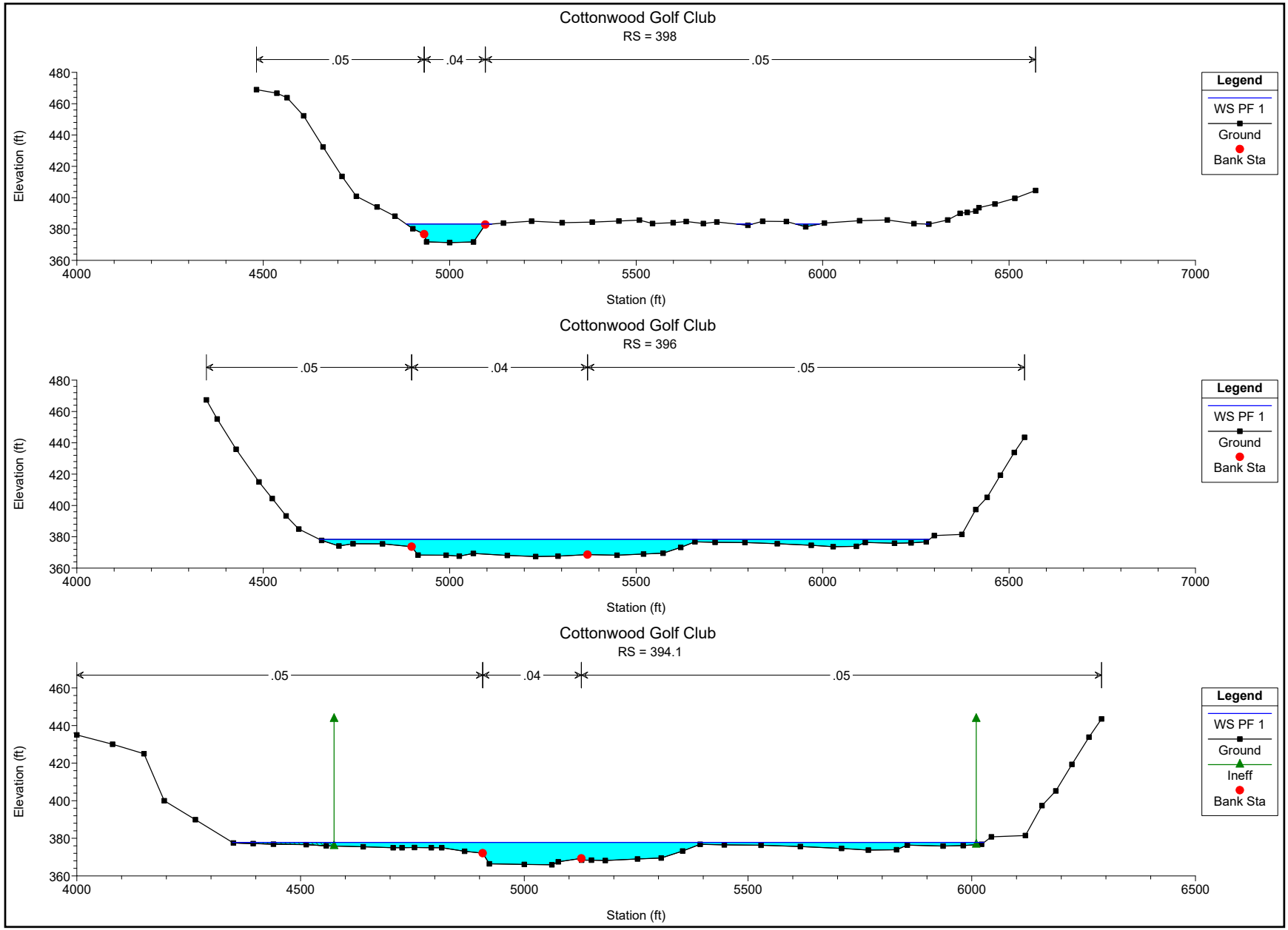
Mining Phase 1

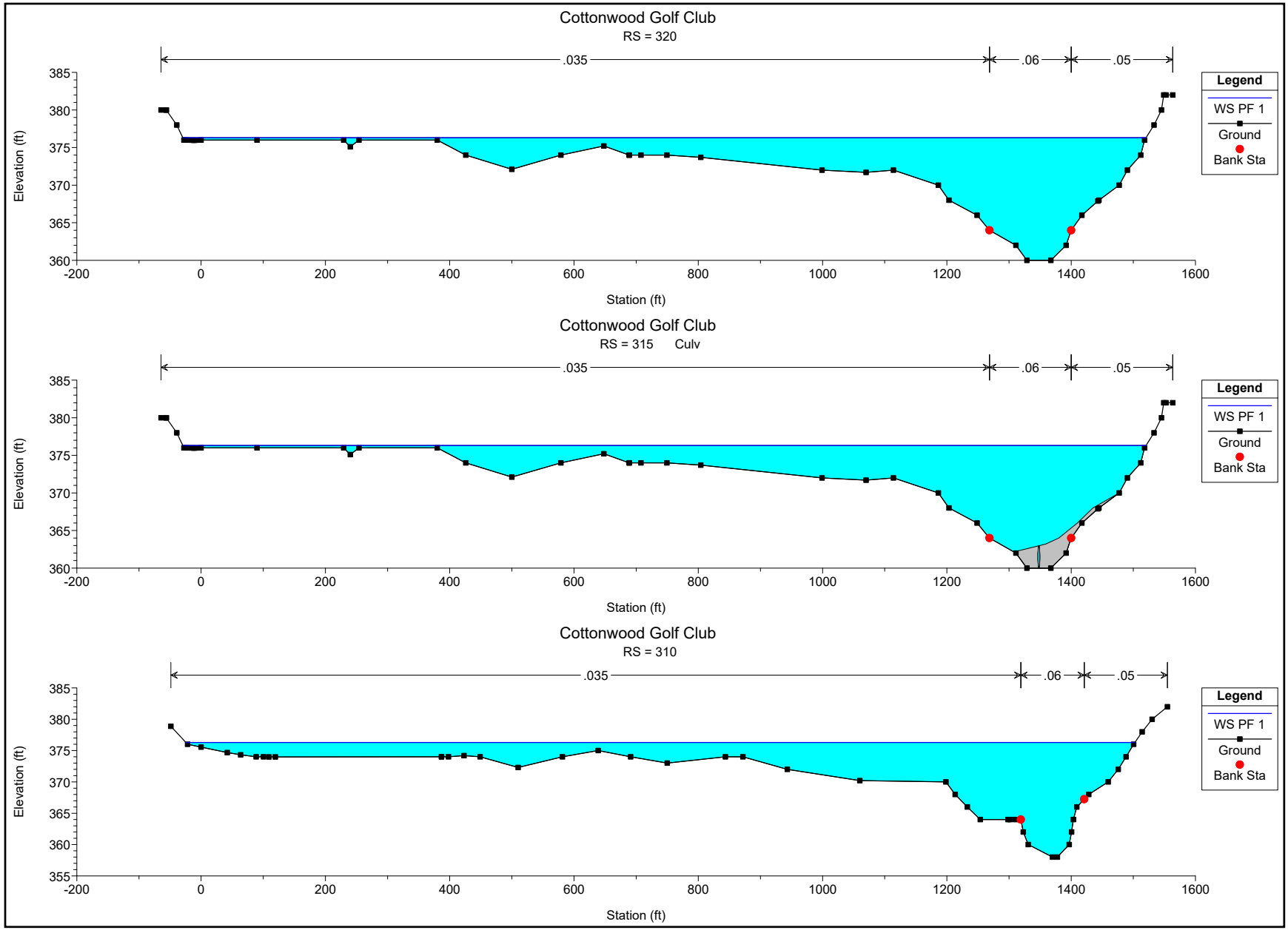
HEC-RAS Plan: PC Phase 1 River: RIVER-1 Reach: Reach-1 Profile: PF 1

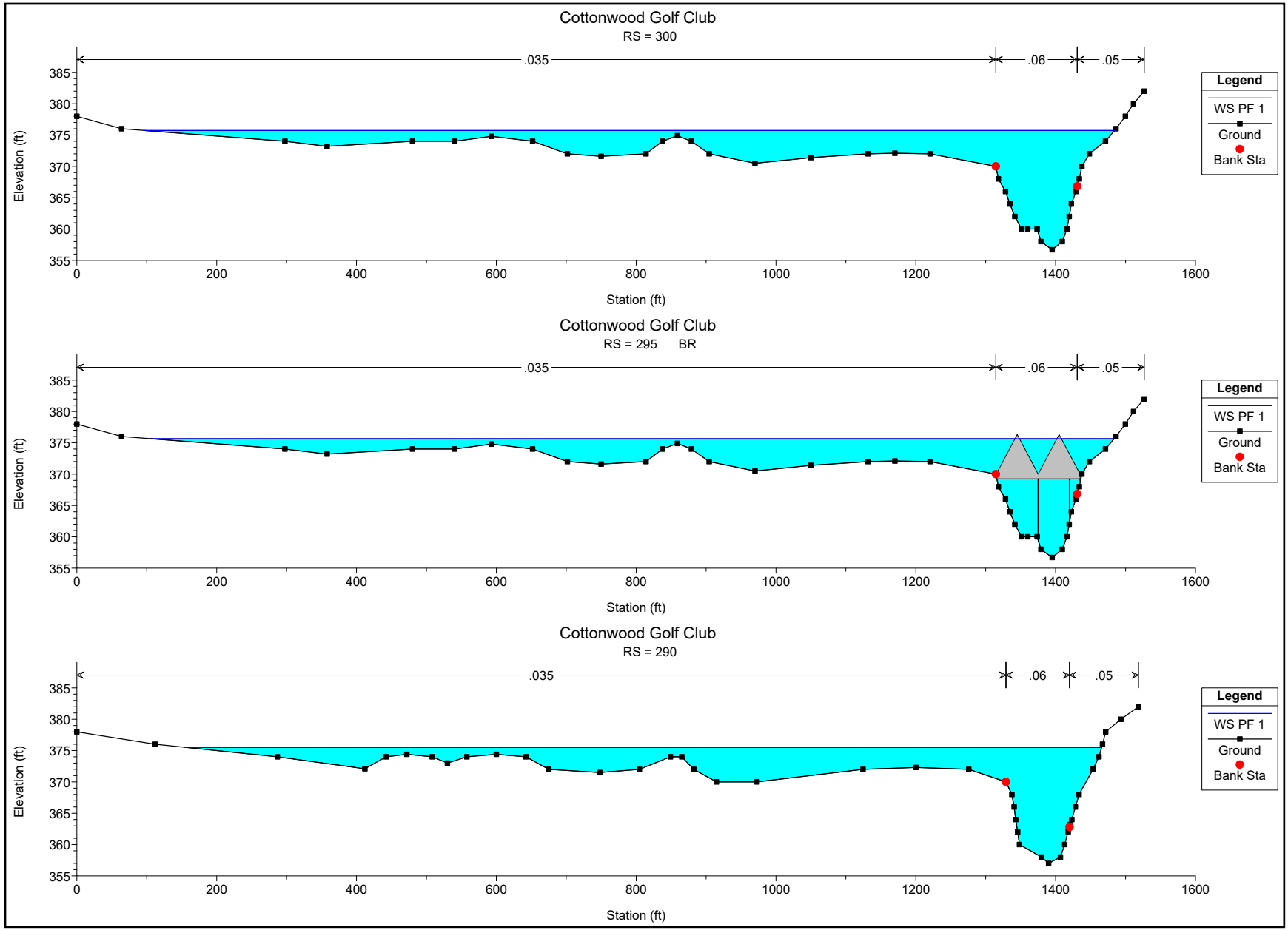
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	398	PF 1	29500.00	371.30	383.17	383.17	387.25	0.008936	16.52	1955.33	346.72	0.90
Reach-1	396	PF 1	29500.00	367.40	378.38		378.59	0.000584	4.20	9721.67	1635.85	0.23
Reach-1	394.1	PF 1	29500.00	365.90	377.81		378.32	0.001542	7.14	6838.40	1679.65	0.38
Reach-1	320	PF 1	29500.00	360.00	376.30	371.89	376.73	0.001952	6.59	6279.88	1549.75	0.30
Reach-1	315		Culvert									
Reach-1	310	PF 1	29500.00	358.00	376.28		376.58	0.001332	5.57	7123.00	1526.89	0.25
Reach-1	300	PF 1	29500.00	356.70	375.73	374.22	376.36	0.003003	7.94	5237.41	1389.15	0.37
Reach-1	295		Bridge									
Reach-1	290	PF 1	29500.00	357.00	375.52		376.15	0.003116	8.26	5088.77	1311.24	0.37
Reach-1	280	PF 1	29500.00	354.60	372.00	372.00	374.39	0.006896	15.00	2918.15	813.73	0.79
Reach-1	270	PF 1	29500.00	351.30	370.66	370.66	372.55	0.002422	13.13	3851.40	1241.65	0.64
Reach-1	260	PF 1	29500.00	349.90	367.90	367.90	369.70	0.002600	12.88	3797.93	1077.01	0.66
Reach-1	250	PF 1	29500.00	347.70	365.55	364.94	366.98	0.001893	10.89	4095.02	981.89	0.56
Reach-1	245		Bridge									
Reach-1	240	PF 1	29500.00	347.70	365.31	364.86	366.87	0.002054	11.27	3932.89	950.11	0.58
Reach-1	230	PF 1	29500.00	346.00	364.67	363.81	366.22	0.001776	11.32	3984.29	1061.74	0.55
Reach-1	225		Bridge									
Reach-1	220	PF 1	29500.00	346.00	363.65	363.65	365.86	0.002594	13.12	3294.18	896.67	0.66
Reach-1	210	PF 1	29500.00	345.30	362.54	361.40	363.56	0.001345	9.77	5066.40	1143.45	0.48
Reach-1	205		Bridge									
Reach-1	200	PF 1	29500.00	345.30	361.42	361.42	363.30	0.002438	12.49	3775.20	1032.94	0.64
Reach-1	190	PF 1	29500.00	343.70	359.56	359.56	361.51	0.002915	12.91	3651.46	1022.27	0.69
Reach-1	180	PF 1	29500.00	342.80	356.18	356.18	357.72	0.003876	12.86	3862.30	1116.68	0.77
Reach-1	170	PF 1	29500.00	342.10	354.53	354.06	355.68	0.003014	11.51	4697.07	1191.20	0.68
Reach-1	165		Bridge									
Reach-1	160	PF 1	29500.00	342.10	353.77	353.77	355.38	0.004551	13.38	3963.11	1107.15	0.83
Reach-1	150	PF 1	29500.00	340.70	351.69	351.69	353.25	0.004000	12.70	4463.50	1266.04	0.78
Reach-1	140	PF 1	29500.00	340.00	349.51		349.73	0.000249	2.64	8024.10	1059.92	0.19
Reach-1	130	PF 1	29500.00	337.30	348.46	345.10	349.33	0.001372	7.64	4039.56	1122.09	0.46
Reach-1	125		Mult Open									
Reach-1	120	PF 1	29500.00	338.10	346.46	346.46	348.93	0.007768	12.80	2359.51	982.82	1.01
Reach-1	110	PF 1	29500.00	334.00	342.69		342.93	0.001323	3.97	7431.45	1017.85	0.26
Reach-1	100	PF 1	29500.00	332.20	341.94		342.22	0.002151	3.79	7249.99	866.61	0.22
Reach-1	90	PF 1	29500.00	331.00	340.53		340.79	0.002873	4.11	7209.08	1000.04	0.24
Reach-1	80	PF 1	29500.00	331.00	340.45		340.72	0.002908	4.12	7205.16	1036.12	0.24
Reach-1	70	PF 1	29500.00	329.80	339.28		339.50	0.002975	3.76	7799.26	1156.97	0.22
Reach-1	60	PF 1	29500.00	329.80	339.21		339.43	0.003037	3.63	7955.90	1166.75	0.21
Reach-1	50	PF 1	29500.00	326.00	337.28		337.62	0.004460	5.39	6378.49	1064.31	0.31

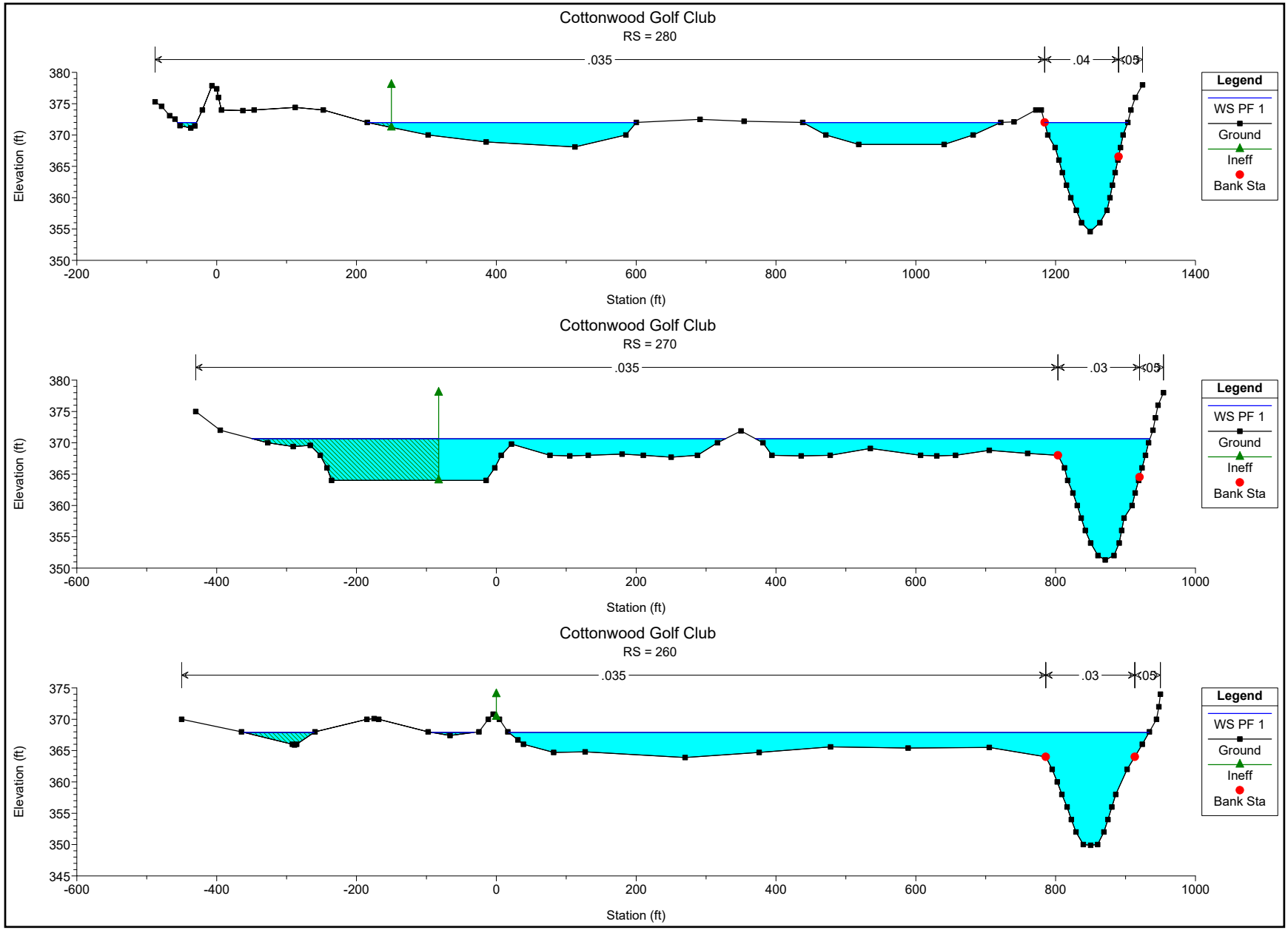
HEC-RAS Plan: PC Phase 1 River: RIVER-1 Reach: Reach-1 Profile: PF 1 (Continued)

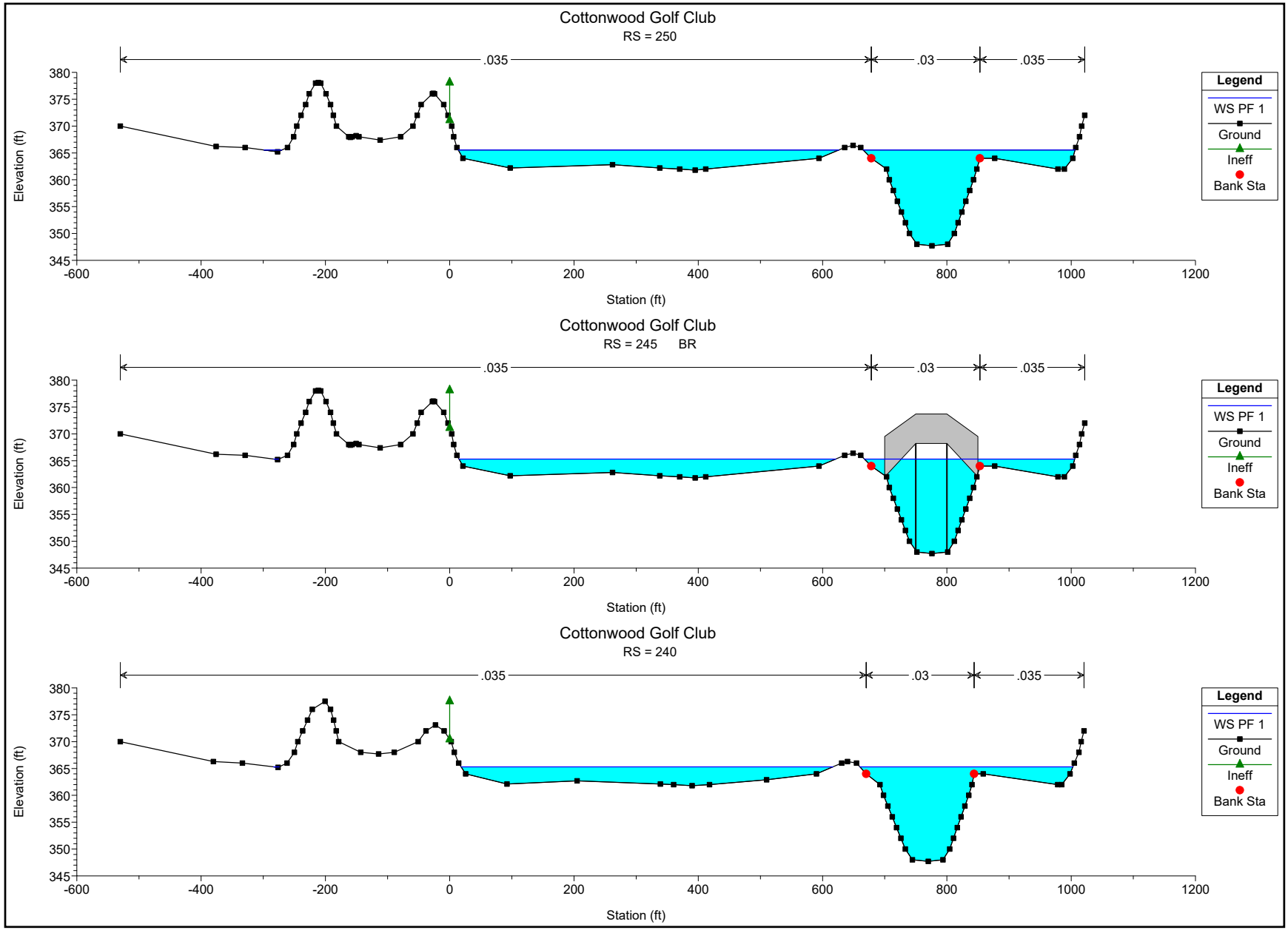
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	40	PF 1	29500.00	324.00	335.63		335.91	0.002460	4.55	7081.80	1096.53	0.27
Reach-1	30	PF 1	29500.00	324.00	334.80		335.01	0.001108	2.70	8251.28	1142.26	0.16
Reach-1	20	PF 1	29500.00	324.00	333.91		334.32	0.001881	4.77	5746.74	1011.29	0.34
Reach-1	10	PF 1	29500.00	324.00	333.75		334.26	0.002611	5.83	5166.49	1069.62	0.40
Reach-1	5	PF 1	29500.00	321.10	330.28	328.76	330.93	0.004294	10.82	5598.21	1123.72	0.68

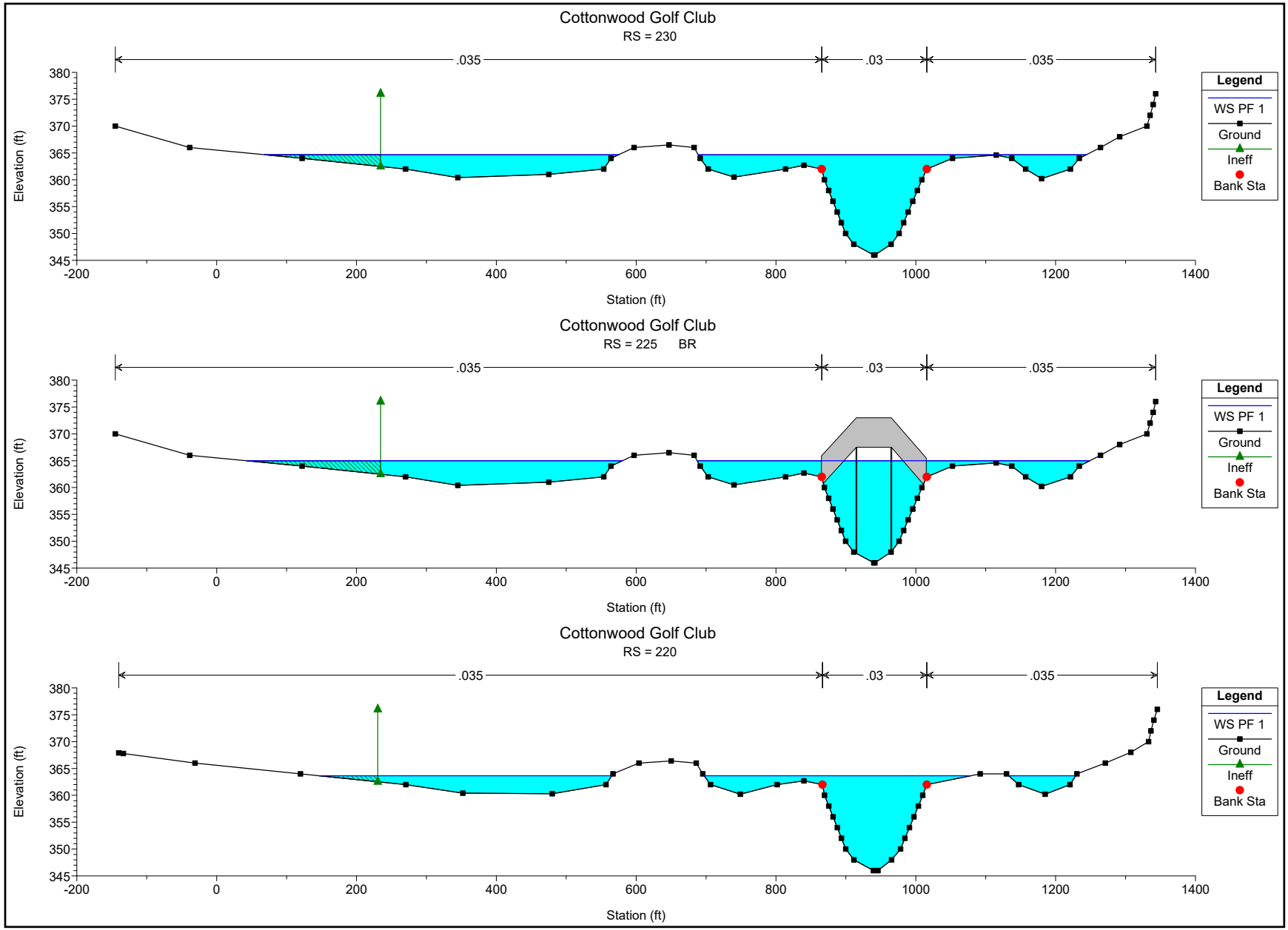

Cottonwood Golf Club
RS = 398
.05
.04
.05
Elevation (ft)
480
460
440
420
400
380
360
4000
4500
5000
5500
6000
6500
7000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 396
.05
.04
.05
Elevation (ft)
480
460
440
420
400
380
360
4000
4500
5000
5500
6000
6500
7000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 394.1
.05
.04
.05
Elevation (ft)
460
440
420
400
380
360
4000
4500
5000
5500
6000
6500
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta

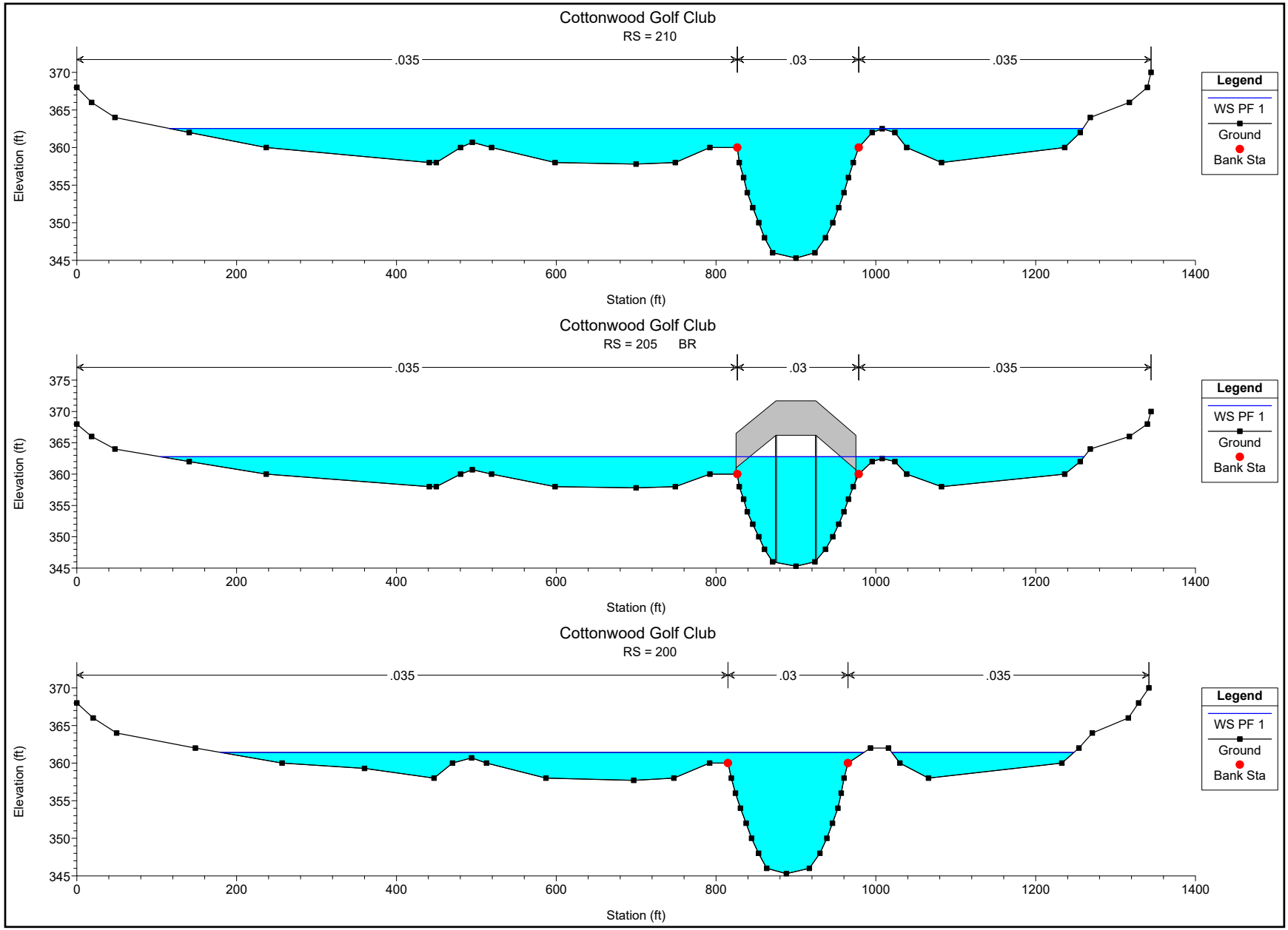

Cottonwood Golf Club
RS = 320
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
-200
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 315 Culv
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
-200
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 310
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
355
-200
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

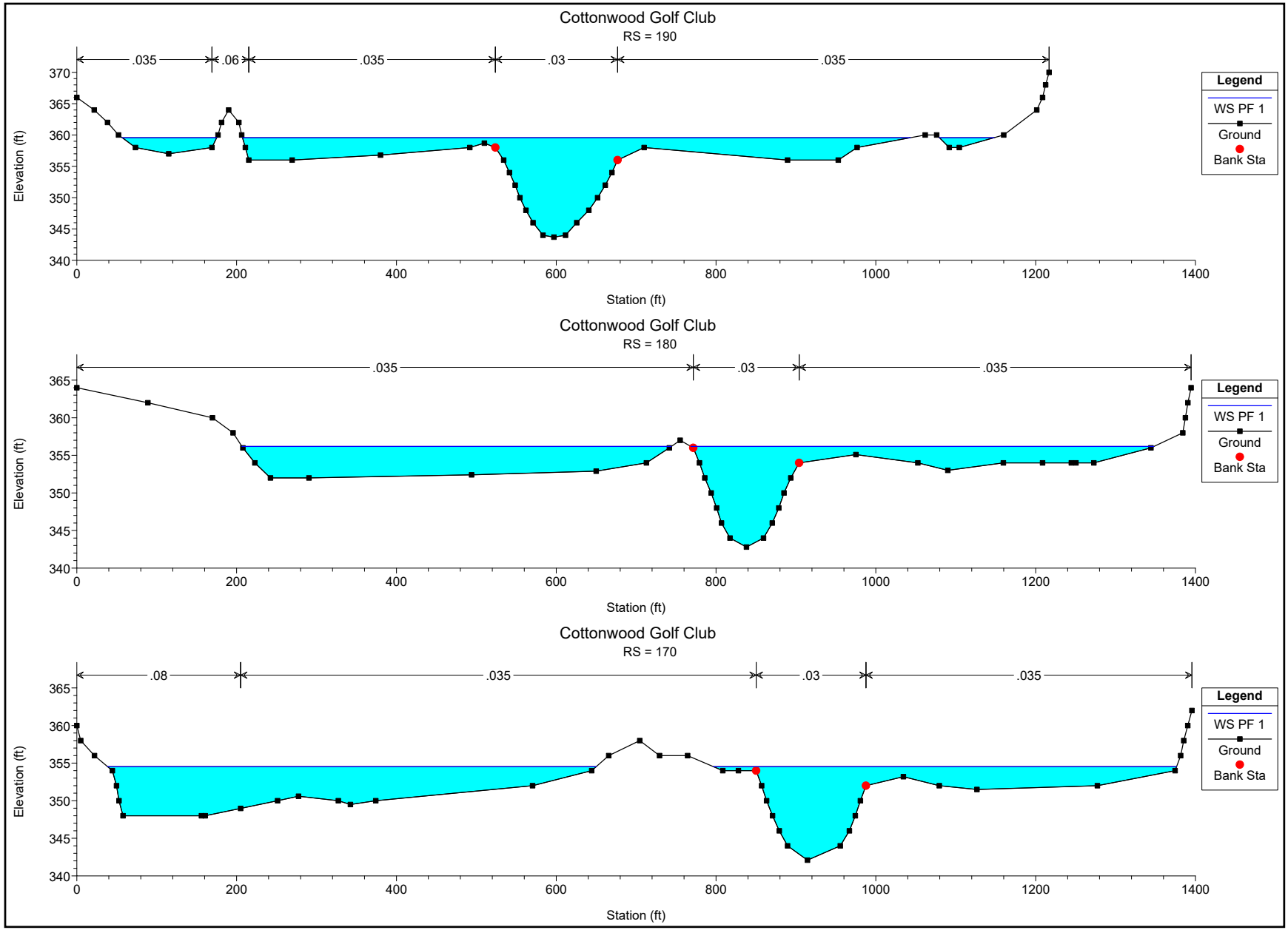

Cottonwood Golf Club
RS = 300
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
355
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 295 BR
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
355
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 290
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
355
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

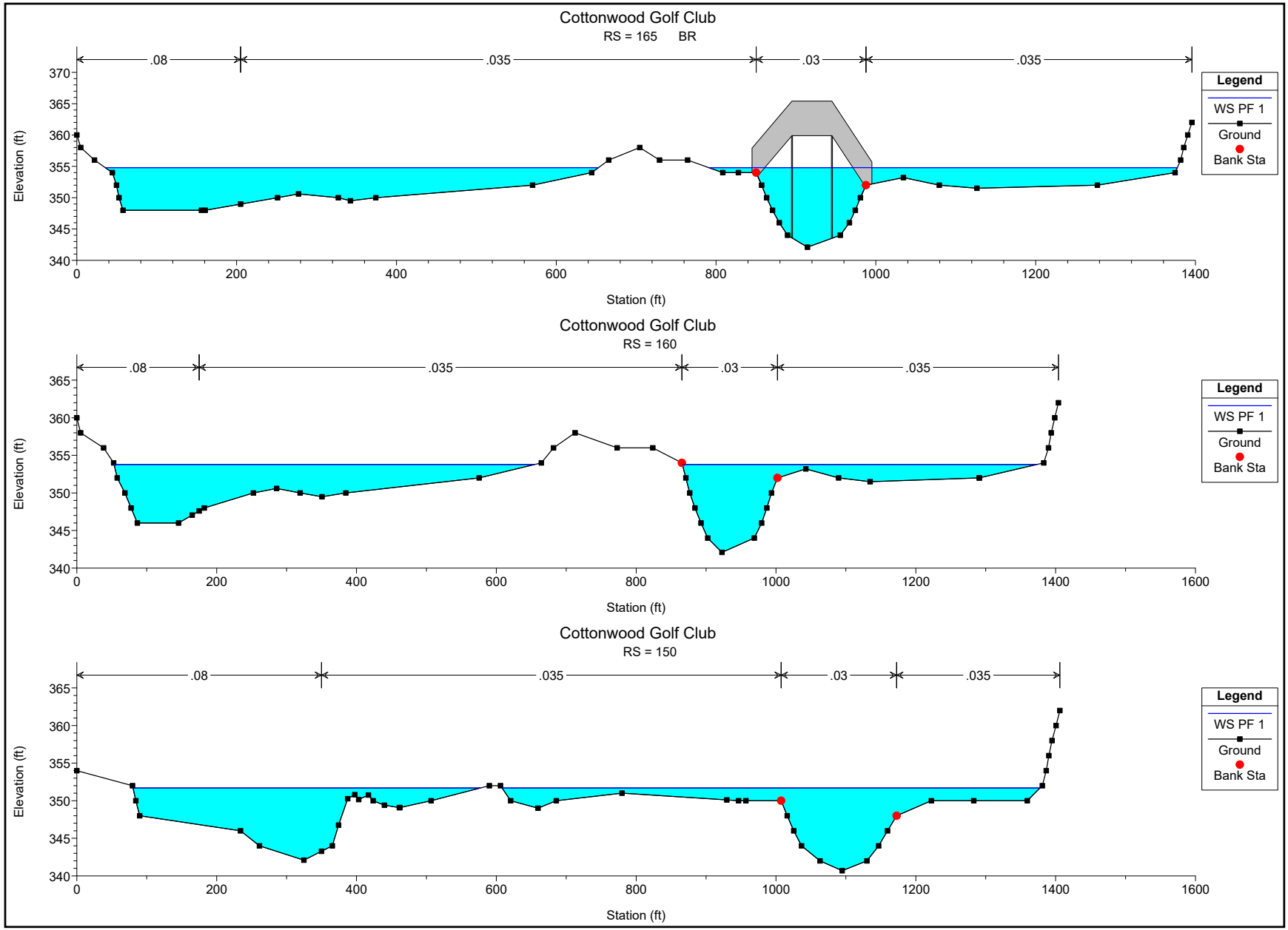

Cottonwood Golf Club
RS = 280
.035
.04
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 270
.035
.03
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 260
.035
.03
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta

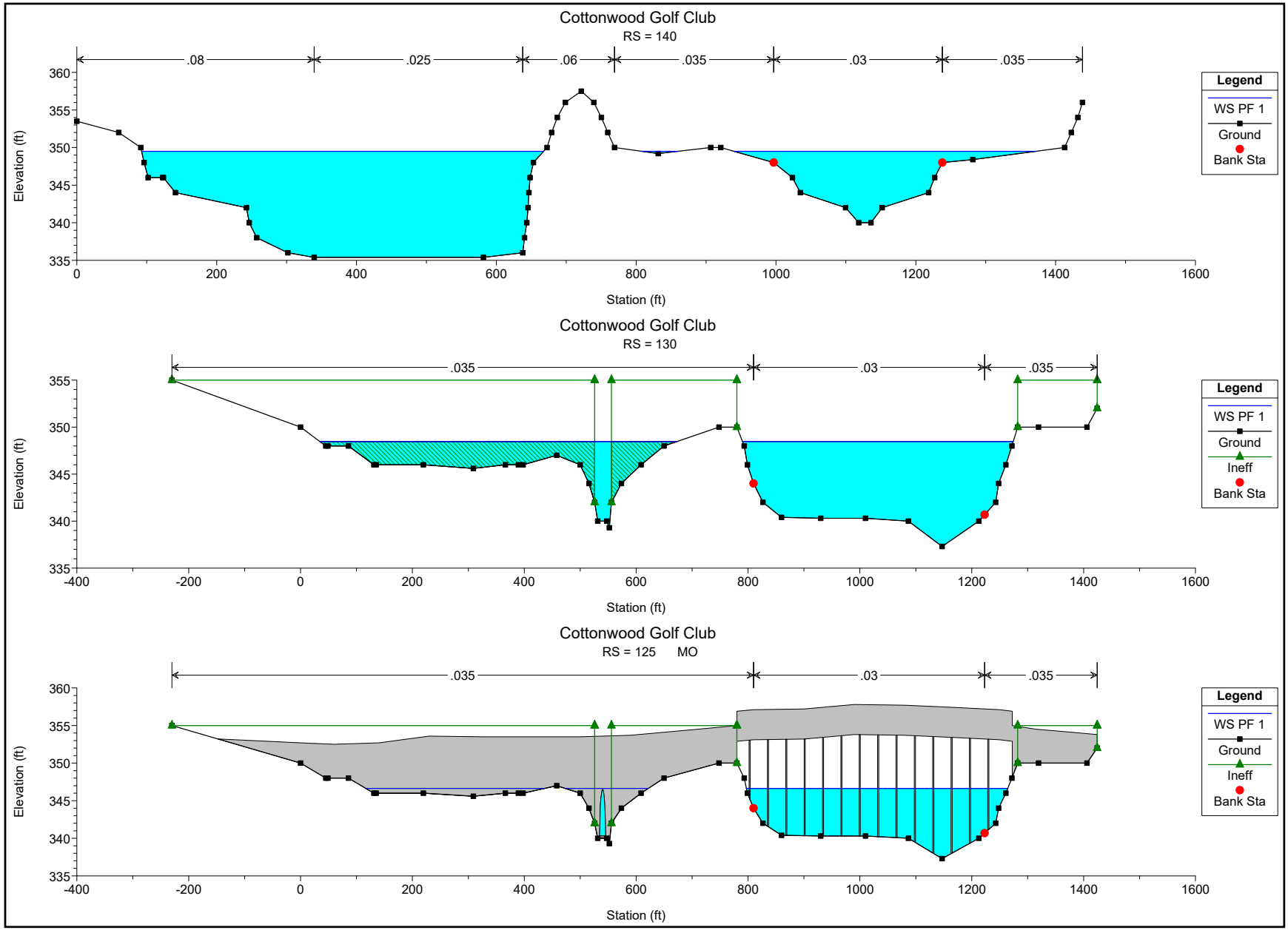

Cottonwood Golf Club
RS = 250
.035
.03
.035
Elevation (ft)
380
375
370
365
360
355
350
345
-600
-400
-200
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 245 BR
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 240
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta

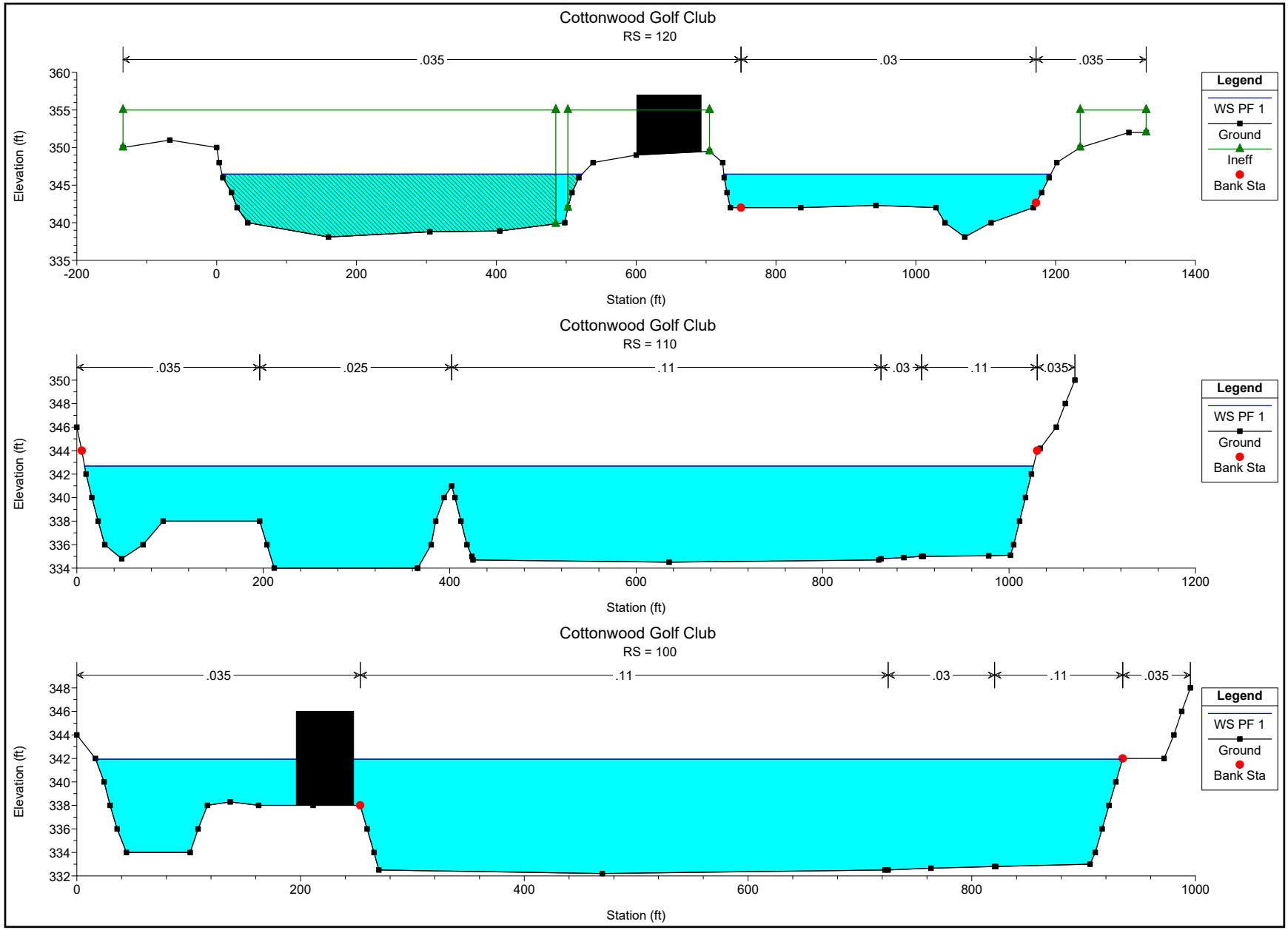

Cottonwood Golf Club
RS = 230
.035
.03
.035
Elevation (ft)
380
375
370
365
360
355
350
345
-200
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 225 BR
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 220
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta

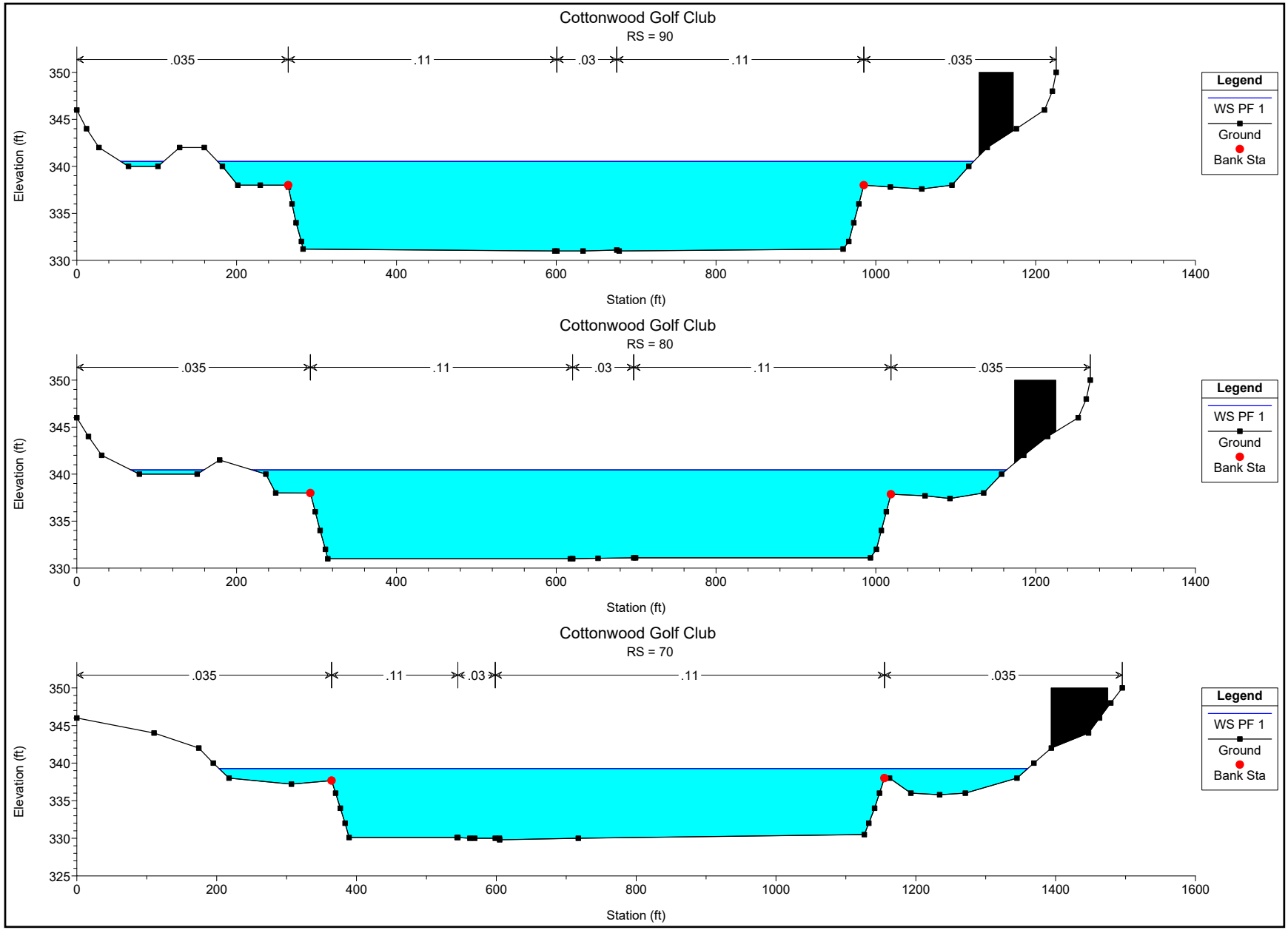

Cottonwood Golf Club
RS = 210
.035
.03
.035
Elevation (ft)
370
365
360
355
350
345
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 205 BR
.035
.03
.035
Elevation (ft)
375
370
365
360
355
350
345
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 200
.035
.03
.035
Elevation (ft)
370
365
360
355
350
345
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

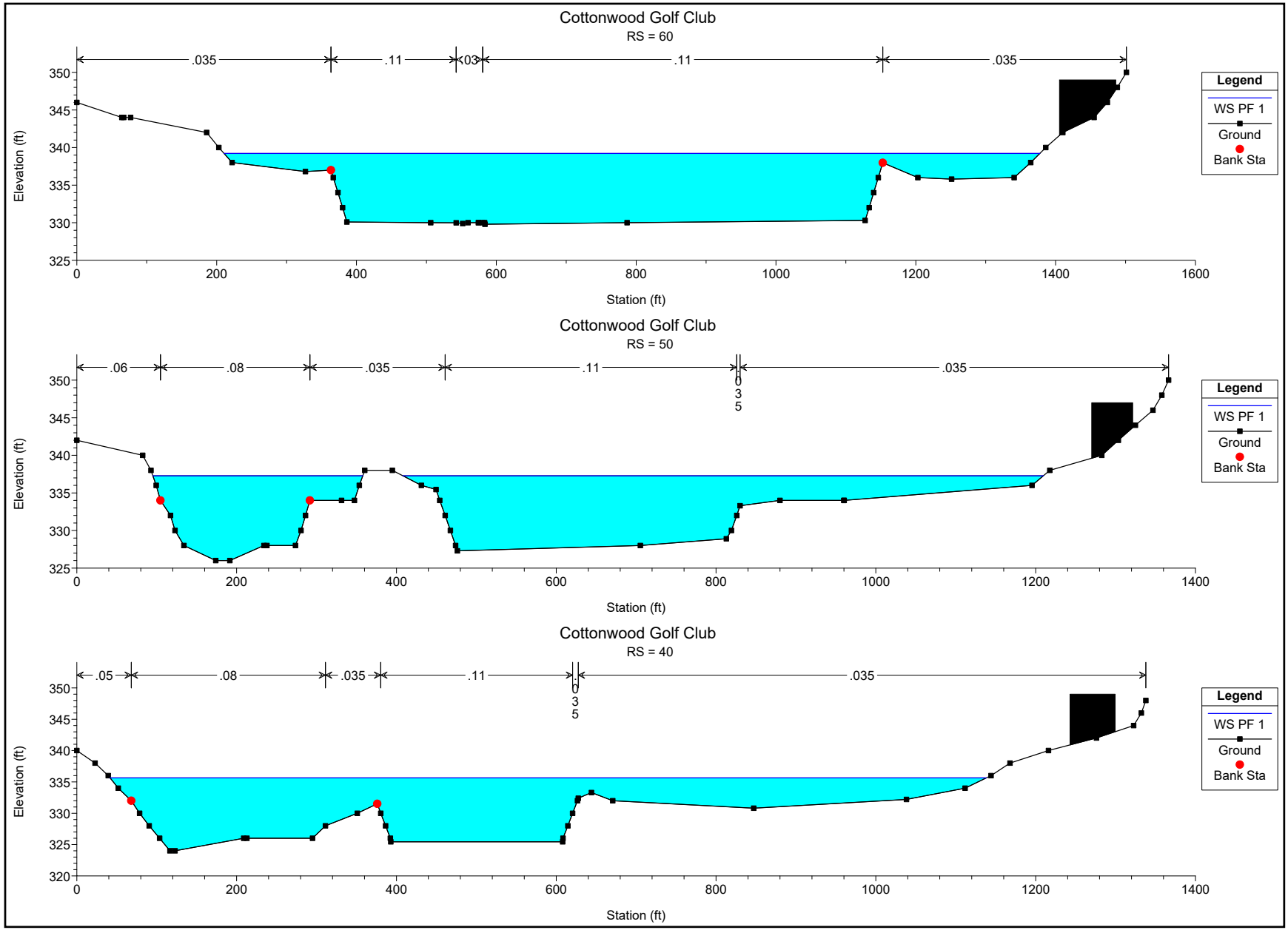

Cottonwood Golf Club
RS = 190
.035
.06
.035
.03
.035
Elevation (ft)
370
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 180
.035
.03
.035
Elevation (ft)
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 170
.08
.035
.03
.035
Elevation (ft)
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

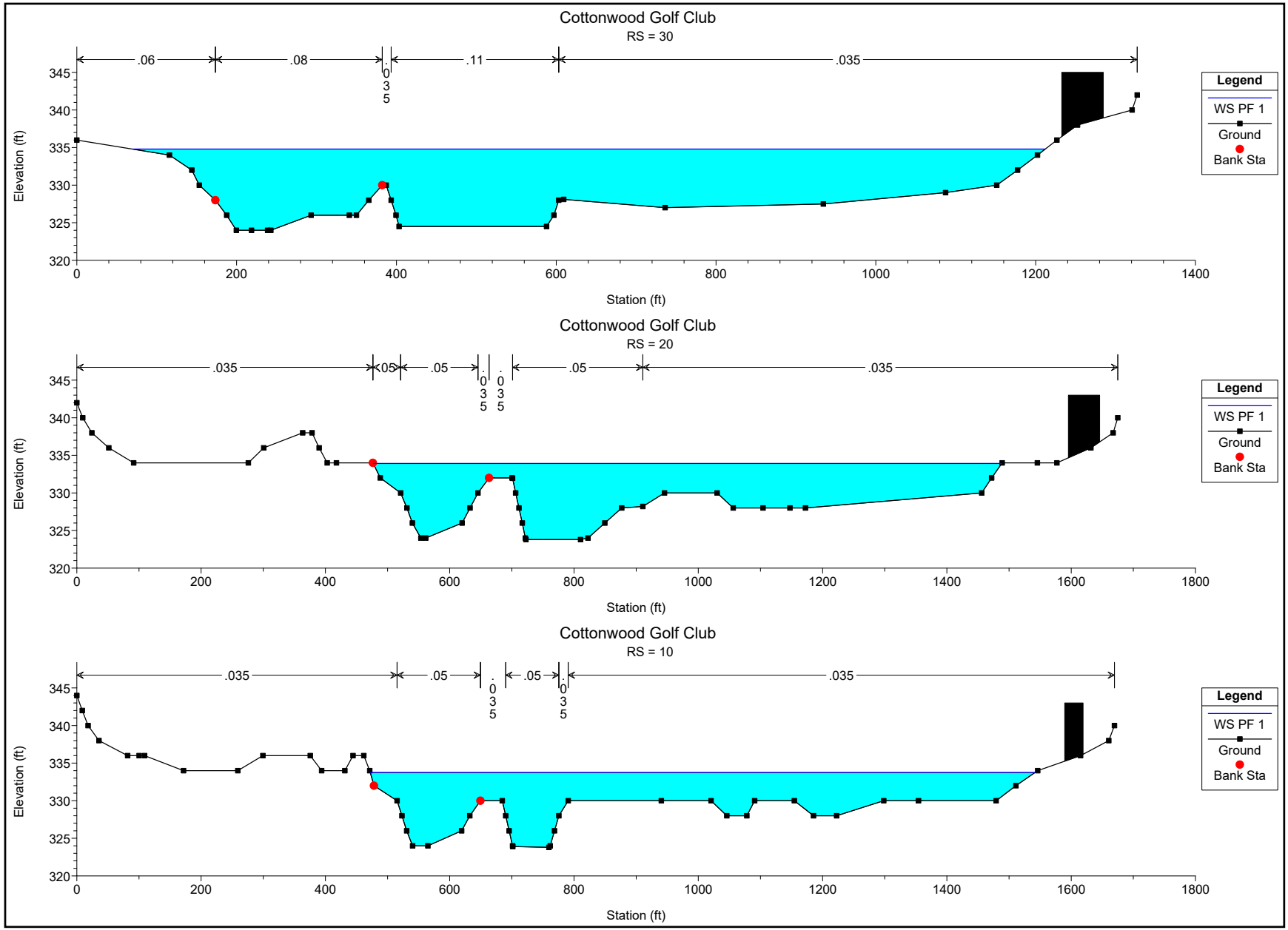

Cottonwood Golf Club
RS = 165 BR
.08
.035
.03
.035
Elevation (ft)
370
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 160
.08
.035
.03
.035
Elevation (ft)
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 150
.08
.035
.03
.035
Elevation (ft)
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

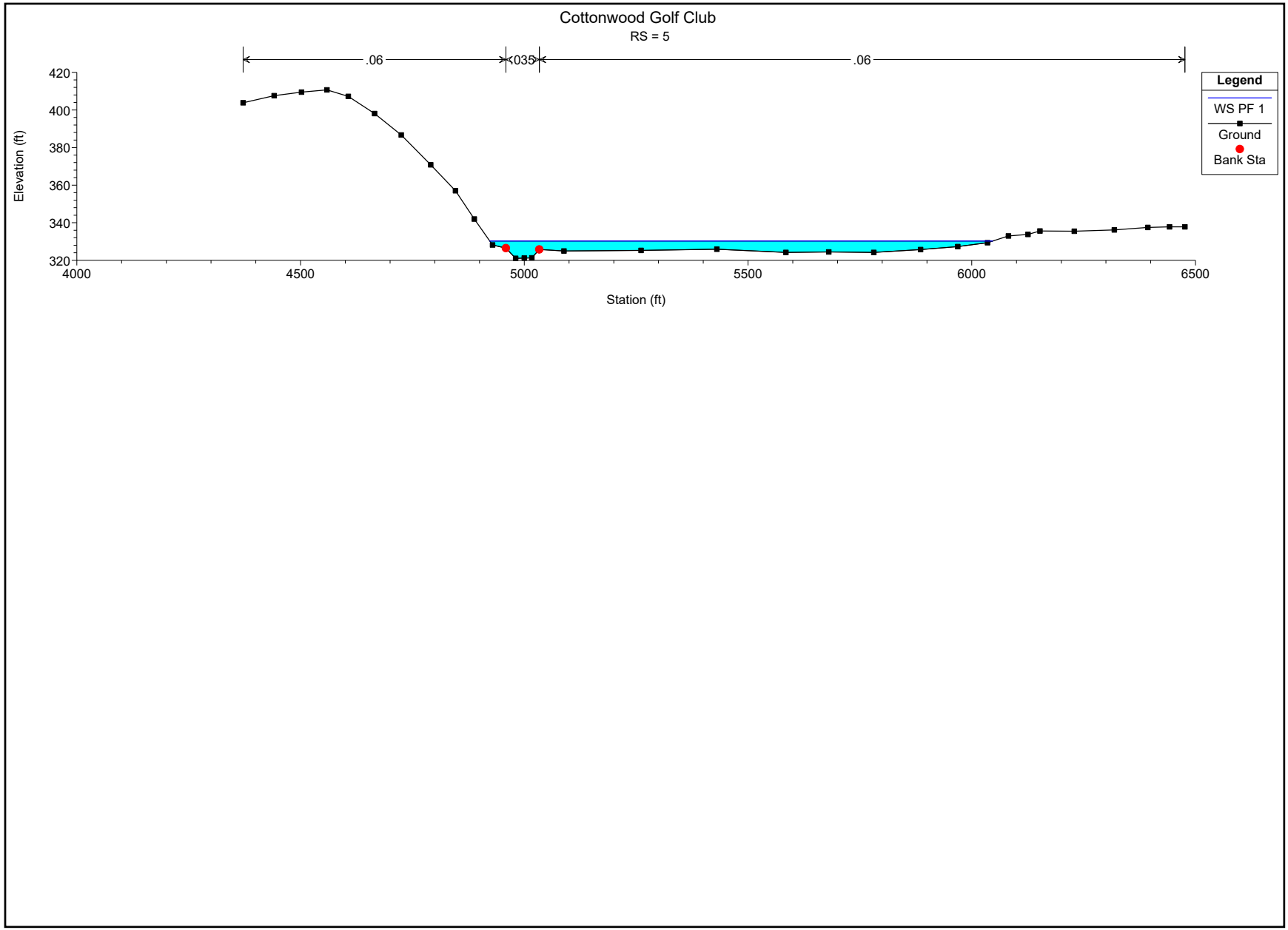

Cottonwood Golf Club
RS = 140
.08
.025
.06
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 130
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 125 MO
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta


Cottonwood Golf Club
RS = 120
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 110
.035
.025
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 100
.035
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 90
.035
.11
.03
.11
.035
Elevation (ft)
350
345
340
335
330
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 80
.035
.11
.03
.11
.035
Elevation (ft)
350
345
340
335
330
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 70
.035
.11
.03
.11
.035
Elevation (ft)
350
345
340
335
330
325
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 60
.035
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 50
.06
.08
.035
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 40
.05
.08
.035
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 30
.06
.08
.035
.11
.035
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Cottonwood Golf Club
RS = 20
.035
.05
.05
.035
.05
.035
.035
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Cottonwood Golf Club
RS = 10
.035
.05
.05
.035
.035
.035
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Cottonwood Golf Club
RS = 5
.06
.035
.06
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
420
400
380
360
340
320
4000
4500
5000
5500
6000
6500

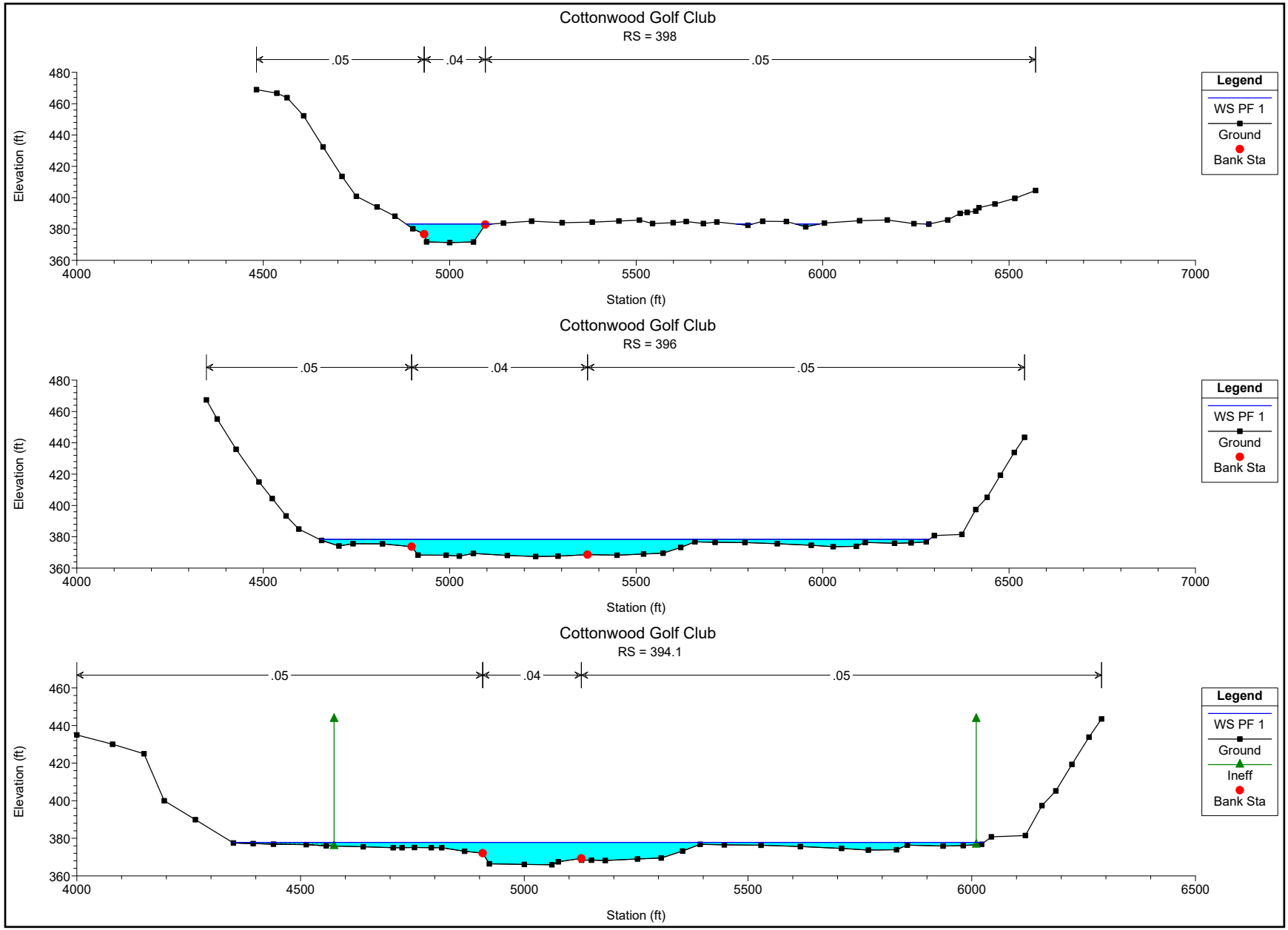
Mining Phase 2

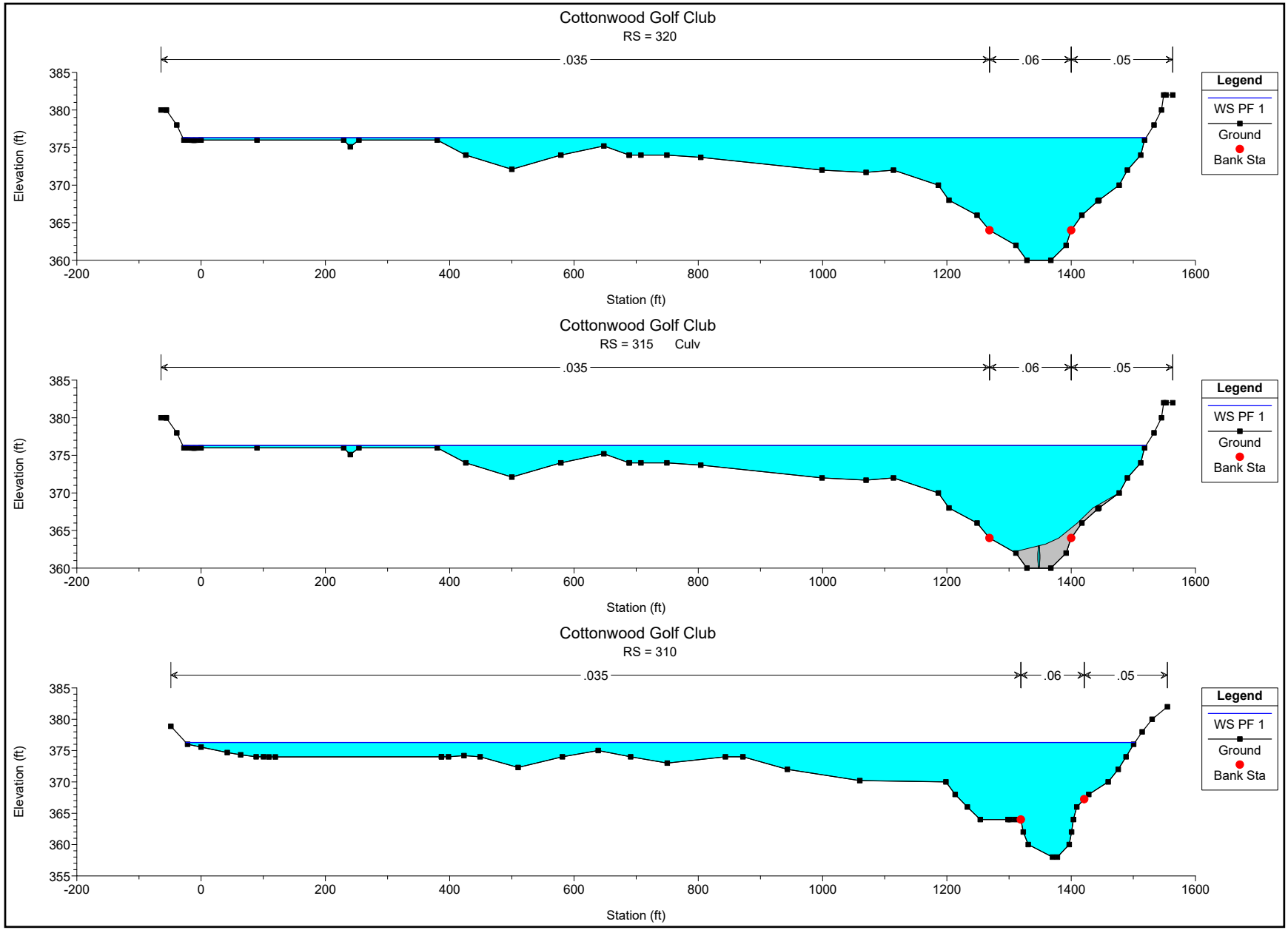
HEC-RAS Plan: PC Phase 2 River: RIVER-1 Reach: Reach-1 Profile: PF 1

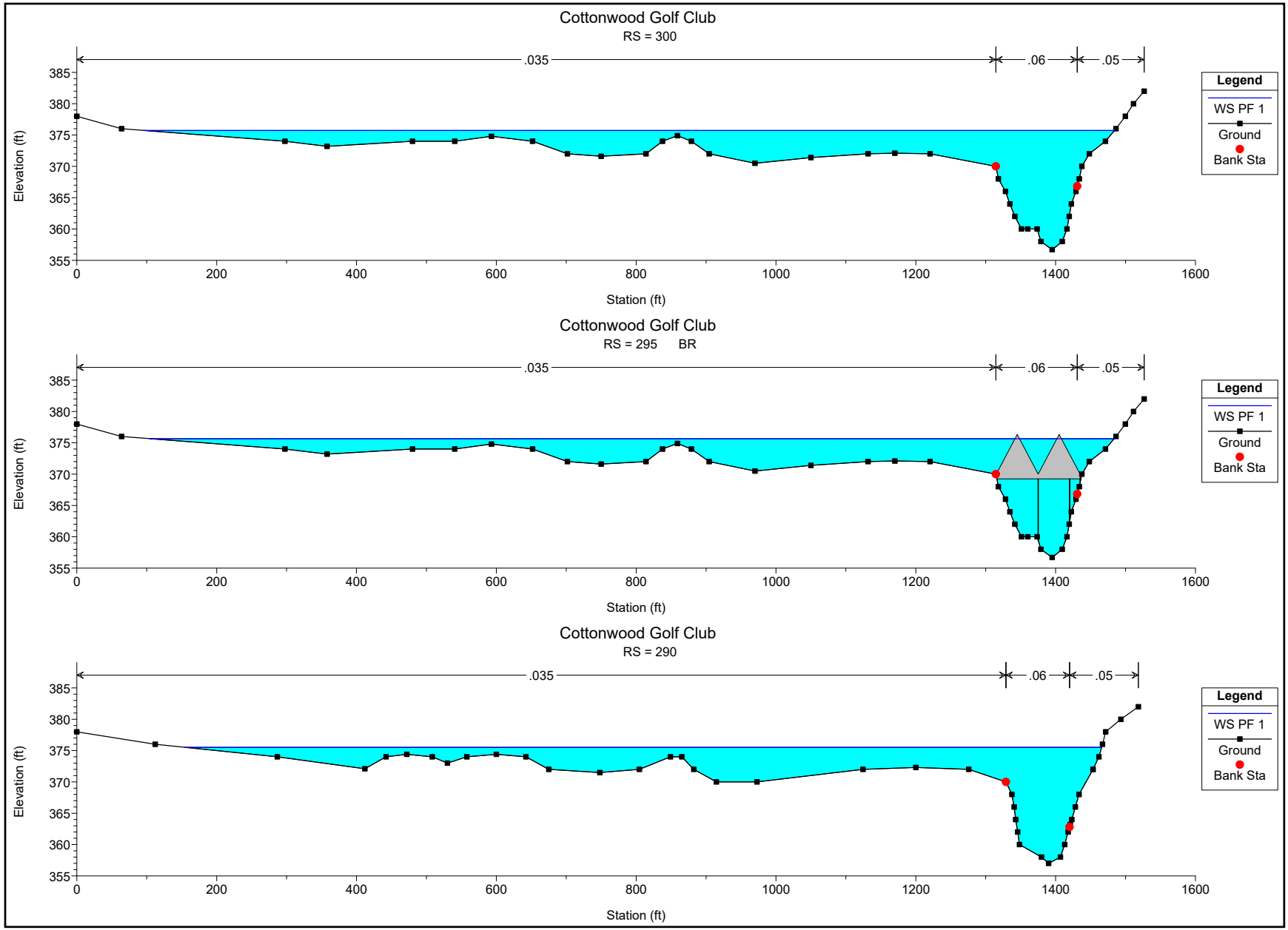
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	398	PF 1	29500.00	371.30	383.17	383.17	387.25	0.008936	16.52	1955.33	346.72	0.90
Reach-1	396	PF 1	29500.00	367.40	378.38		378.59	0.000584	4.20	9721.67	1635.85	0.23
Reach-1	394.1	PF 1	29500.00	365.90	377.81		378.32	0.001542	7.14	6838.40	1679.65	0.38
Reach-1	320	PF 1	29500.00	360.00	376.30	371.89	376.73	0.001952	6.59	6279.88	1549.75	0.30
Reach-1	315		Culvert									
Reach-1	310	PF 1	29500.00	358.00	376.28		376.58	0.001332	5.57	7123.00	1526.89	0.25
Reach-1	300	PF 1	29500.00	356.70	375.73	374.22	376.36	0.003003	7.94	5237.41	1389.15	0.37
Reach-1	295		Bridge									
Reach-1	290	PF 1	29500.00	357.00	375.52		376.15	0.003116	8.26	5088.77	1311.24	0.37
Reach-1	280	PF 1	29500.00	354.60	372.00	372.00	374.39	0.006896	15.00	2918.15	813.73	0.79
Reach-1	270	PF 1	29500.00	351.30	370.66	370.66	372.55	0.002422	13.13	3851.40	1241.65	0.64
Reach-1	260	PF 1	29500.00	349.90	367.90	367.90	369.70	0.002600	12.88	3797.93	1077.01	0.66
Reach-1	250	PF 1	29500.00	347.70	365.45	364.94	366.95	0.001994	11.11	3999.68	969.47	0.58
Reach-1	245		Bridge									
Reach-1	240	PF 1	29500.00	347.70	365.17	364.86	366.84	0.002206	11.59	3803.53	935.87	0.60
Reach-1	230	PF 1	29500.00	346.00	364.37	363.81	366.11	0.002020	11.89	3721.92	994.34	0.59
Reach-1	225		Bridge									
Reach-1	220	PF 1	29500.00	346.00	363.65	363.65	365.71	0.002465	12.78	3291.45	896.21	0.64
Reach-1	210	PF 1	29500.00	345.00	356.97		357.29	0.002732	4.55	6483.13	588.28	0.24
Reach-1	200	PF 1	29500.00	345.00	356.90		357.23	0.002830	4.61	6397.23	578.25	0.24
Reach-1	190	PF 1	29500.00	344.00	355.37		355.81	0.003686	5.27	5619.94	589.24	0.29
Reach-1	180	PF 1	29500.00	343.20	354.12		354.41	0.003137	4.33	6933.46	926.23	0.24
Reach-1	170	PF 1	29500.00	342.10	351.69		352.44	0.007351	7.00	4305.24	580.28	0.43
Reach-1	160	PF 1	29500.00	342.00	351.56	347.86	352.32	0.007737	7.08	4274.74	592.05	0.44
Reach-1	150	PF 1	29500.00	340.40	349.73		349.95	0.003184	3.84	8062.17	1158.98	0.23
Reach-1	140	PF 1	29500.00	338.00	349.44		349.66	0.000343	1.20	11684.50	1320.25	0.07
Reach-1	130	PF 1	29500.00	337.30	348.46	345.10	349.33	0.001372	7.64	4039.56	1122.09	0.46
Reach-1	125		Mult Open									
Reach-1	120	PF 1	29500.00	338.10	346.46	346.46	348.93	0.007768	12.80	2359.51	982.82	1.01
Reach-1	110	PF 1	29500.00	334.00	342.69		342.93	0.001323	3.97	7431.45	1017.85	0.26
Reach-1	100	PF 1	29500.00	332.20	341.94		342.22	0.002151	3.79	7249.99	866.61	0.22
Reach-1	90	PF 1	29500.00	331.00	340.53		340.79	0.002873	4.11	7209.08	1000.04	0.24
Reach-1	80	PF 1	29500.00	331.00	340.45		340.72	0.002908	4.12	7205.16	1036.12	0.24
Reach-1	70	PF 1	29500.00	329.80	339.28		339.50	0.002975	3.76	7799.26	1156.97	0.22
Reach-1	60	PF 1	29500.00	329.80	339.21		339.43	0.003037	3.63	7955.90	1166.75	0.21
Reach-1	50	PF 1	29500.00	326.00	337.28		337.62	0.004460	5.39	6378.49	1064.31	0.31
Reach-1	40	PF 1	29500.00	324.00	335.63		335.91	0.002460	4.55	7081.80	1096.53	0.27
Reach-1	30	PF 1	29500.00	324.00	334.80		335.01	0.001108	2.70	8251.28	1142.26	0.16

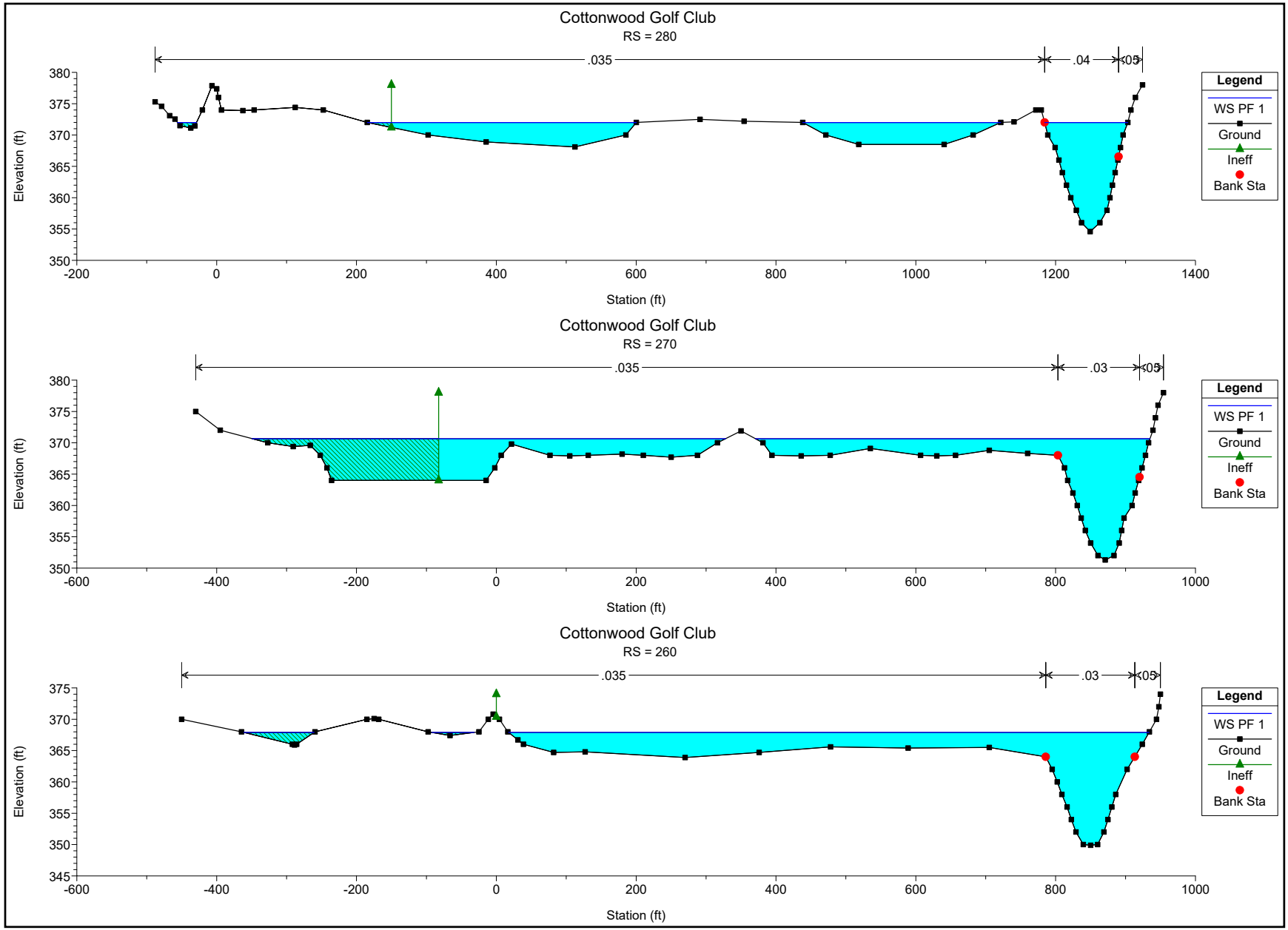
HEC-RAS Plan: PC Phase 2 River: RIVER-1 Reach: Reach-1 Profile: PF 1 (Continued)

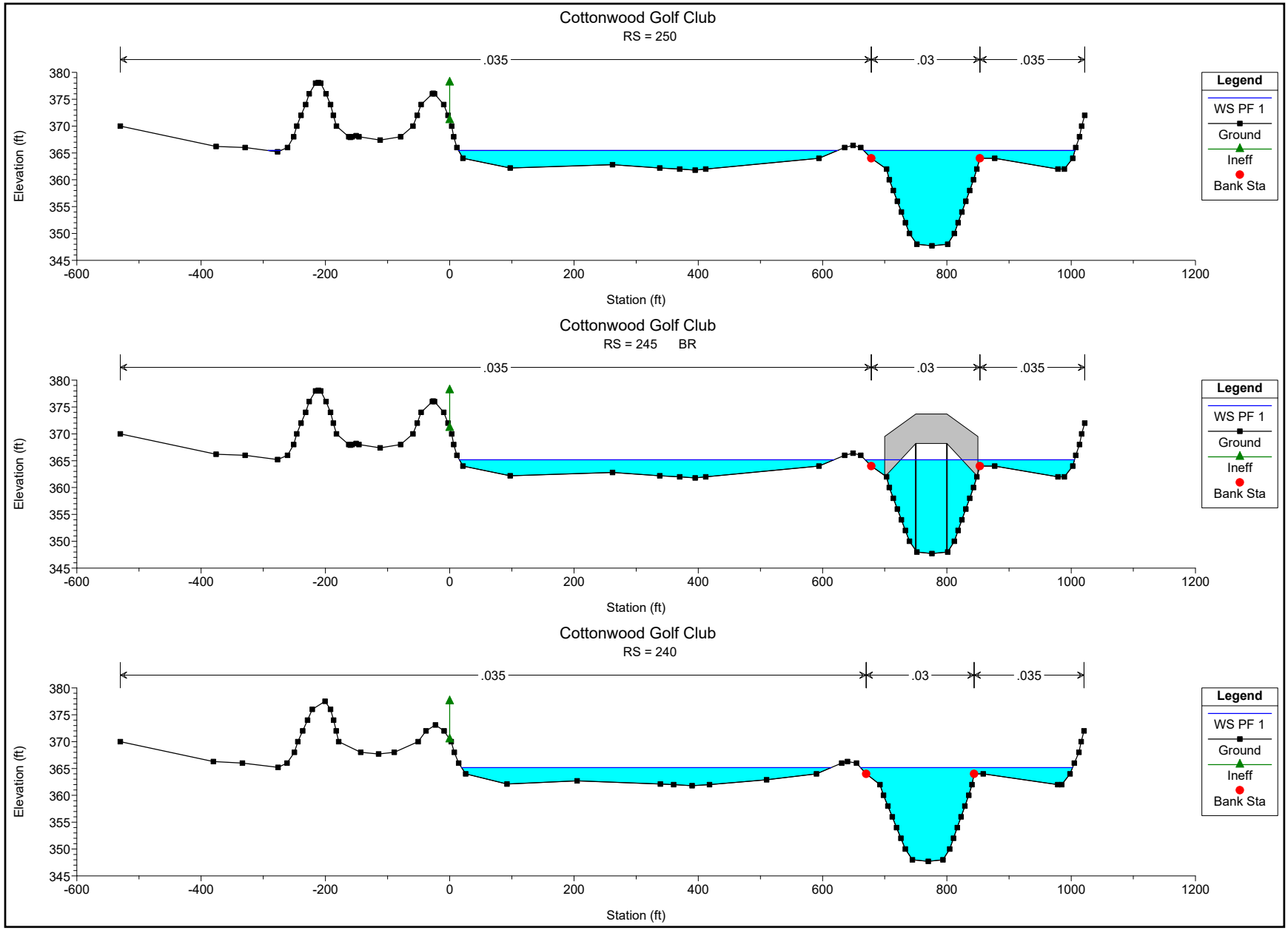
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	20	PF 1	29500.00	324.00	333.91		334.32	0.001881	4.77	5746.74	1011.29	0.34
Reach-1	10	PF 1	29500.00	324.00	333.75		334.26	0.002611	5.83	5166.49	1069.62	0.40
Reach-1	5	PF 1	29500.00	321.10	330.28	328.76	330.93	0.004294	10.82	5598.21	1123.72	0.68

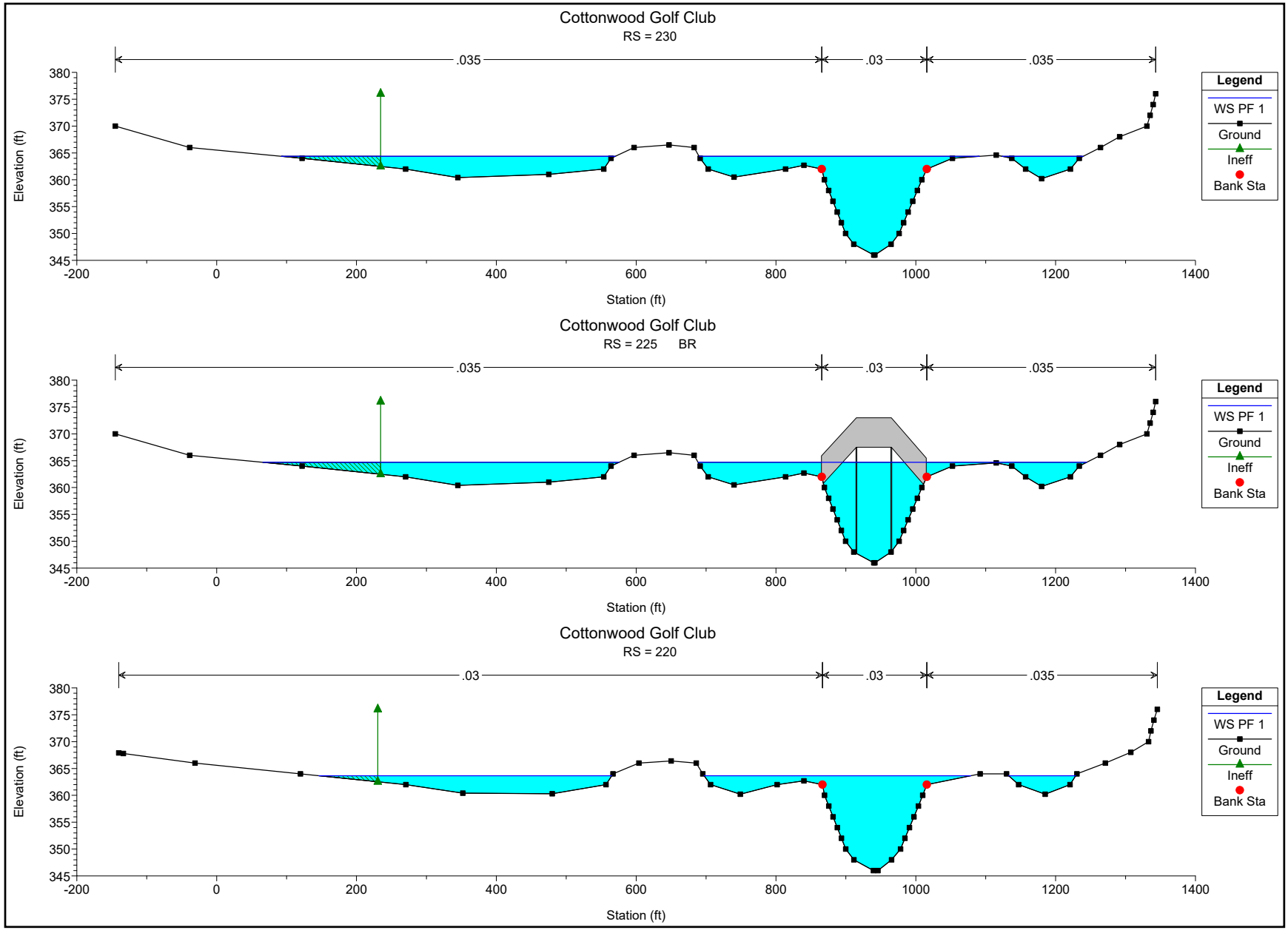

Cottonwood Golf Club
RS = 398
.05
.04
.05
Elevation (ft)
480
460
440
420
400
380
360
4000
4500
5000
5500
6000
6500
7000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 396
.05
.04
.05
Elevation (ft)
480
460
440
420
400
380
360
4000
4500
5000
5500
6000
6500
7000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 394.1
.05
.04
.05
Elevation (ft)
460
440
420
400
380
360
4000
4500
5000
5500
6000
6500
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta

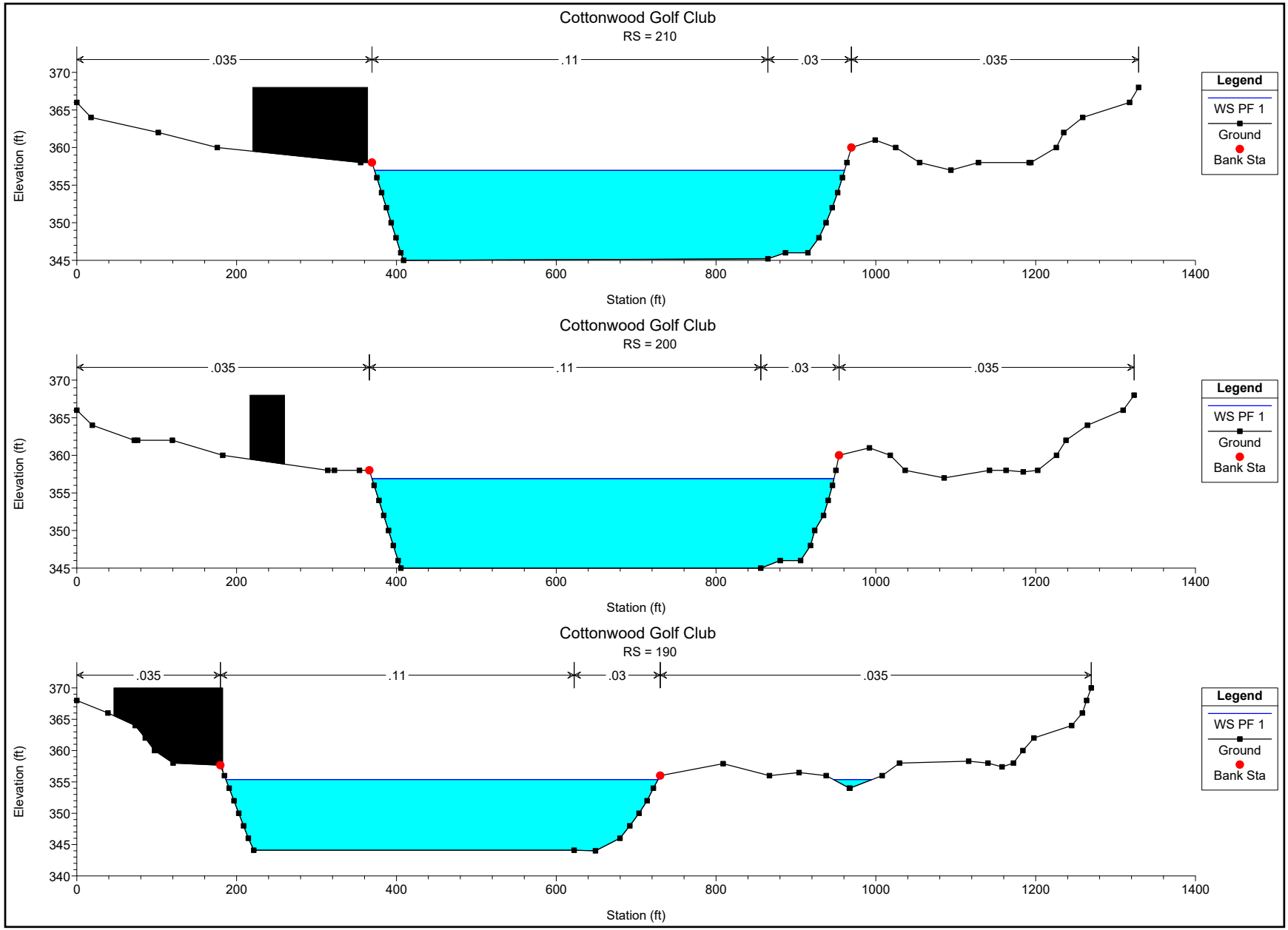

Cottonwood Golf Club
RS = 320
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
-200
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 315 Culv
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
-200
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 310
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
355
-200
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

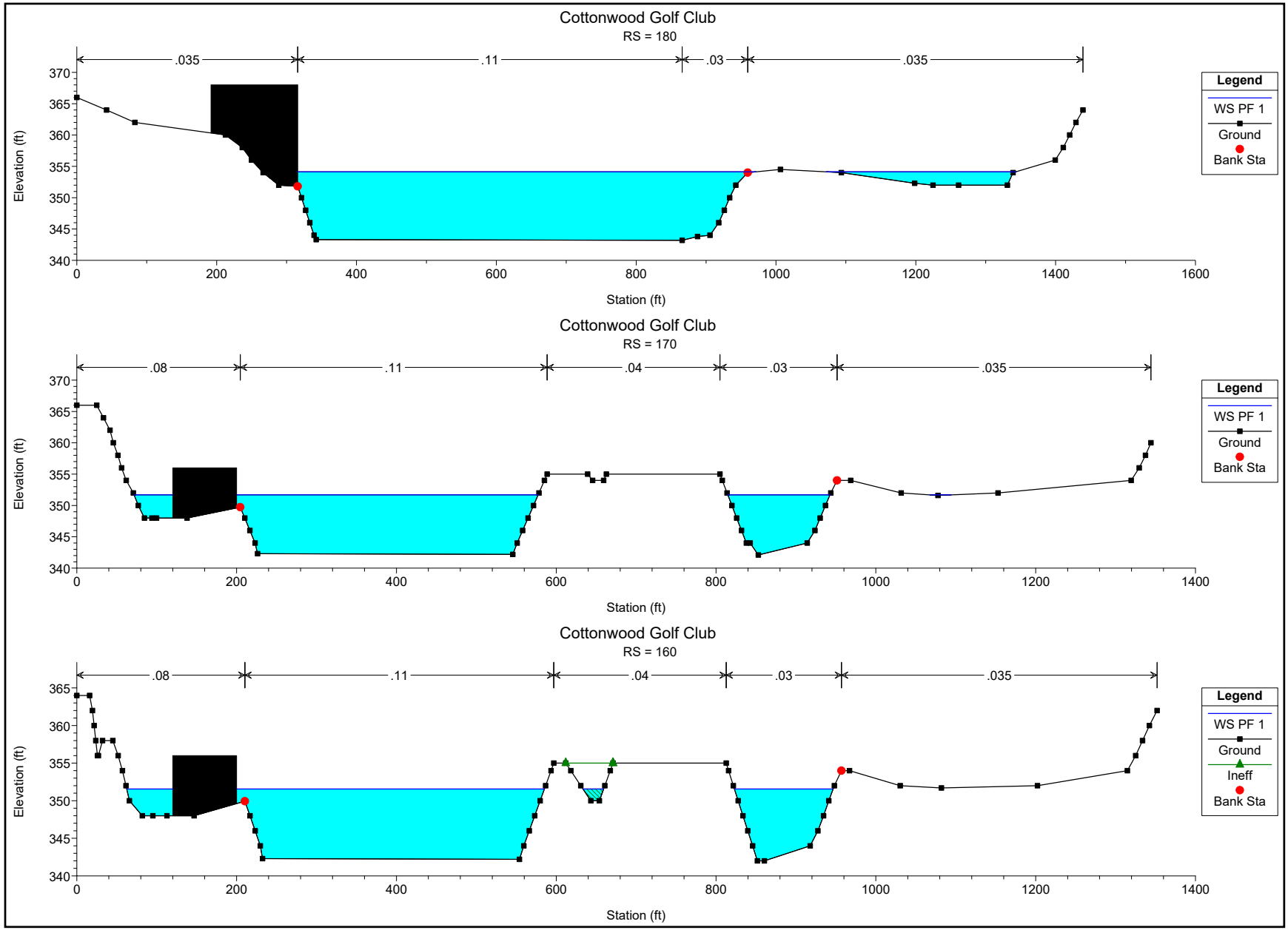

Cottonwood Golf Club
RS = 300
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
355
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 295 BR
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
355
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 290
.035
.06
.05
Elevation (ft)
385
380
375
370
365
360
355
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

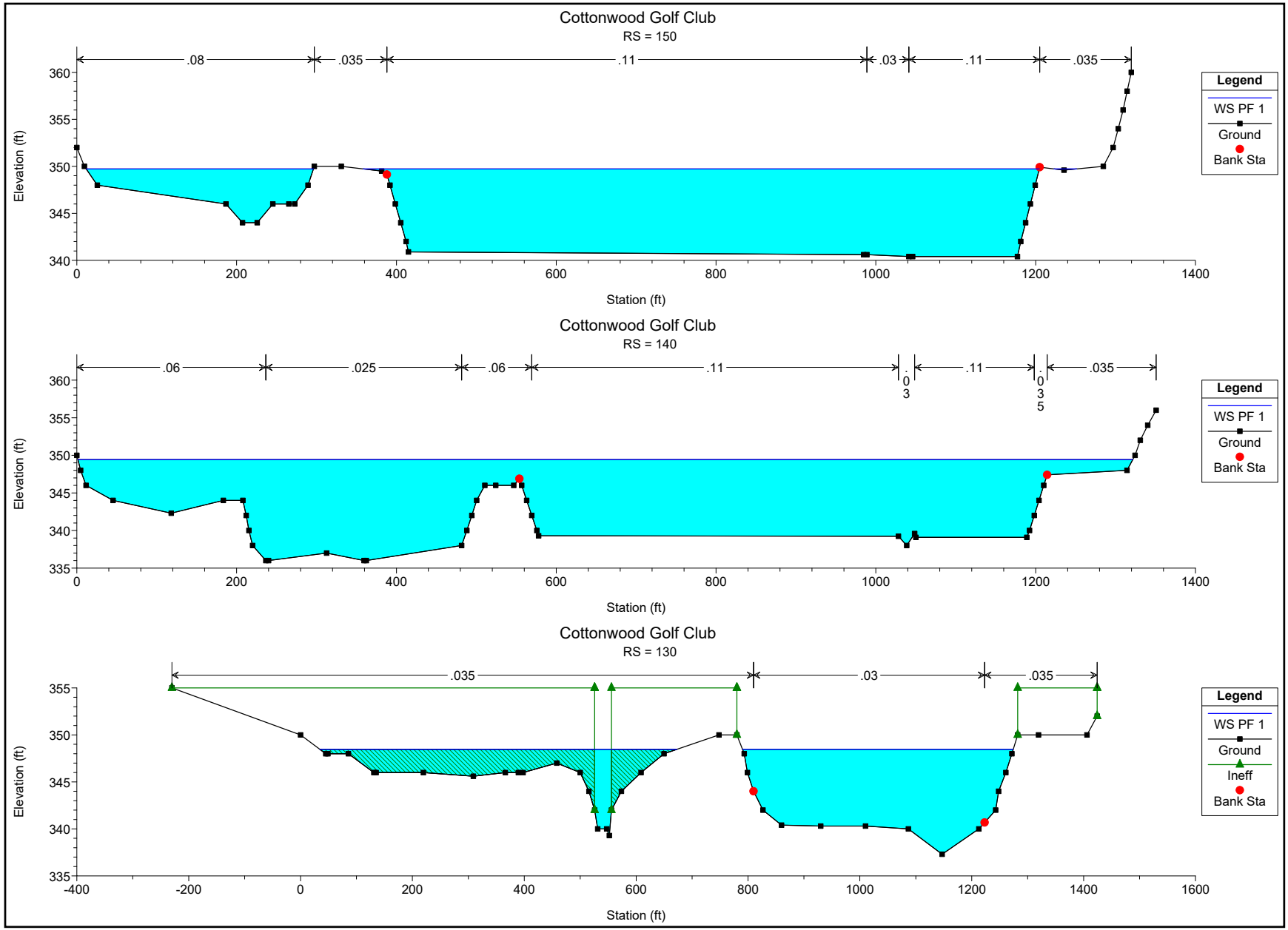

Cottonwood Golf Club
RS = 280
.035
.04
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 270
.035
.03
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 260
.035
.03
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta

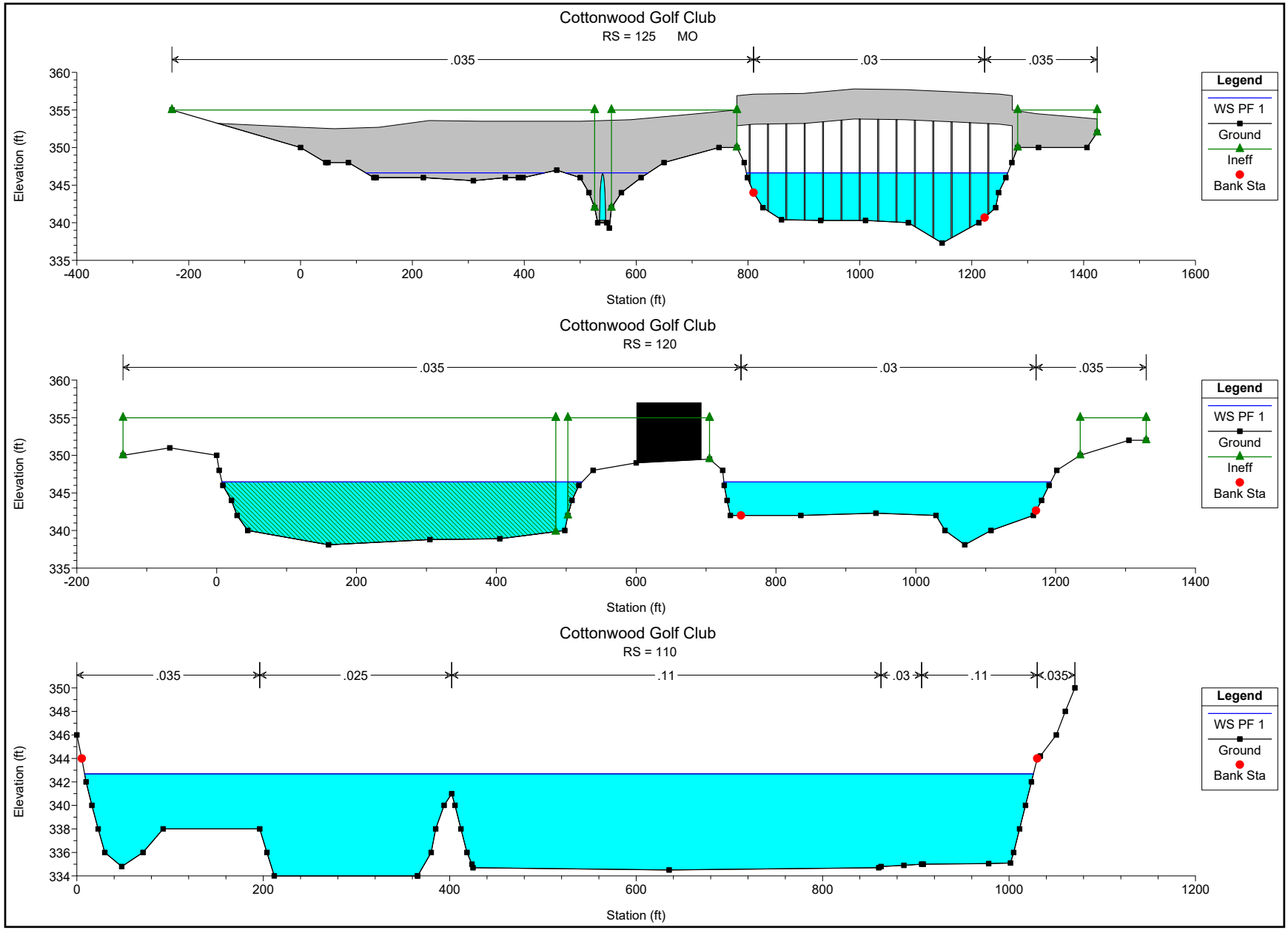

Cottonwood Golf Club
RS = 250
.035
.03
.035
Elevation (ft)
380
375
370
365
360
355
350
345
-600
-400
-200
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 245 BR
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 240
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta

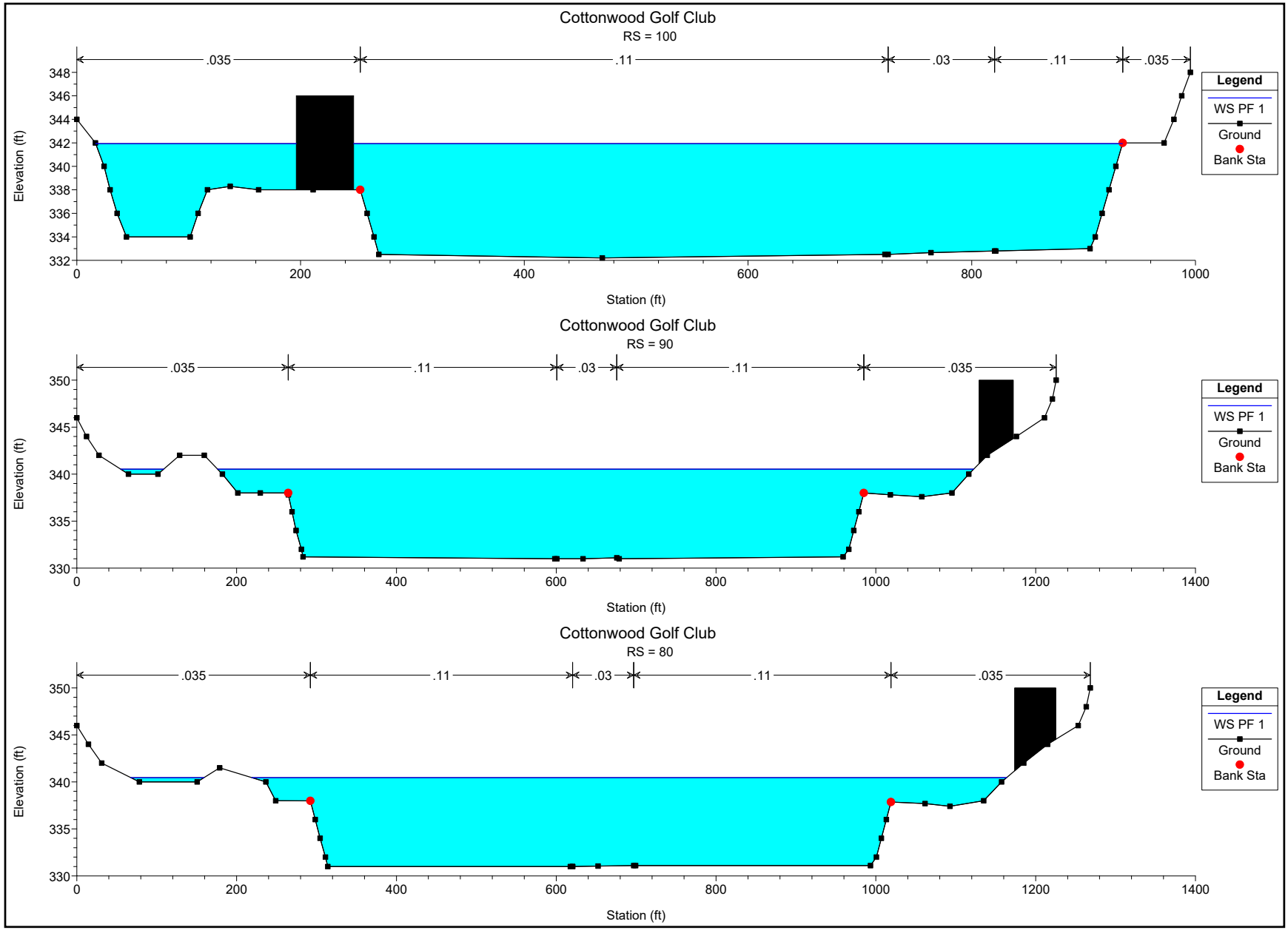

Cottonwood Golf Club
RS = 230
.035
.03
.035
Elevation (ft)
380
375
370
365
360
355
350
345
-200
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 225 BR
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 220
.03
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta

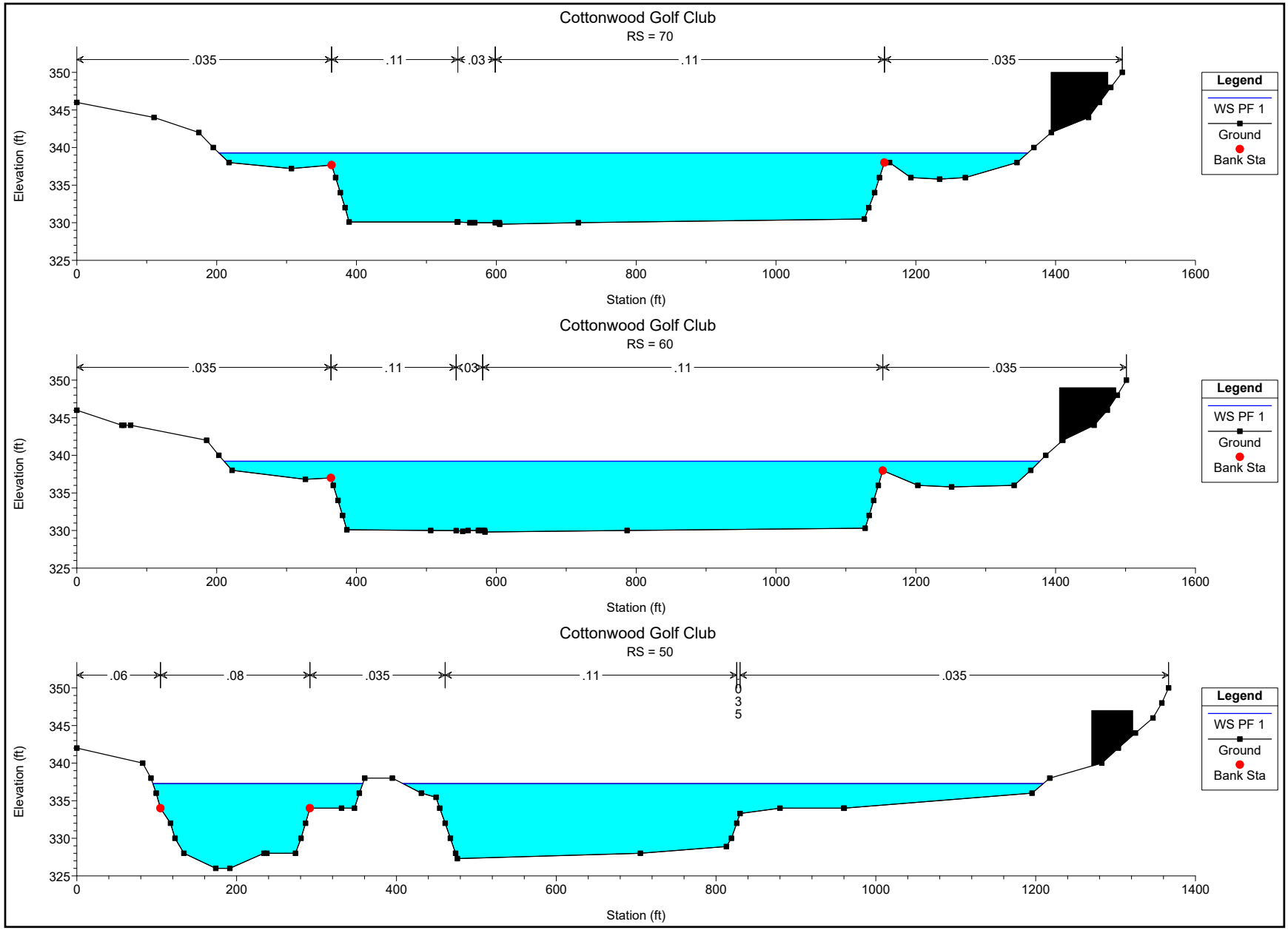

Cottonwood Golf Club
RS = 210
.035
.11
.03
.035
Elevation (ft)
370
365
360
355
350
345
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 200
.035
.11
.03
.035
Elevation (ft)
370
365
360
355
350
345
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 190
.035
.11
.03
.035
Elevation (ft)
370
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

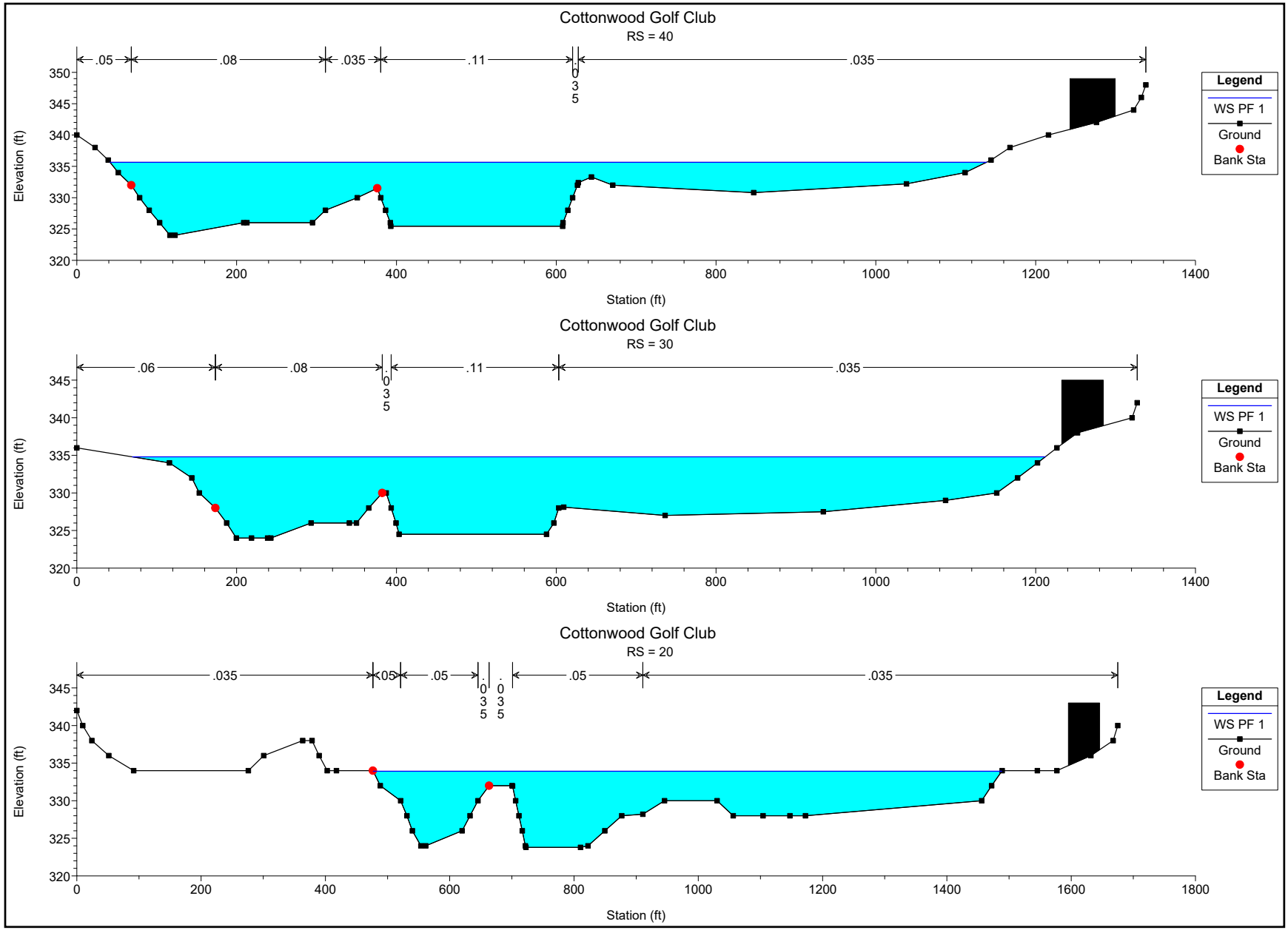

Cottonwood Golf Club
RS = 180
.035
.11
.03
.035
Elevation (ft)
370
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 170
.08
.11
.04
.03
.035
Elevation (ft)
370
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 160
.08
.11
.04
.03
.035
Elevation (ft)
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta

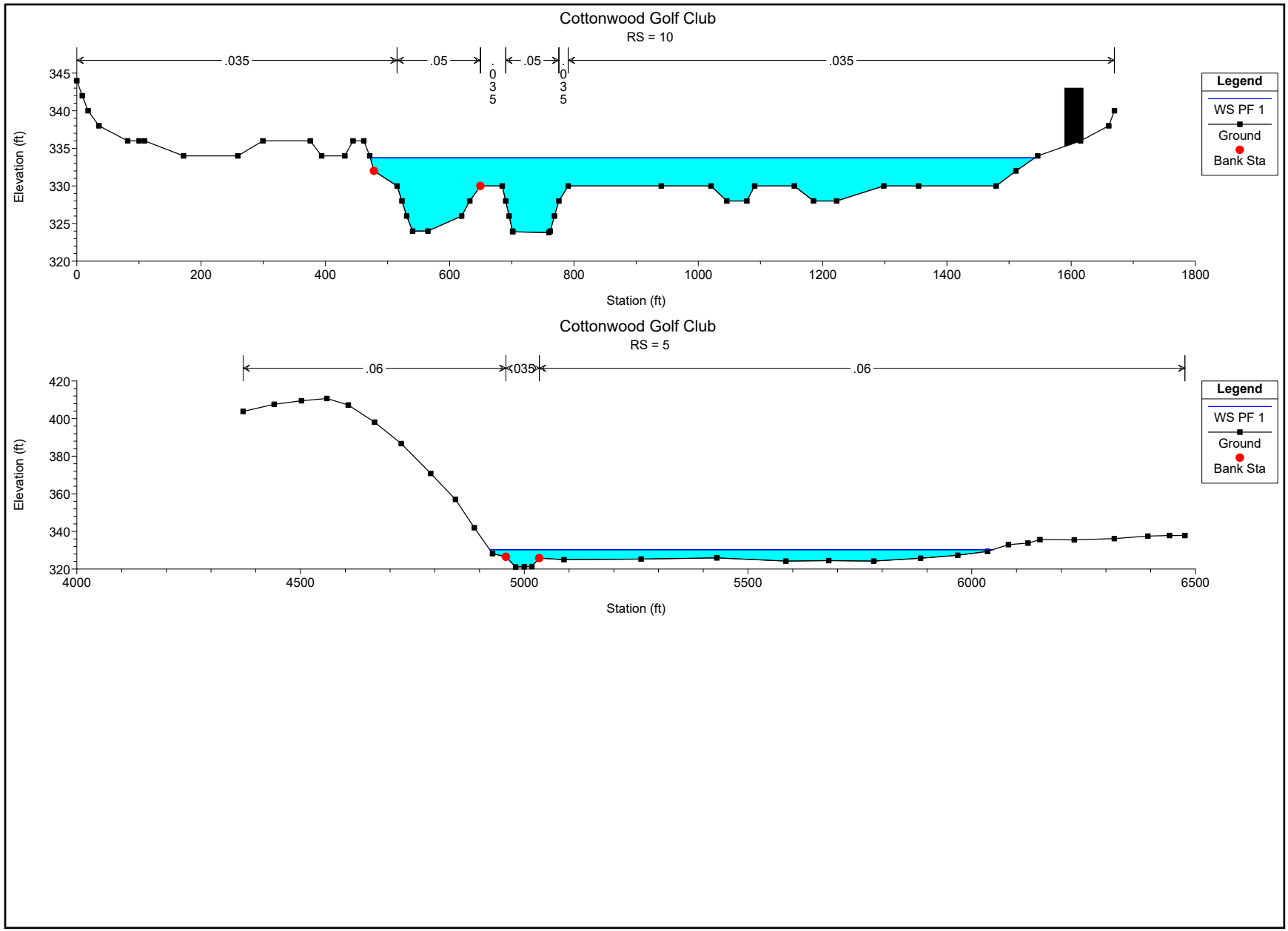

Cottonwood Golf Club
RS = 150
.08
.035
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 140
.06
.025
.06
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 130
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta


Cottonwood Golf Club
RS = 125 MO
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 120
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 110
.035
.025
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 100
.035
.11
.03
.11
.035
Elevation (ft)
348
346
344
342
340
338
336
334
332
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 90
.035
.11
.03
.11
.035
Elevation (ft)
350
345
340
335
330
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 80
.035
.11
.03
.11
.035
Elevation (ft)
350
345
340
335
330
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 70
.035
.11
.03
.11
.035
Elevation (ft)
350
345
340
335
330
325
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 60
.035
.11
.03
.11
.035
Elevation (ft)
350
345
340
335
330
325
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 50
.06
.08
.035
.11
0
3
5
.035
Elevation (ft)
350
345
340
335
330
325
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 40
.05
.08
.035
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 30
.06
.08
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 20
.035
.05
.05
.05
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 10
.035
.05
.035
.05
.035
Elevation (ft)
345
340
335
330
325
320
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 5
.06
.035
.06
Elevation (ft)
420
400
380
360
340
320
4000
4500
5000
5500
6000
6500
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

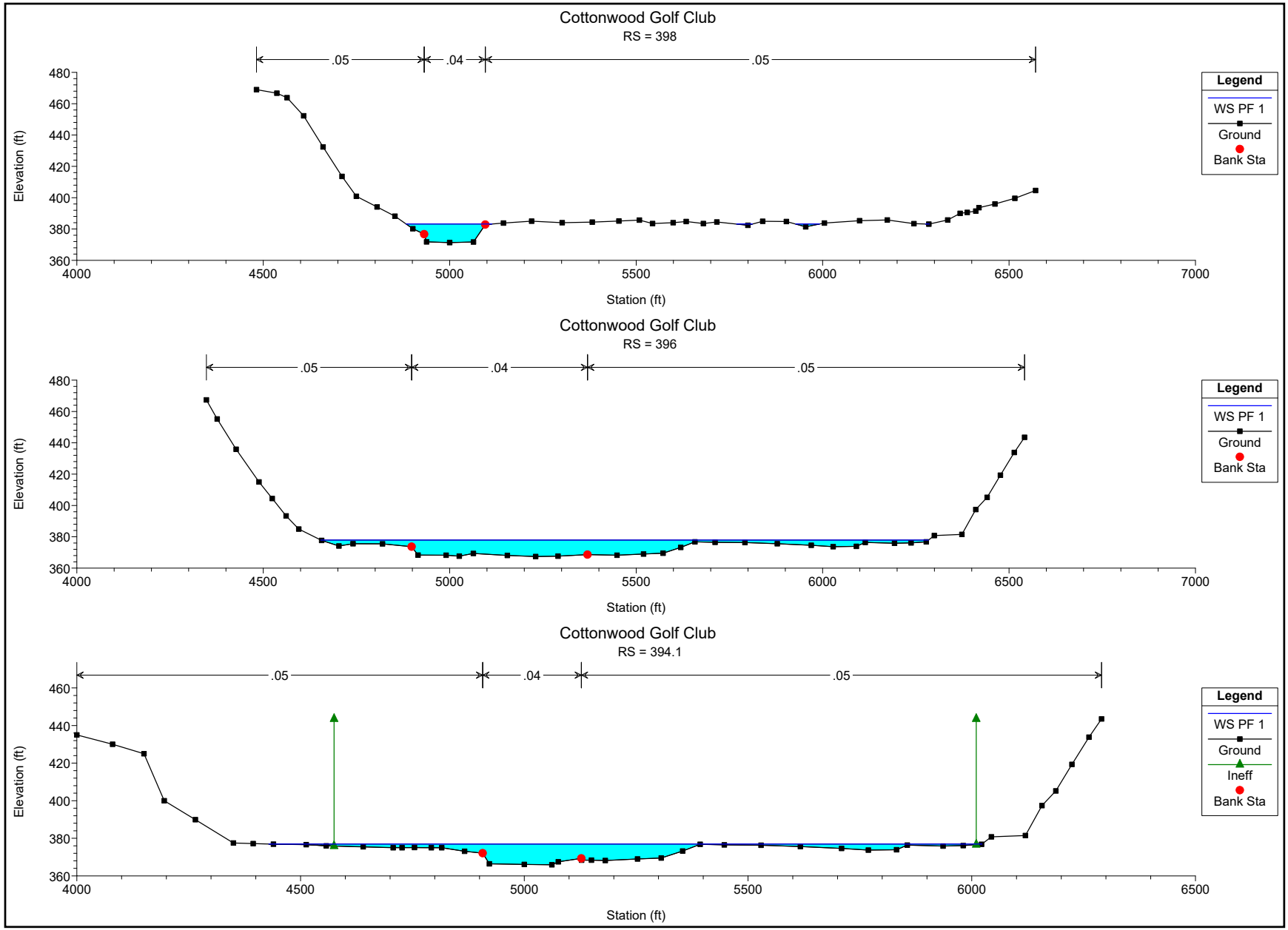
Mining Phase 3

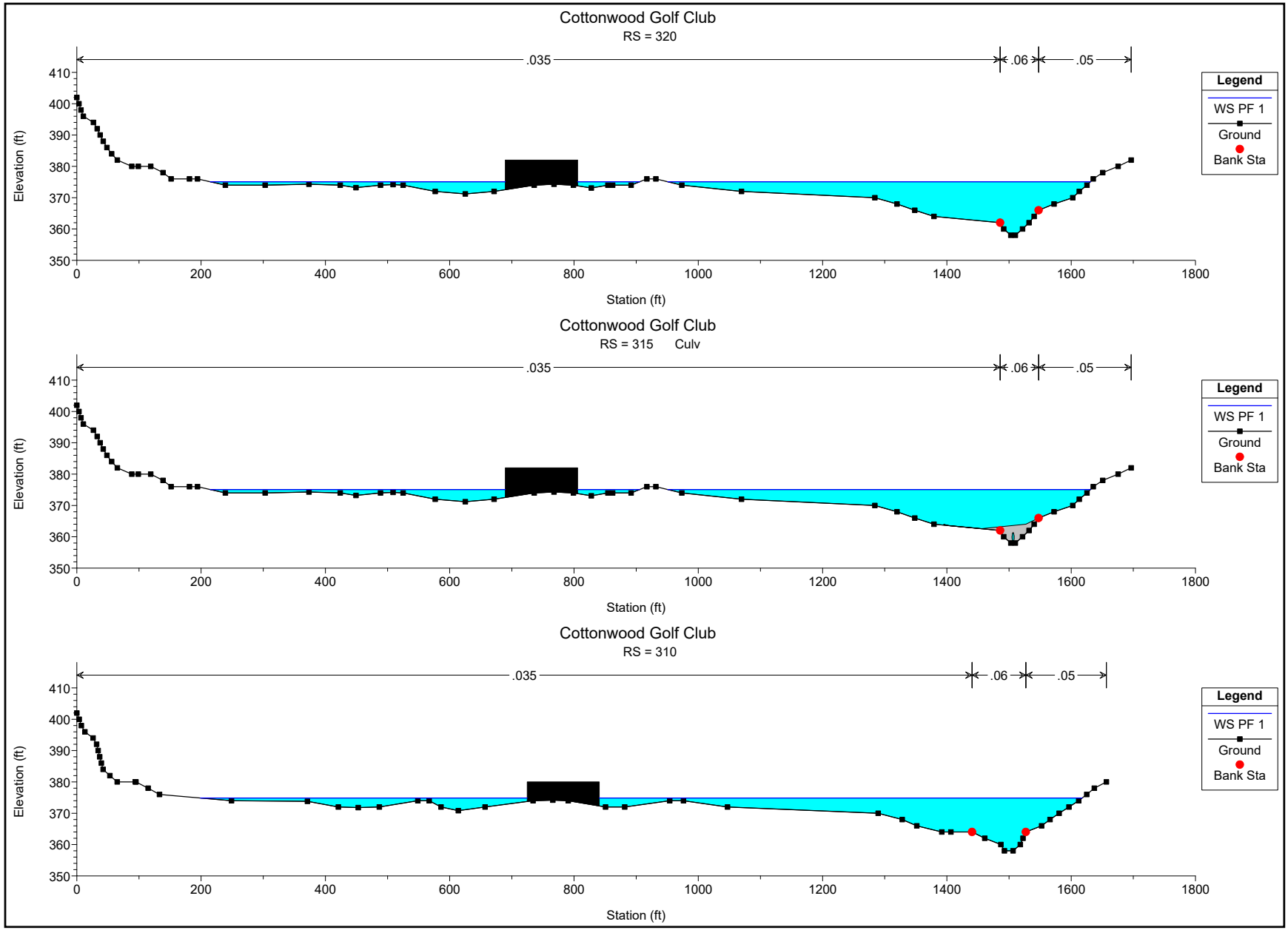
HEC-RAS Plan: PC Phase 3 River: RIVER-1 Reach: Reach-1 Profile: PF 1

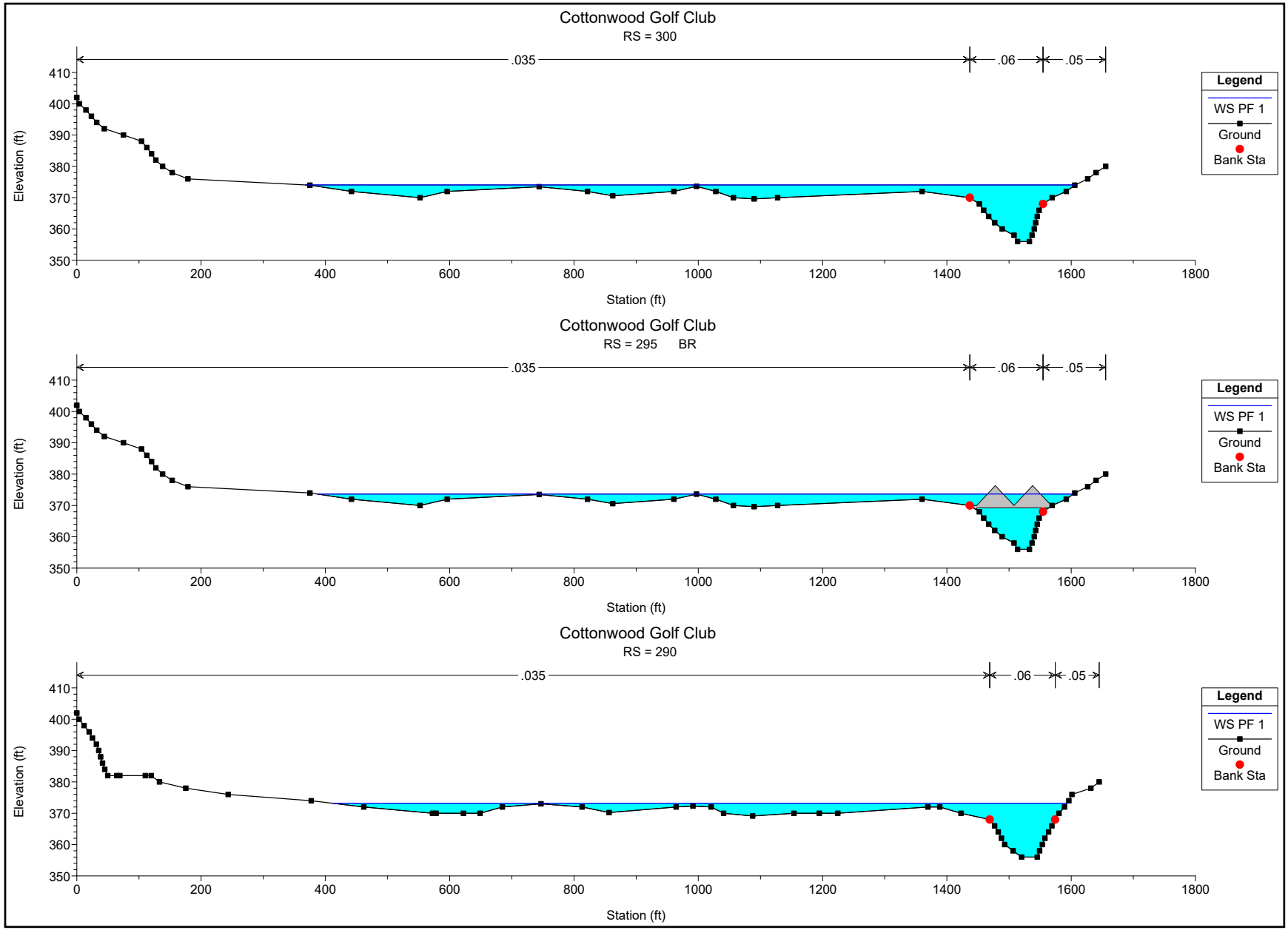
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	398	PF 1	29500.00	371.30	383.17	383.17	387.25	0.008936	16.52	1955.33	346.72	0.90
Reach-1	396	PF 1	29500.00	367.40	377.94		378.18	0.000724	4.54	8995.08	1629.67	0.26
Reach-1	394.1	PF 1	29500.00	365.90	376.97		377.78	0.002528	8.67	5635.37	1593.94	0.48
Reach-1	320	PF 1	29500.00	358.00	375.09	372.02	375.56	0.001994	6.47	5433.80	1255.25	0.30
Reach-1	315		Culvert									
Reach-1	310	PF 1	29500.00	358.00	374.86		375.36	0.002439	7.08	5417.09	1302.76	0.33
Reach-1	300	PF 1	29500.00	356.00	374.07	373.56	374.98	0.005361	9.41	4263.89	1238.66	0.47
Reach-1	295		Bridge									
Reach-1	290	PF 1	29500.00	356.00	373.18	373.18	374.44	0.006936	11.12	3758.37	1181.64	0.54
Reach-1	280	PF 1	29500.00	352.90	362.75		363.02	0.004761	4.19	7039.47	744.78	0.24
Reach-1	270	PF 1	29500.00	350.00	361.11		361.36	0.004000	3.99	7424.62	832.86	0.22
Reach-1	260	PF 1	29500.00	348.00	359.20		359.45	0.003794	4.01	7348.81	717.24	0.22
Reach-1	250	PF 1	29500.00	347.00	357.17		357.44	0.003283	4.18	7060.01	727.77	0.24
Reach-1	240	PF 1	29500.00	346.00	357.14		357.39	0.002917	4.02	7346.61	727.35	0.22
Reach-1	230	PF 1	29500.00	346.00	356.19		356.41	0.002637	3.74	7890.29	822.17	0.21
Reach-1	220	PF 1	29500.00	346.00	356.15		356.37	0.002616	3.71	7948.61	827.26	0.21
Reach-1	210	PF 1	29500.00	345.00	354.94		355.10	0.002289	3.27	9029.17	945.77	0.19
Reach-1	200	PF 1	29500.00	344.90	354.90		355.06	0.002211	3.23	9119.39	947.31	0.18
Reach-1	190	PF 1	29500.00	344.00	353.92		354.08	0.002214	3.22	9166.21	962.53	0.18
Reach-1	180	PF 1	29500.00	343.00	353.11		353.25	0.001947	2.95	9990.12	1030.26	0.17
Reach-1	170	PF 1	29500.00	341.90	351.66		351.93	0.005605	4.26	6984.19	836.42	0.25
Reach-1	160	PF 1	29500.00	341.10	351.58	345.90	351.85	0.005264	4.19	7114.03	870.56	0.25
Reach-1	150	PF 1	29500.00	340.40	349.73		349.95	0.003184	3.84	8062.17	1158.98	0.23
Reach-1	140	PF 1	29500.00	338.00	349.44		349.66	0.000343	1.20	11684.50	1320.25	0.07
Reach-1	130	PF 1	29500.00	337.30	348.46	345.10	349.33	0.001372	7.64	4039.56	1122.09	0.46
Reach-1	125		Mult Open									
Reach-1	120	PF 1	29500.00	338.10	346.46	346.46	348.93	0.007768	12.80	2359.51	982.82	1.01
Reach-1	110	PF 1	29500.00	334.00	342.69		342.93	0.001323	3.97	7431.45	1017.85	0.26
Reach-1	100	PF 1	29500.00	332.20	341.94		342.22	0.002151	3.79	7249.99	866.61	0.22
Reach-1	90	PF 1	29500.00	331.00	340.53		340.79	0.002873	4.11	7209.08	1000.04	0.24
Reach-1	80	PF 1	29500.00	331.00	340.45		340.72	0.002908	4.12	7205.16	1036.12	0.24
Reach-1	70	PF 1	29500.00	329.80	339.28		339.50	0.002975	3.76	7799.26	1156.97	0.22
Reach-1	60	PF 1	29500.00	329.80	339.21		339.43	0.003037	3.63	7955.90	1166.75	0.21
Reach-1	50	PF 1	29500.00	326.00	337.28		337.62	0.004460	5.39	6378.49	1064.31	0.31
Reach-1	40	PF 1	29500.00	324.00	335.63		335.91	0.002460	4.55	7081.80	1096.53	0.27
Reach-1	30	PF 1	29500.00	324.00	334.80		335.01	0.001108	2.70	8251.28	1142.26	0.16
Reach-1	20	PF 1	29500.00	324.00	333.91		334.32	0.001881	4.77	5746.74	1011.29	0.34
Reach-1	10	PF 1	29500.00	324.00	333.75		334.26	0.002611	5.83	5166.49	1069.62	0.40

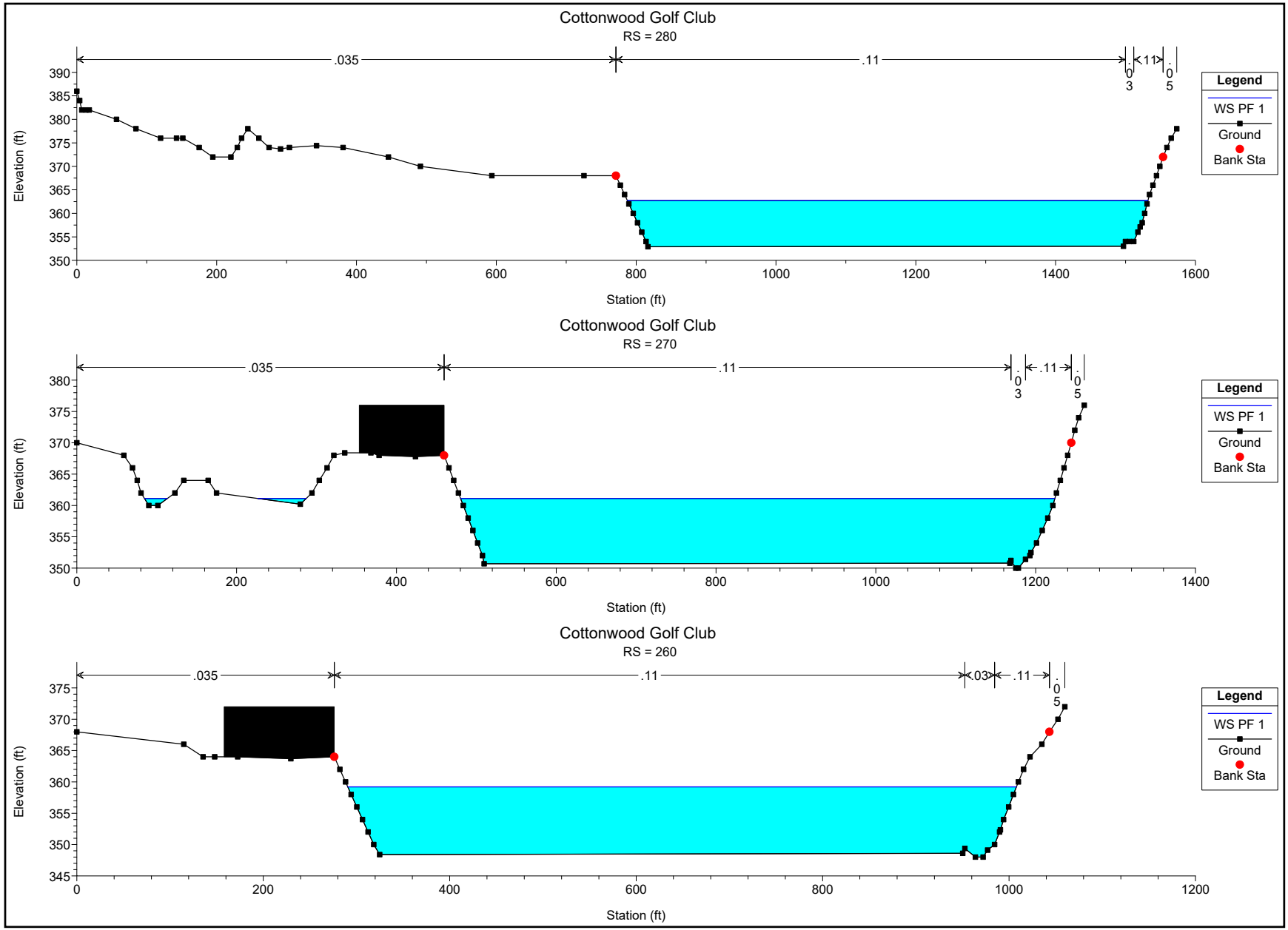
HEC-RAS Plan: PC Phase 3 River: RIVER-1 Reach: Reach-1 Profile: PF 1 (Continued)

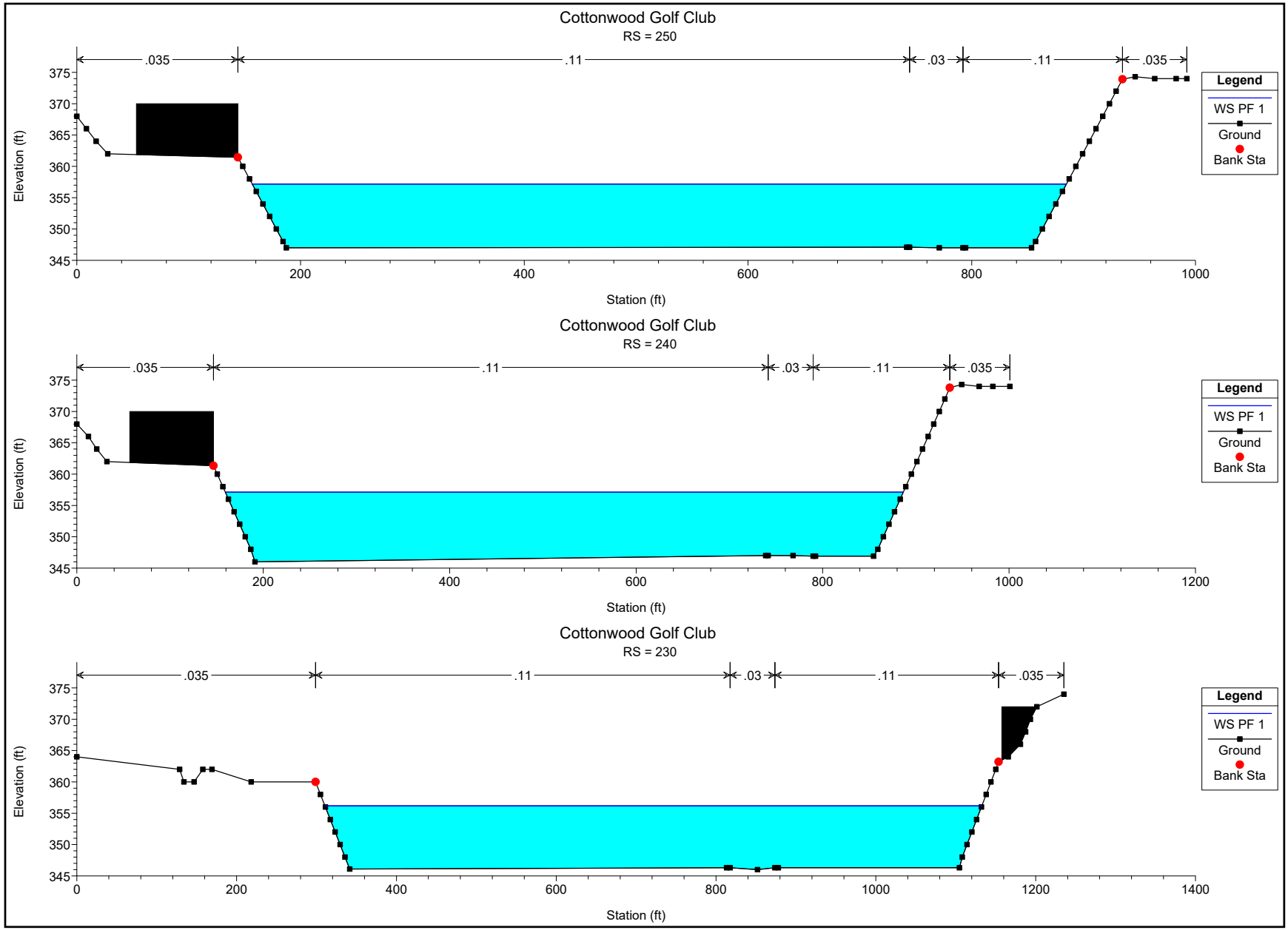
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	5	PF 1	29500.00	321.10	330.28	328.76	330.93	0.004294	10.82	5598.21	1123.72	0.68

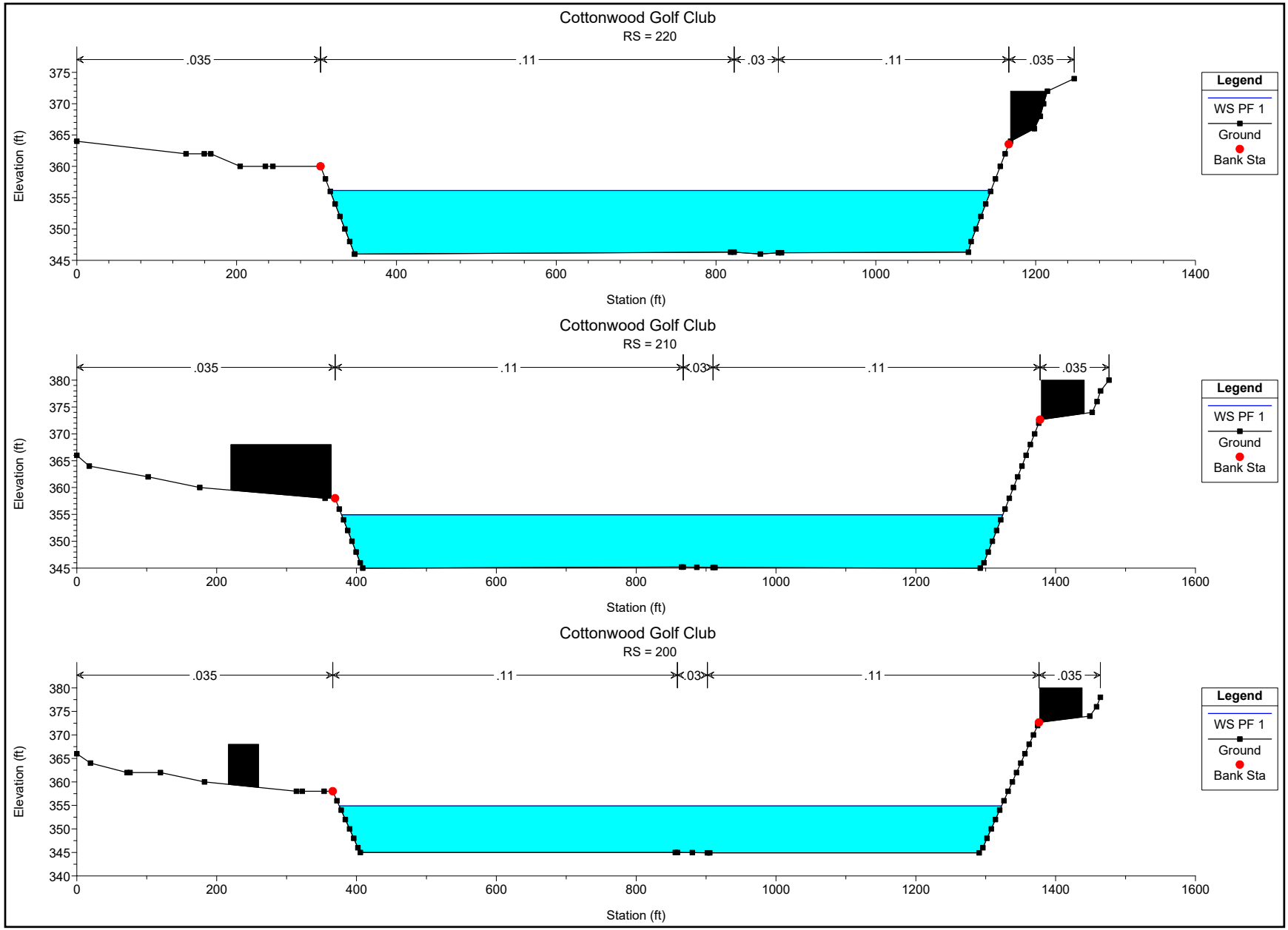

Cottonwood Golf Club
RS = 398
.05
.04
.05
Elevation (ft)
480
460
440
420
400
380
360
4000
4500
5000
5500
6000
6500
7000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 396
.05
.04
.05
Elevation (ft)
480
460
440
420
400
380
360
4000
4500
5000
5500
6000
6500
7000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 394.1
.05
.04
.05
Elevation (ft)
460
440
420
400
380
360
4000
4500
5000
5500
6000
6500
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta

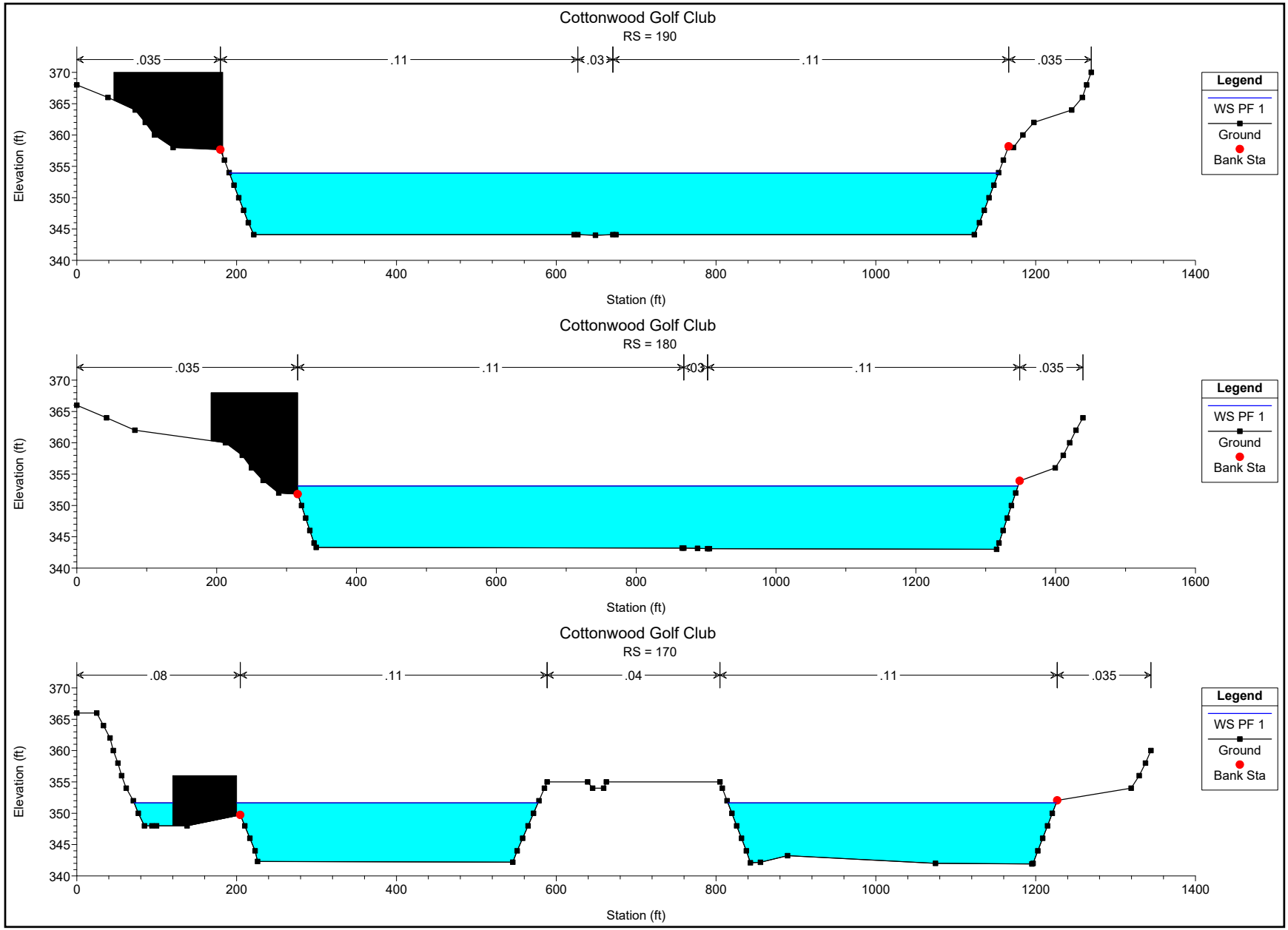

Cottonwood Golf Club
RS = 320
.035
.06
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 315 Culv
.035
.06
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 310
.035
.06
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

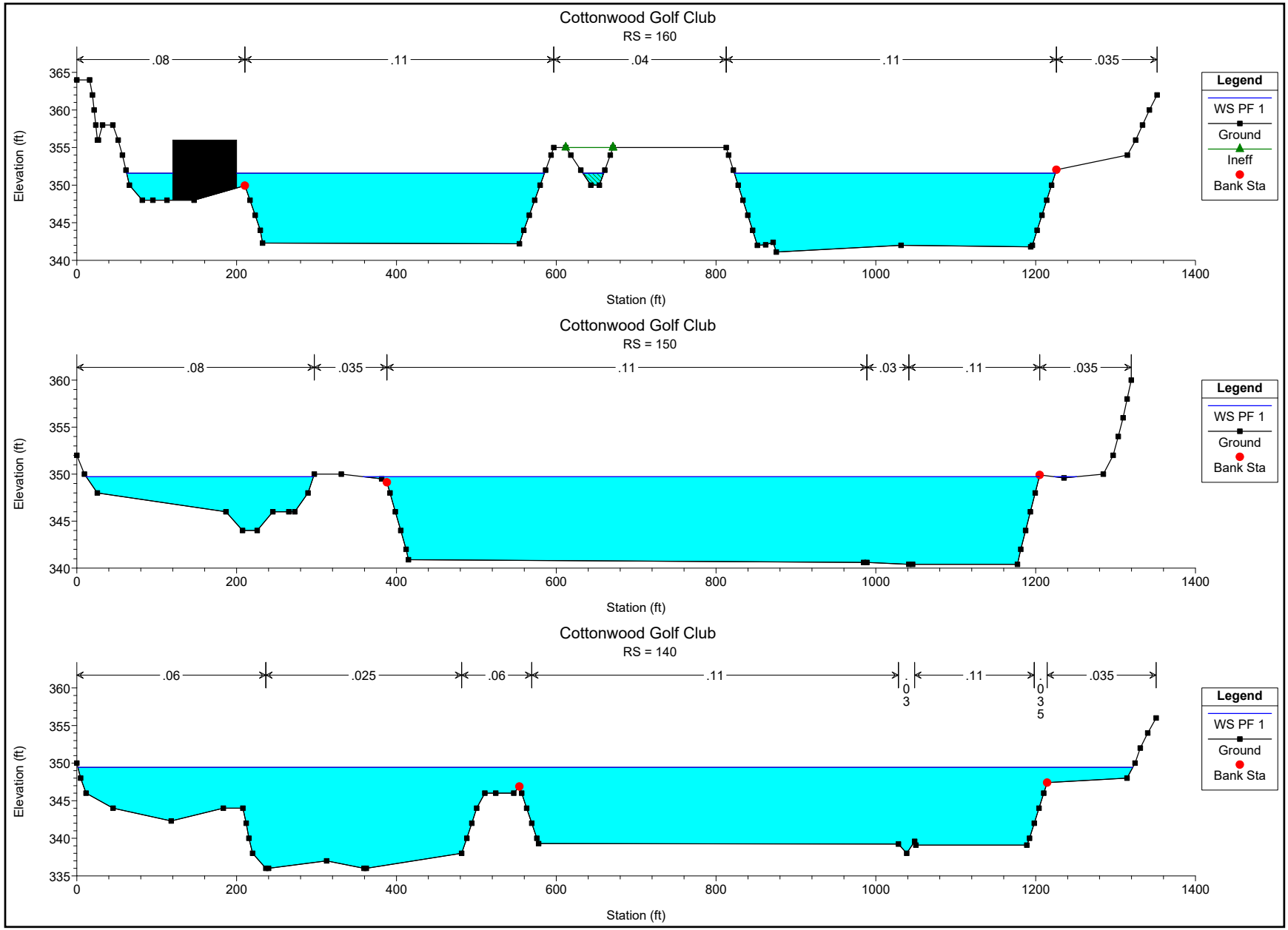

Cottonwood Golf Club
RS = 300
.035
.06
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 295 BR
.035
.06
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 290
.035
.06
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

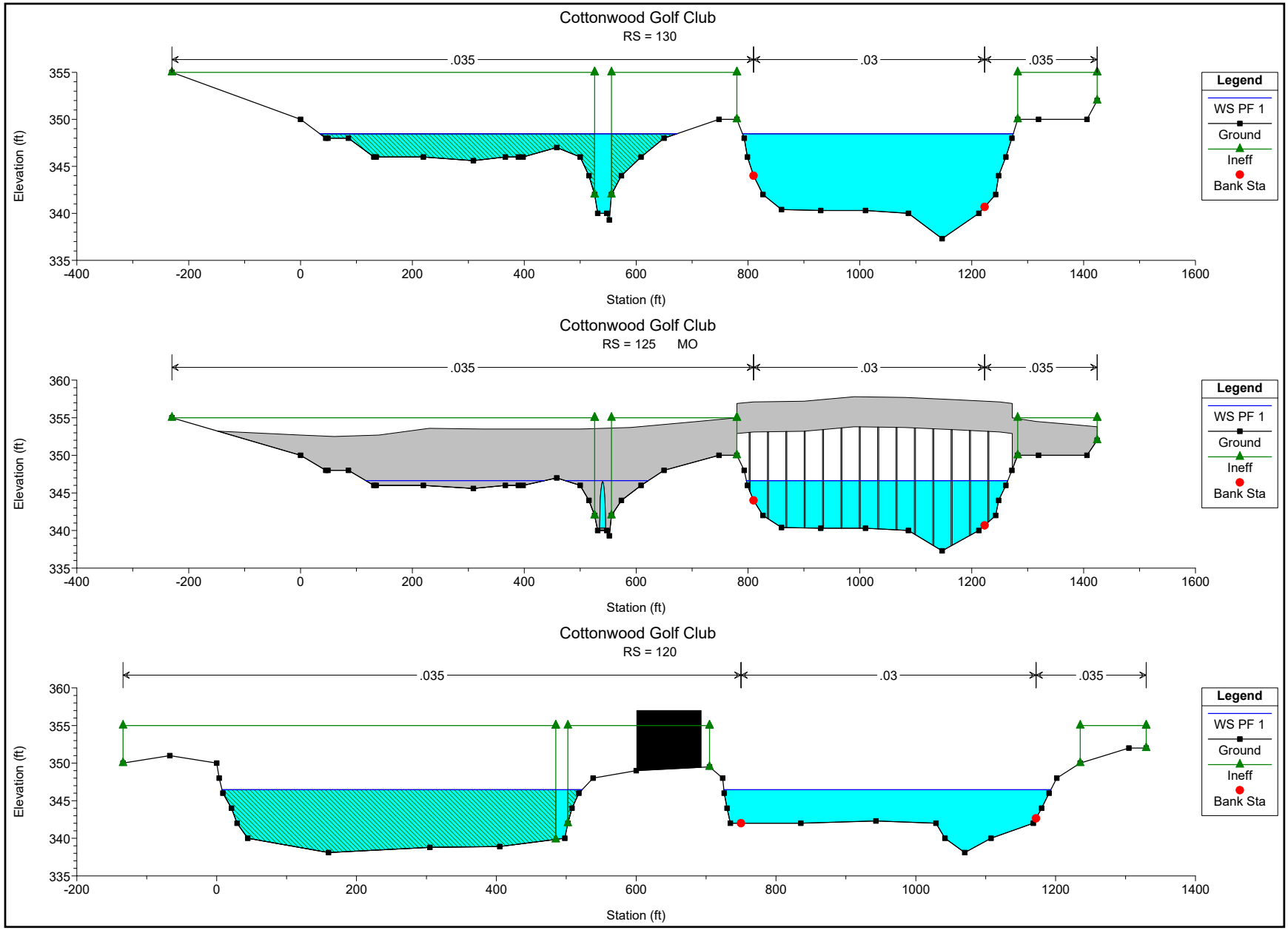

Cottonwood Golf Club
RS = 280
.035
.11
.03
.11
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 270
.035
.11
.03
.11
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 260
.035
.11
.03
.11
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

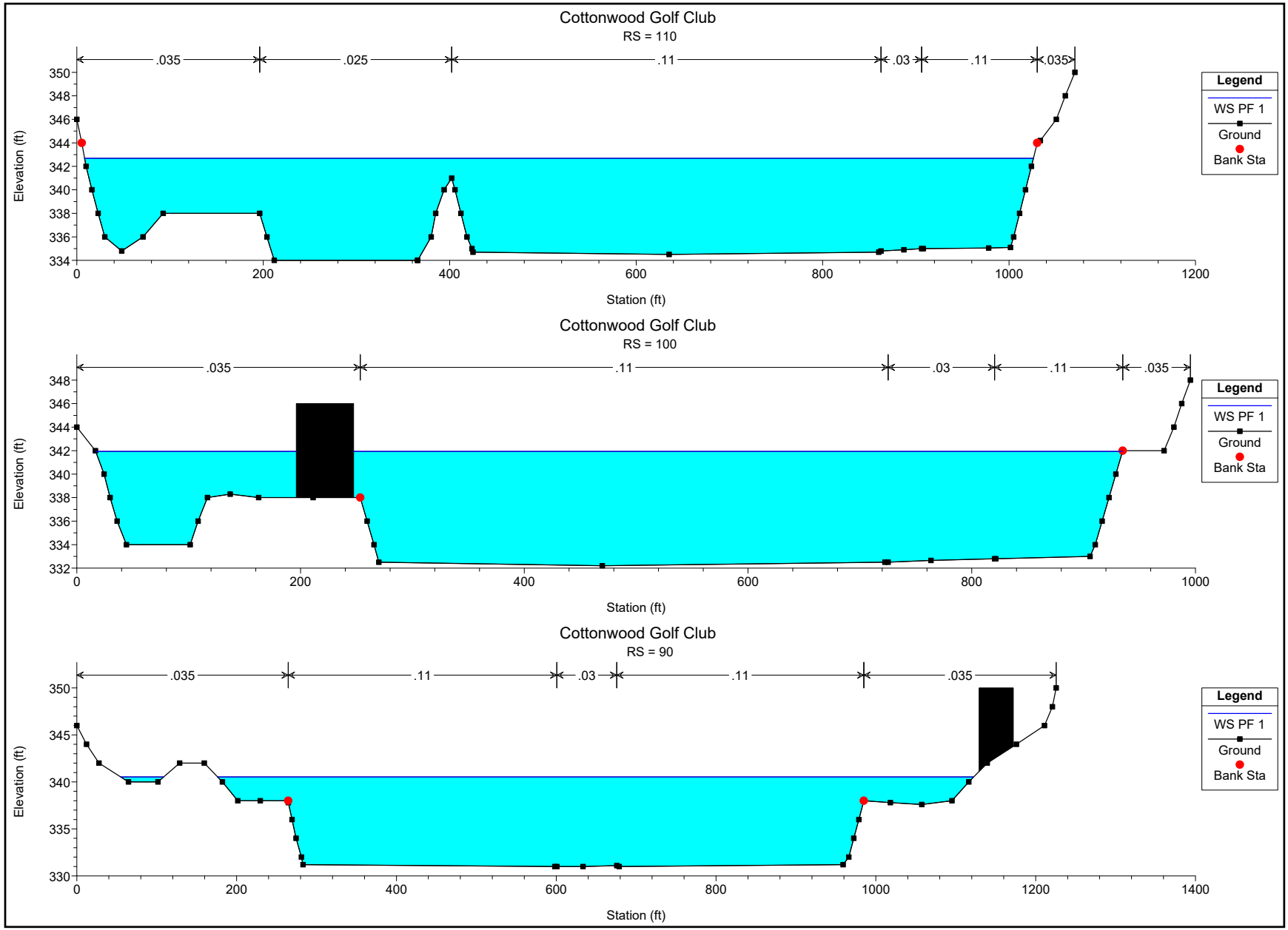

Cottonwood Golf Club
RS = 250
.035
.11
.03
.11
.035
Elevation (ft)
375
370
365
360
355
350
345
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 240
.035
.11
.03
.11
.035
Elevation (ft)
375
370
365
360
355
350
345
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 230
.035
.11
.03
.11
.035
Elevation (ft)
375
370
365
360
355
350
345
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

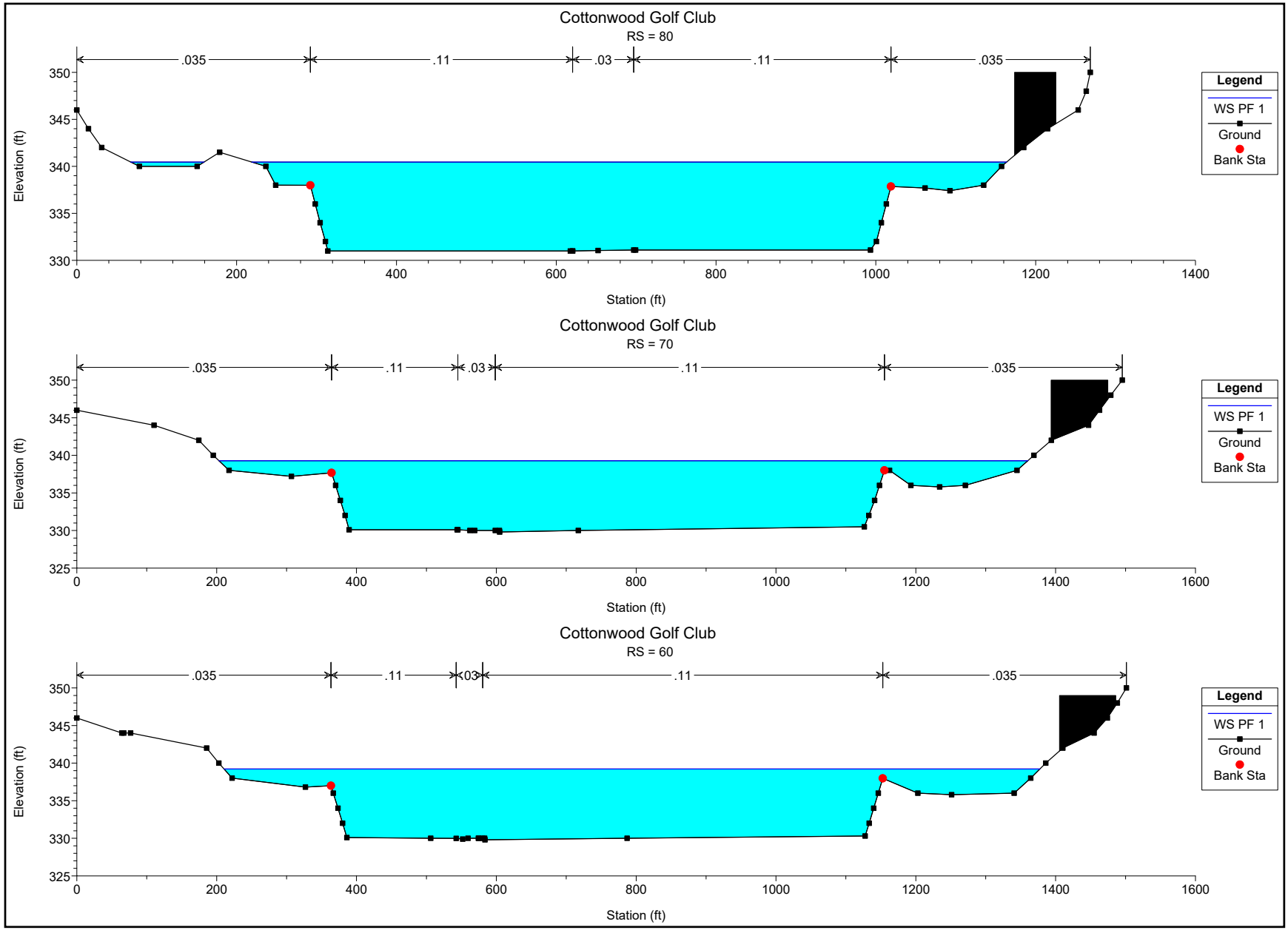

Cottonwood Golf Club
RS = 220
.035
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 210
.035
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 200
.035
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

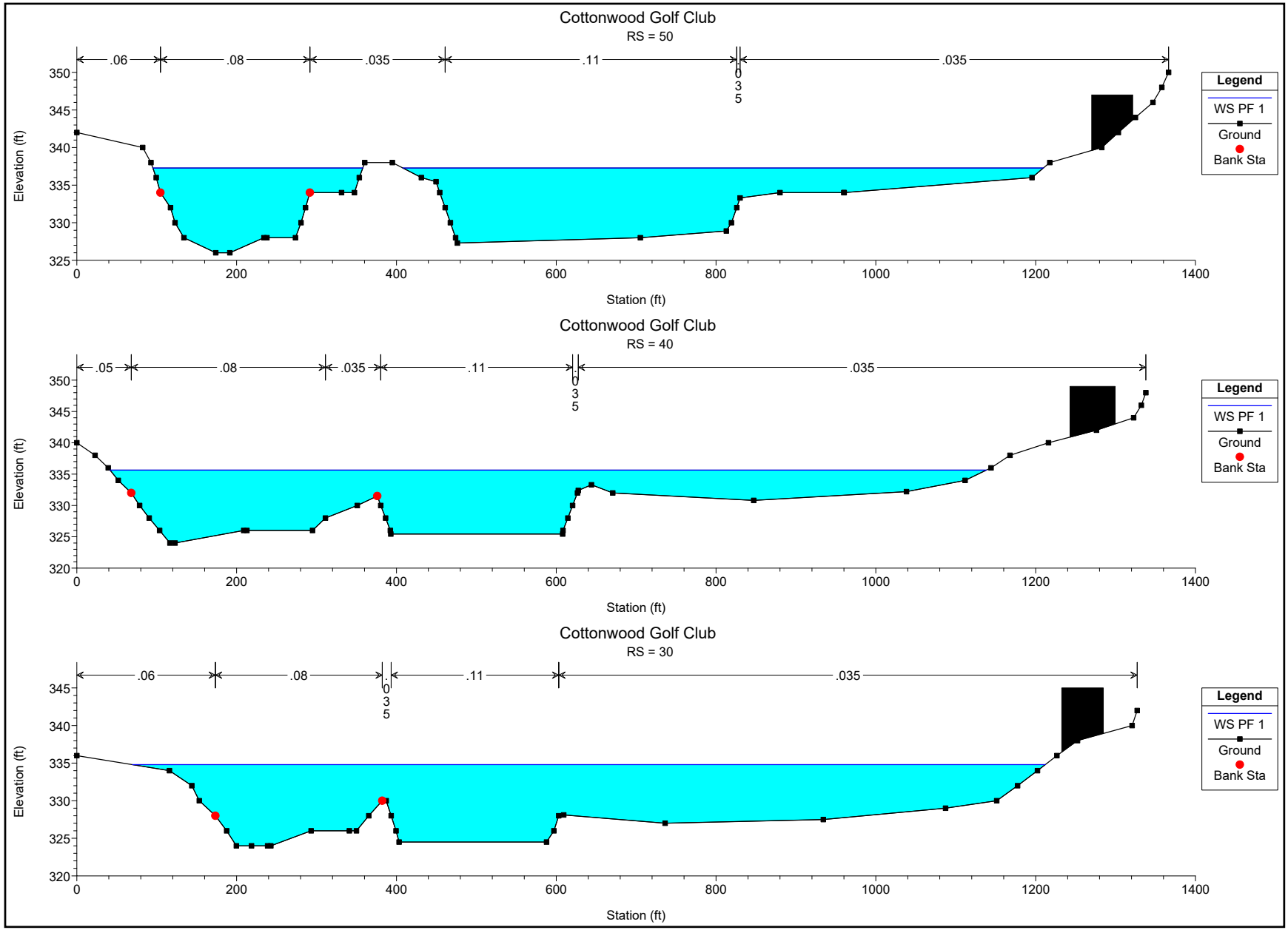

Cottonwood Golf Club
RS = 190
.035
.11
.03
.11
.035
Elevation (ft)
370
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 180
.035
.11
.03
.11
.035
Elevation (ft)
370
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 170
.08
.11
.04
.11
.035
Elevation (ft)
370
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

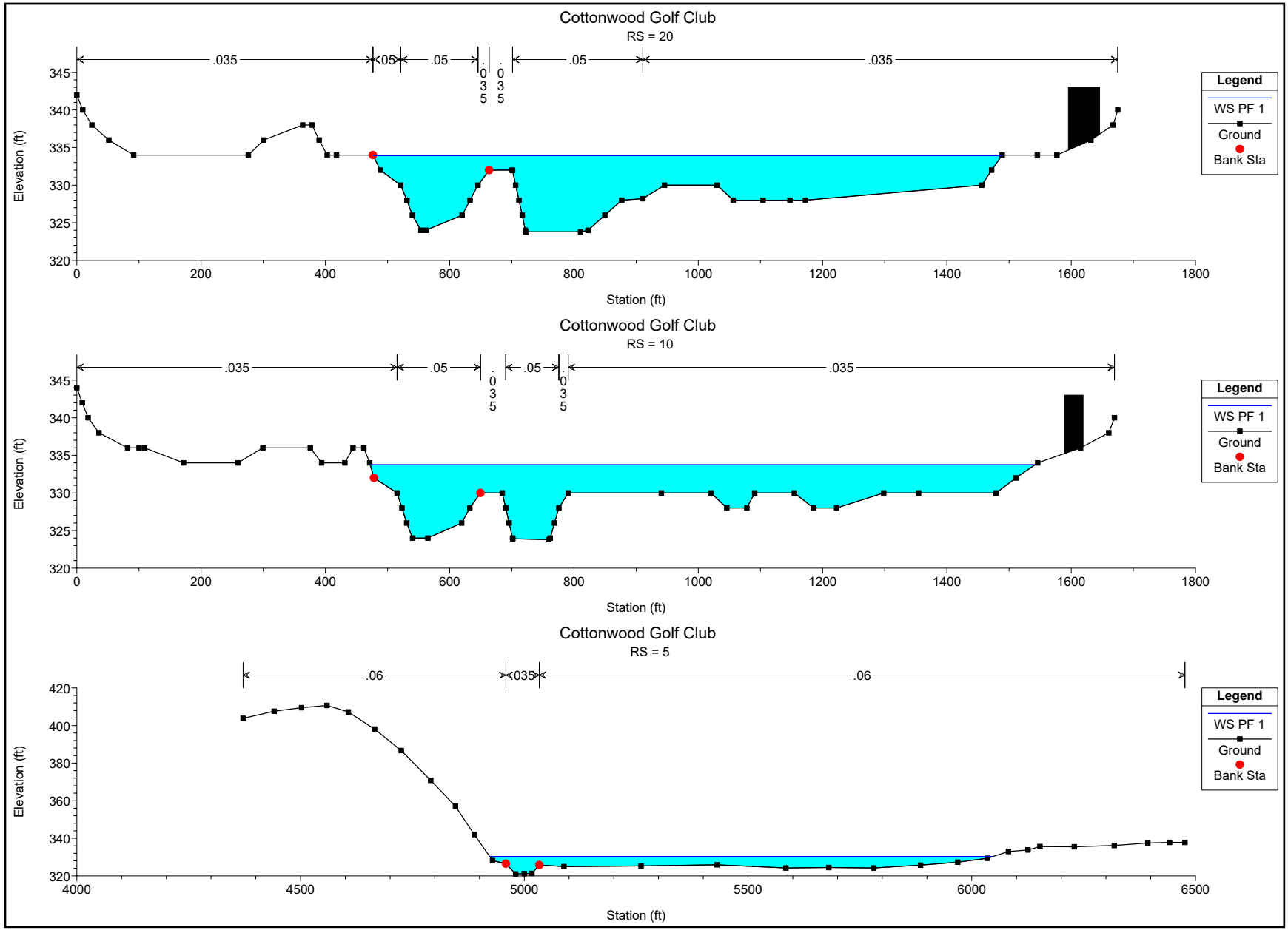

Cottonwood Golf Club
RS = 160
.08
.11
.04
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 150
.08
.035
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 140
.06
.025
.06
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 130
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 125 MO
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 120
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta


Cottonwood Golf Club
RS = 110
.035
.025
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 100
.035
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 90
.035
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 80
.035
.11
.03
.11
.035
Elevation (ft)
350
345
340
335
330
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 70
.035
.11
.03
.11
.035
Elevation (ft)
350
345
340
335
330
325
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 60
.035
.11
.03
.11
.035
Elevation (ft)
350
345
340
335
330
325
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 50
.06
.08
.035
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 40
.05
.08
.035
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 30
.06
.08
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 20
.035
.05
.05
.035
.05
.035
.035
Elevation (ft)
345
340
335
330
325
320
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 10
.035
.05
.05
.035
.035
.035
Elevation (ft)
345
340
335
330
325
320
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 5
.06
035
.06
Elevation (ft)
420
400
380
360
340
320
4000
4500
5000
5500
6000
6500
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

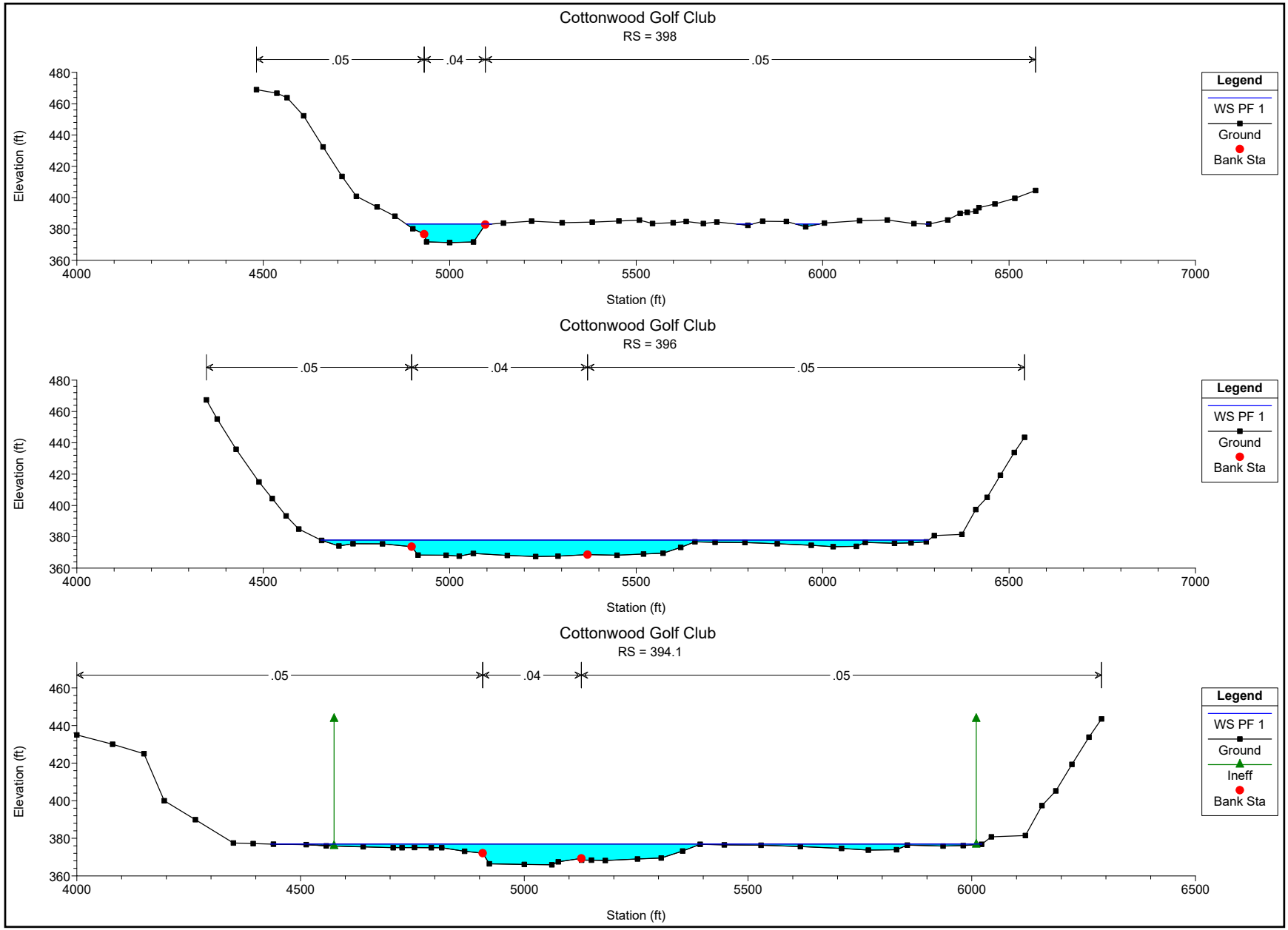
Reclamation Phase 4

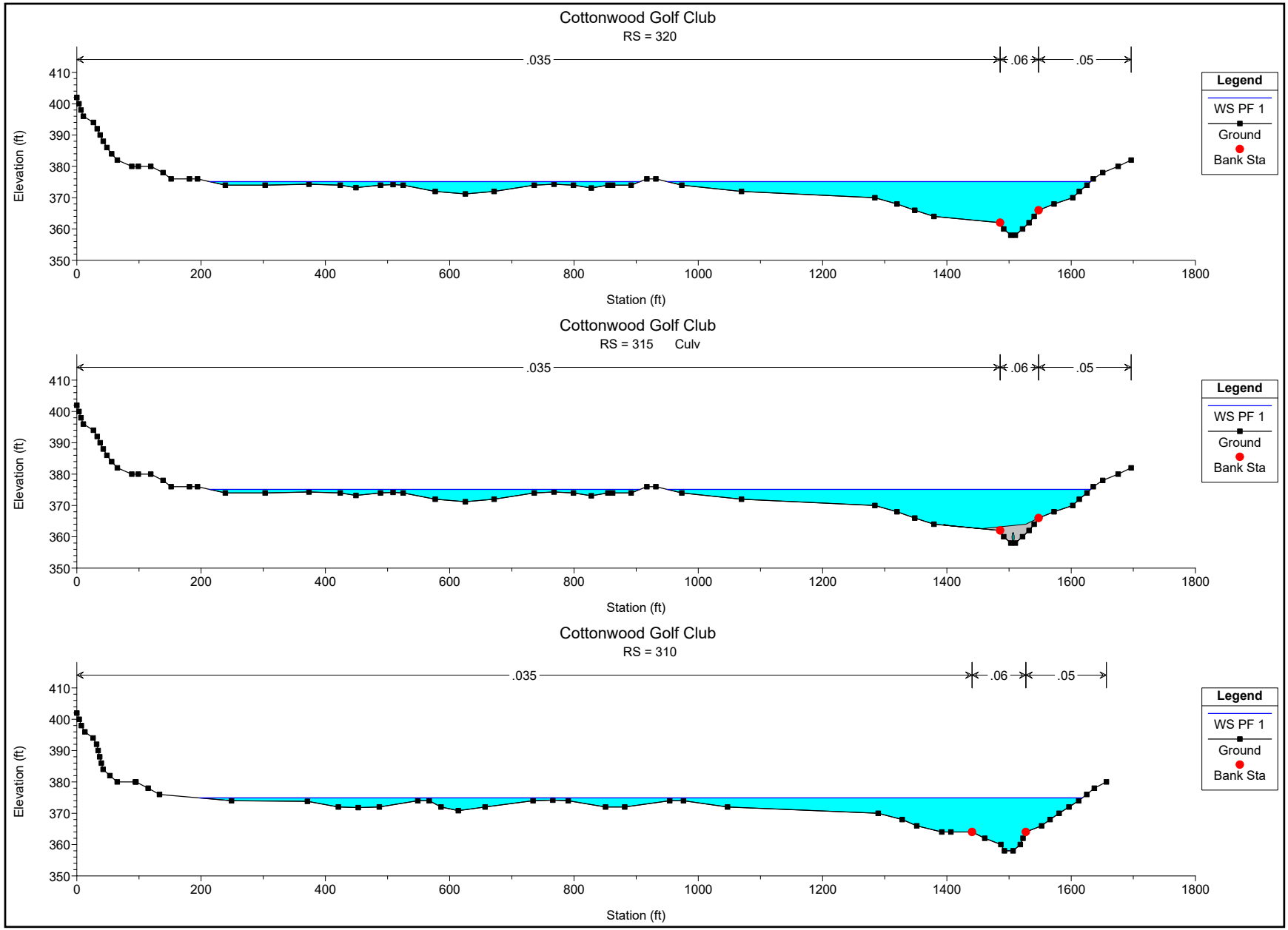
HEC-RAS Plan: PC Phase 4 River: RIVER-1 Reach: Reach-1 Profile: PF 1

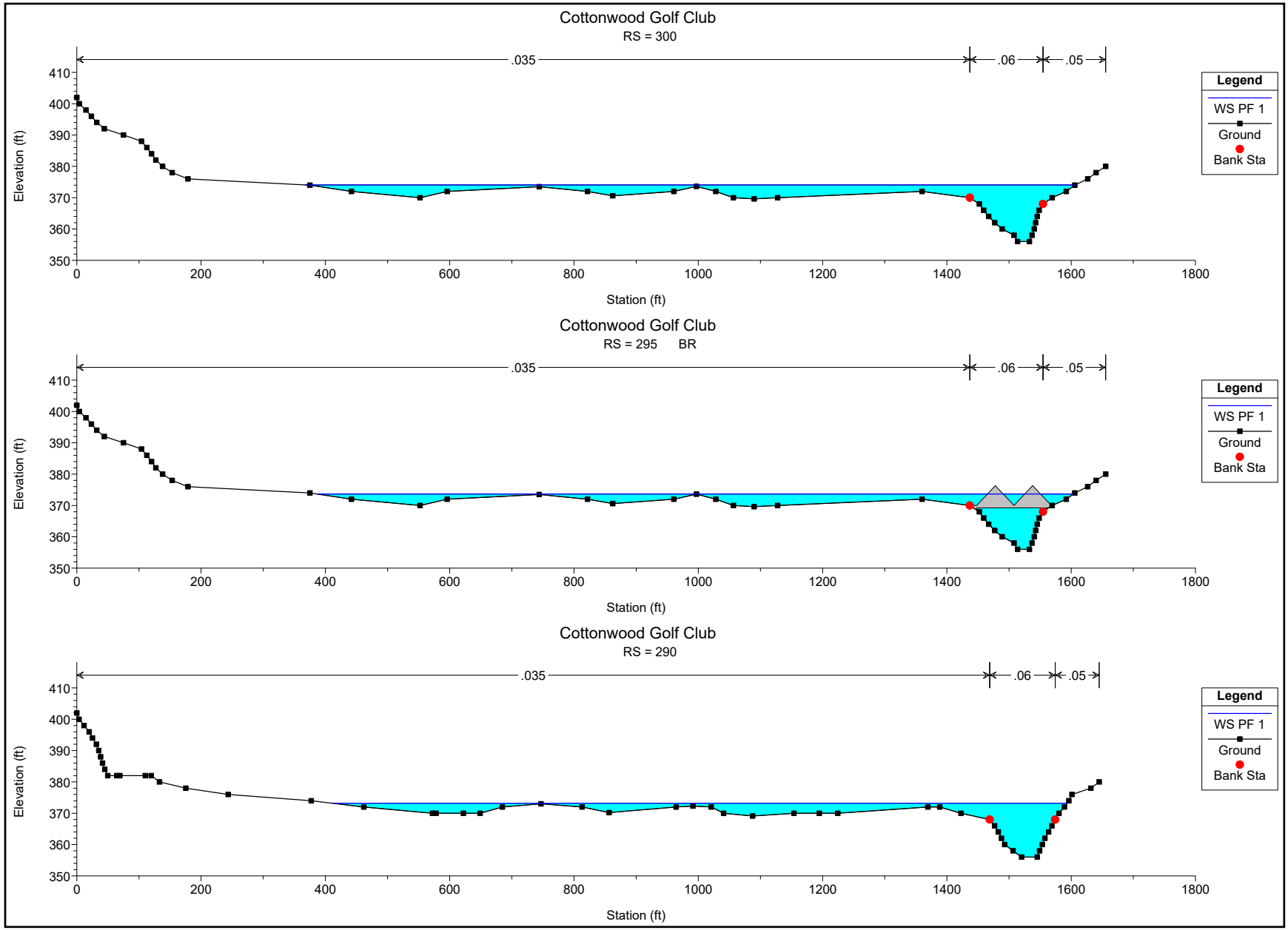
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	398	PF 1	29500.00	371.30	383.17	383.17	387.25	0.008936	16.52	1955.33	346.72	0.90
Reach-1	396	PF 1	29500.00	367.40	377.93		378.17	0.000727	4.55	8978.87	1629.54	0.26
Reach-1	394.1	PF 1	29500.00	365.90	376.94		377.77	0.002571	8.73	5596.40	1589.67	0.49
Reach-1	320	PF 1	29500.00	358.00	375.12	372.02	375.57	0.001912	6.34	5630.40	1373.51	0.29
Reach-1	315		Culvert									
Reach-1	310	PF 1	29500.00	358.00	374.88		375.38	0.002675	7.42	5581.72	1420.00	0.35
Reach-1	300	PF 1	29500.00	356.00	374.07	373.56	374.98	0.005361	9.41	4263.89	1238.66	0.47
Reach-1	295		Bridge									
Reach-1	290	PF 1	29500.00	356.00	373.18	373.18	374.44	0.006936	11.12	3758.37	1181.64	0.54
Reach-1	280	PF 1	29500.00	352.90	363.63		363.86	0.003566	3.83	7696.40	749.07	0.21
Reach-1	270	PF 1	29500.00	350.00	362.54		362.72	0.002483	3.41	8694.27	922.67	0.18
Reach-1	260	PF 1	29500.00	348.00	361.46		361.63	0.001992	3.28	8986.93	730.28	0.16
Reach-1	250	PF 1	29500.00	347.00	360.26		360.45	0.002155	3.48	8486.68	683.61	0.17
Reach-1	240	PF 1	29500.00	346.00	360.24		360.41	0.001961	3.39	8702.74	677.93	0.17
Reach-1	230	PF 1	29500.00	346.00	359.39		359.62	0.002619	3.87	7613.56	617.78	0.19
Reach-1	220	PF 1	29500.00	346.00	359.35		359.58	0.002633	3.88	7596.85	615.84	0.19
Reach-1	210	PF 1	29500.00	345.00	357.79		358.07	0.003344	4.21	7006.03	592.63	0.22
Reach-1	200	PF 1	29500.00	344.90	357.72		358.00	0.003368	4.23	6967.36	588.05	0.22
Reach-1	190	PF 1	29500.00	344.00	355.74		356.14	0.005365	5.07	5813.55	534.51	0.27
Reach-1	180	PF 1	29500.00	343.00	354.46		354.68	0.002494	3.76	7862.60	771.20	0.20
Reach-1	170	PF 1	29500.00	342.10	352.37		352.83	0.009103	5.54	5444.81	687.26	0.33
Reach-1	160	PF 1	29500.00	341.10	352.24	347.24	352.69	0.008780	5.48	5520.05	728.68	0.32
Reach-1	150	PF 1	29500.00	340.40	349.71		349.98	0.003976	4.35	7168.46	1040.53	0.26
Reach-1	140	PF 1	29500.00	338.00	349.44		349.66	0.000342	1.20	11688.17	1320.27	0.07
Reach-1	130	PF 1	29500.00	337.30	348.47	345.10	349.33	0.001370	7.64	4041.50	1122.41	0.46
Reach-1	125		Mult Open									
Reach-1	120	PF 1	29500.00	338.10	346.46	346.46	348.93	0.007768	12.80	2359.51	982.82	1.01
Reach-1	110	PF 1	29500.00	334.00	342.62		342.87	0.001362	4.00	7368.00	1017.51	0.26
Reach-1	100	PF 1	29500.00	332.20	341.90		342.17	0.002037	3.68	7417.15	917.67	0.21
Reach-1	90	PF 1	29500.00	331.00	340.53		340.79	0.002873	4.11	7209.08	1000.04	0.24
Reach-1	80	PF 1	29500.00	331.00	340.45		340.72	0.002908	4.12	7205.16	1036.12	0.24
Reach-1	70	PF 1	29500.00	329.80	339.28		339.50	0.002975	3.76	7799.26	1156.97	0.22
Reach-1	60	PF 1	29500.00	329.80	339.21		339.43	0.003037	3.63	7955.90	1166.75	0.21
Reach-1	50	PF 1	29500.00	326.00	337.28		337.62	0.004460	5.39	6378.49	1064.31	0.31
Reach-1	40	PF 1	29500.00	324.00	335.63		335.91	0.002460	4.55	7081.80	1096.53	0.27
Reach-1	30	PF 1	29500.00	324.00	334.80		335.01	0.001108	2.70	8251.28	1142.26	0.16
Reach-1	20	PF 1	29500.00	324.00	333.91		334.32	0.001881	4.77	5746.74	1011.29	0.34
Reach-1	10	PF 1	29500.00	324.00	333.75		334.26	0.002611	5.83	5166.49	1069.62	0.40

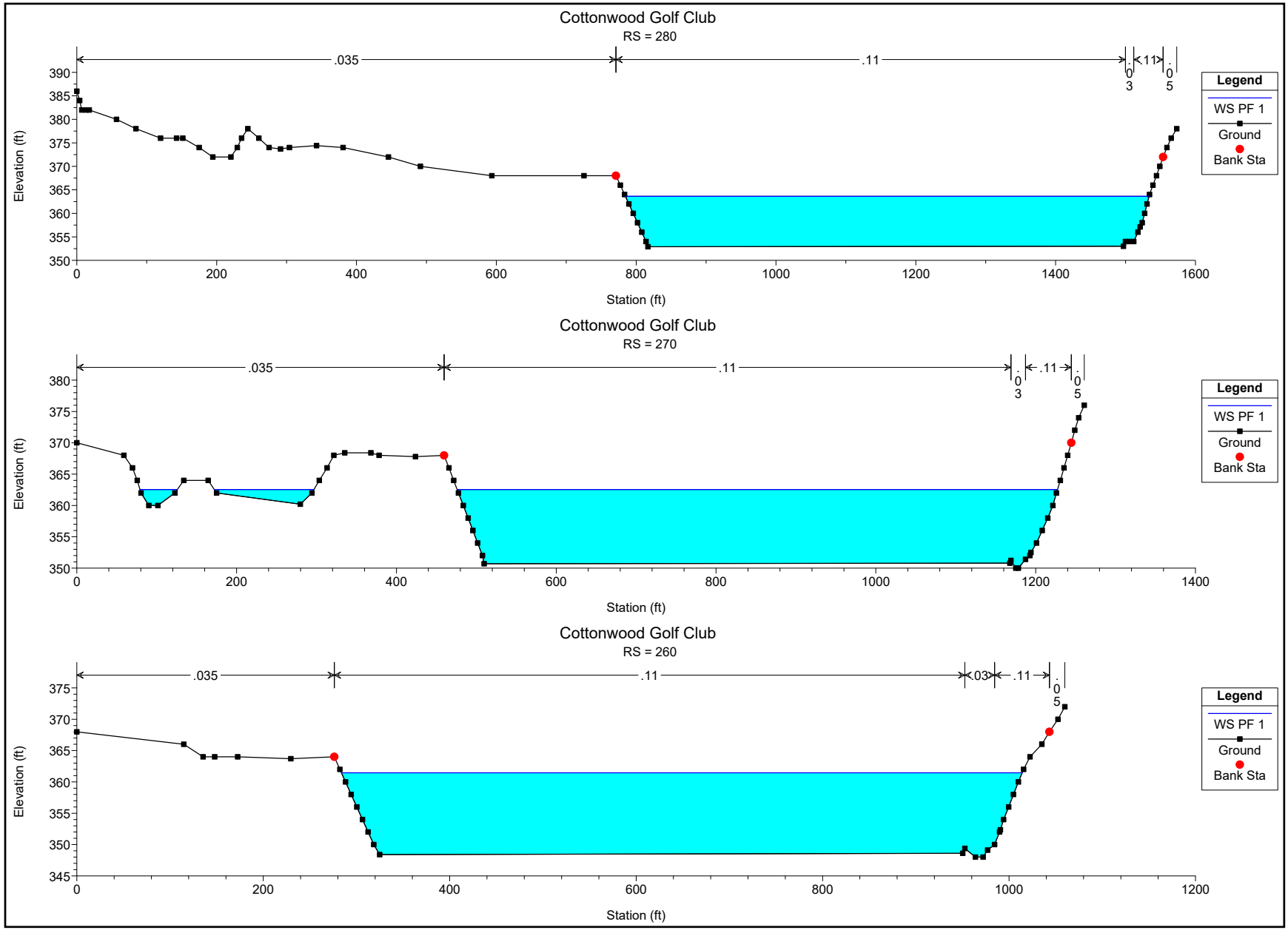
HEC-RAS Plan: PC Phase 4 River: RIVER-1 Reach: Reach-1 Profile: PF 1 (Continued)

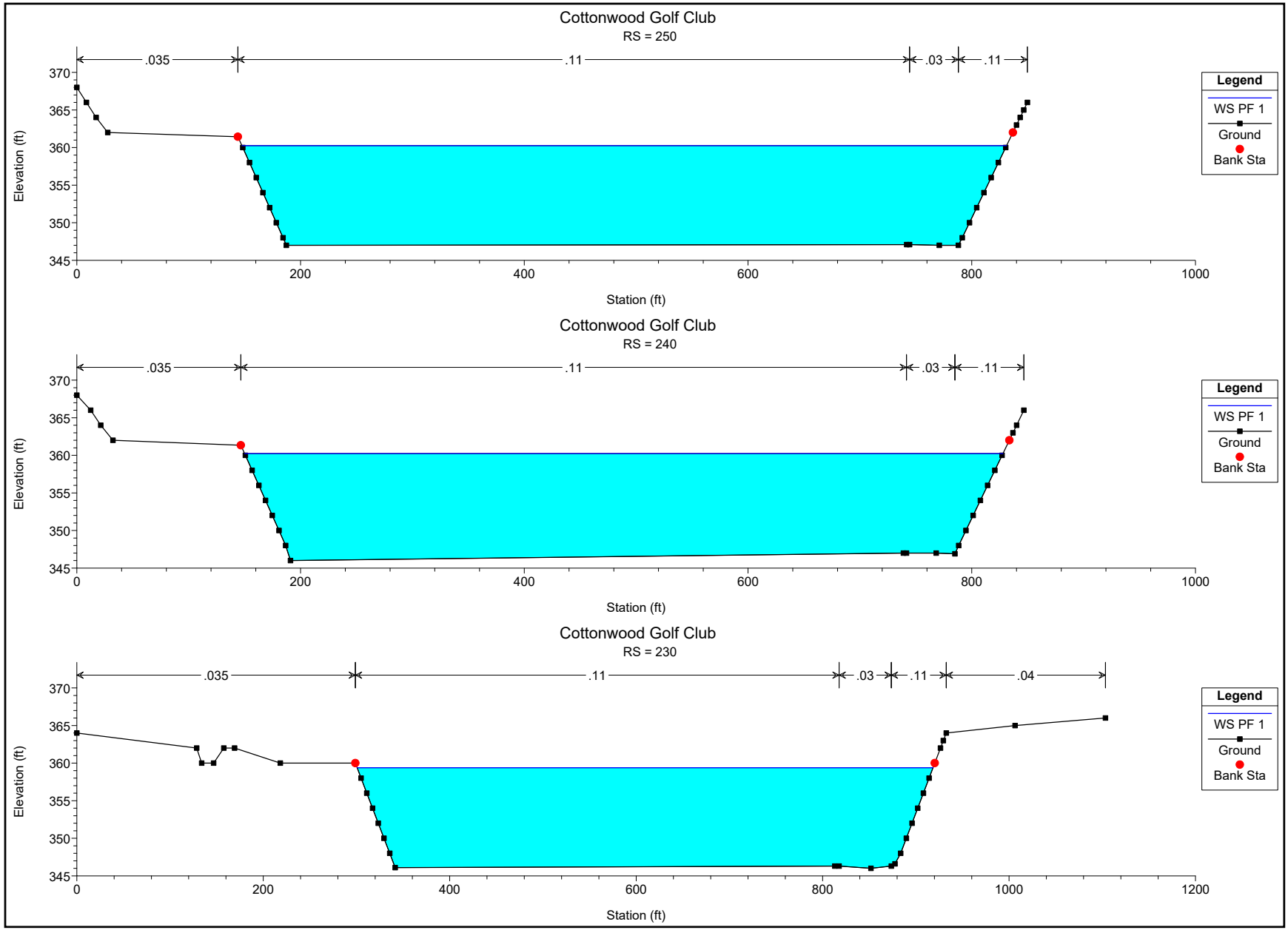
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	5	PF 1	29500.00	321.10	330.28	328.76	330.93	0.004294	10.82	5598.21	1123.72	0.68

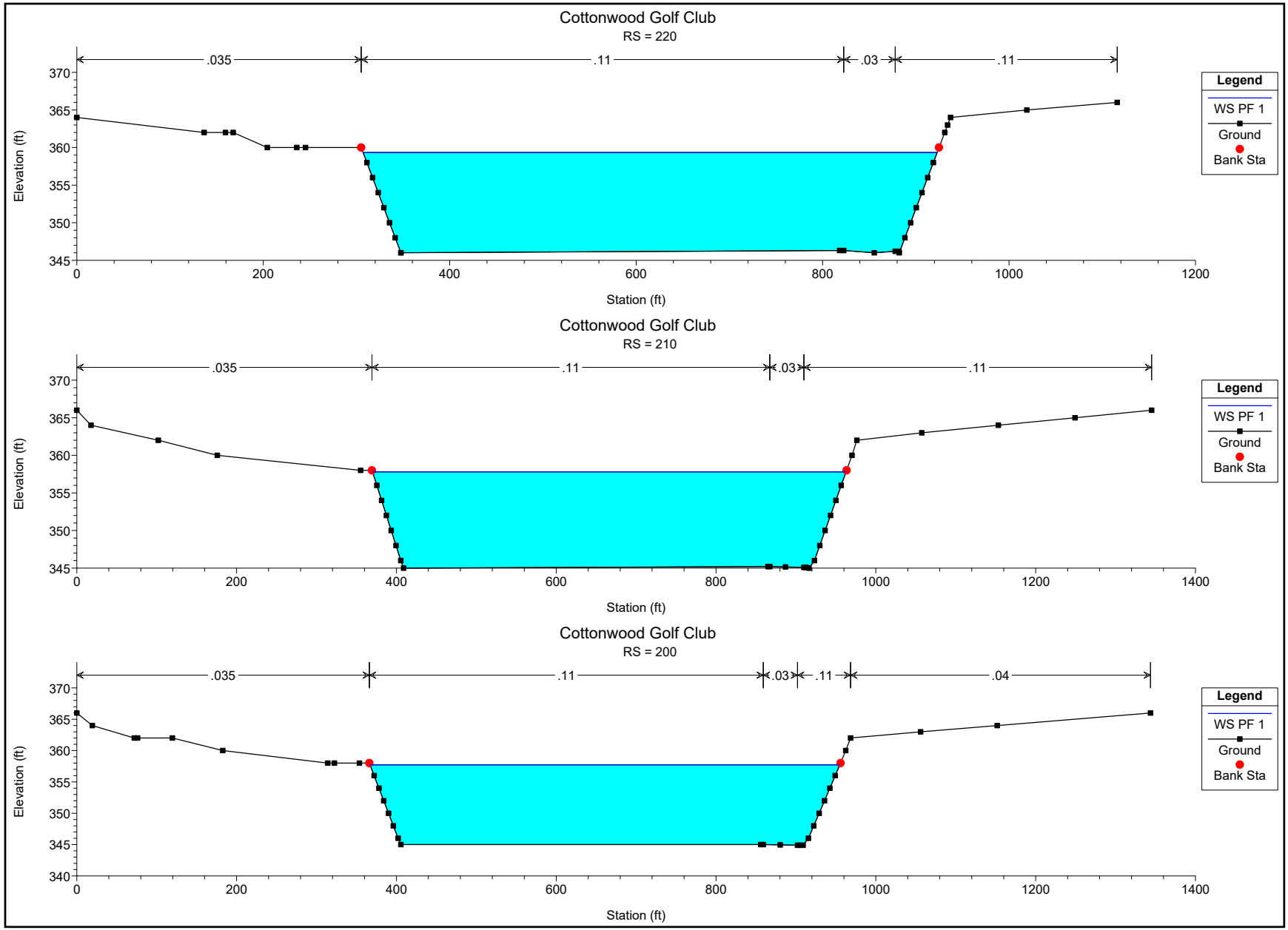

Cottonwood Golf Club
RS = 398
.05
.04
.05
Elevation (ft)
480
460
440
420
400
380
360
4000
4500
5000
5500
6000
6500
7000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 396
.05
.04
.05
Elevation (ft)
480
460
440
420
400
380
360
4000
4500
5000
5500
6000
6500
7000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 394.1
.05
.04
.05
Elevation (ft)
460
440
420
400
380
360
4000
4500
5000
5500
6000
6500
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta

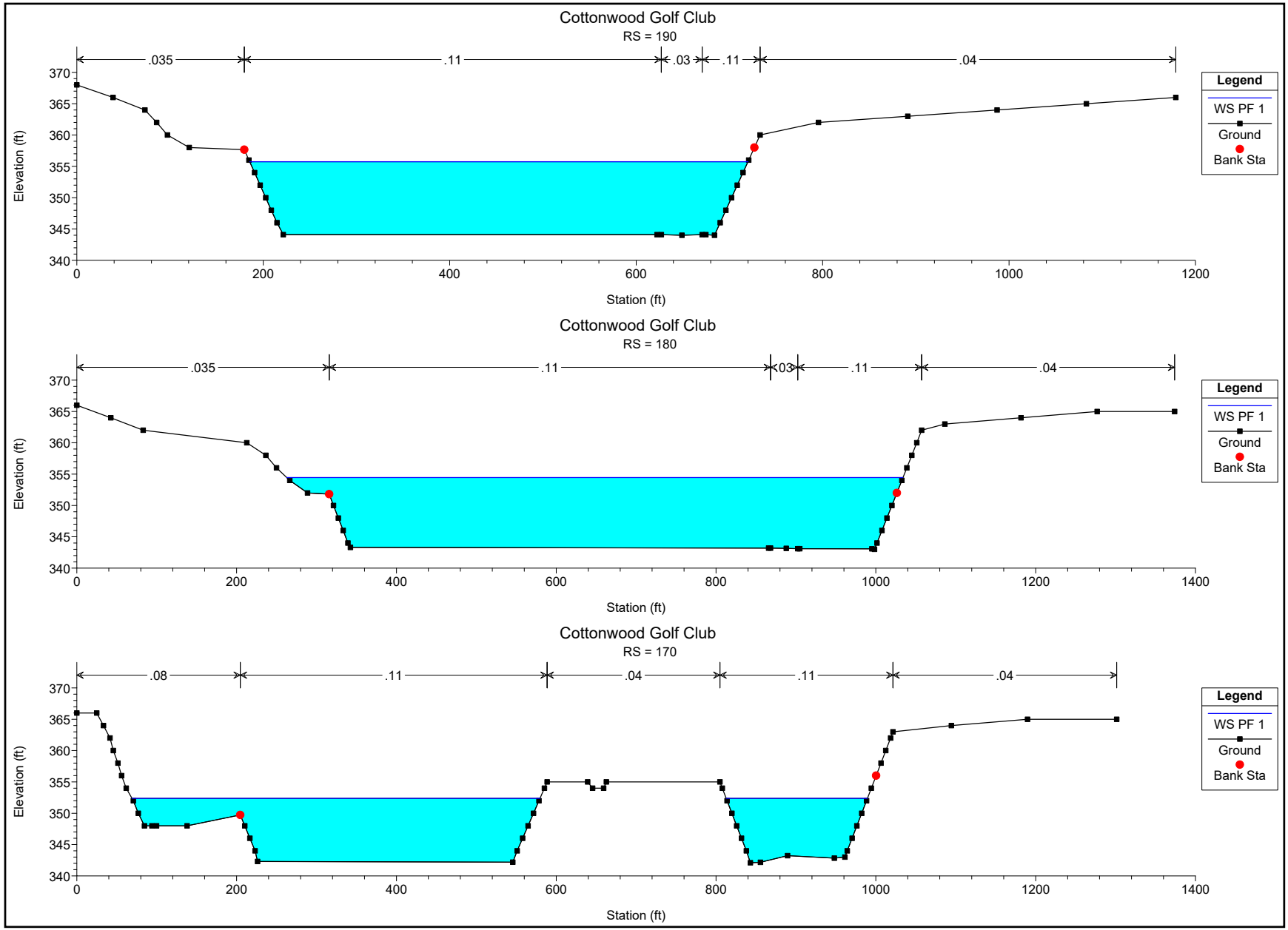

Cottonwood Golf Club
RS = 320
.035
.06
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 315 Culv
.035
.06
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 310
.035
.06
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

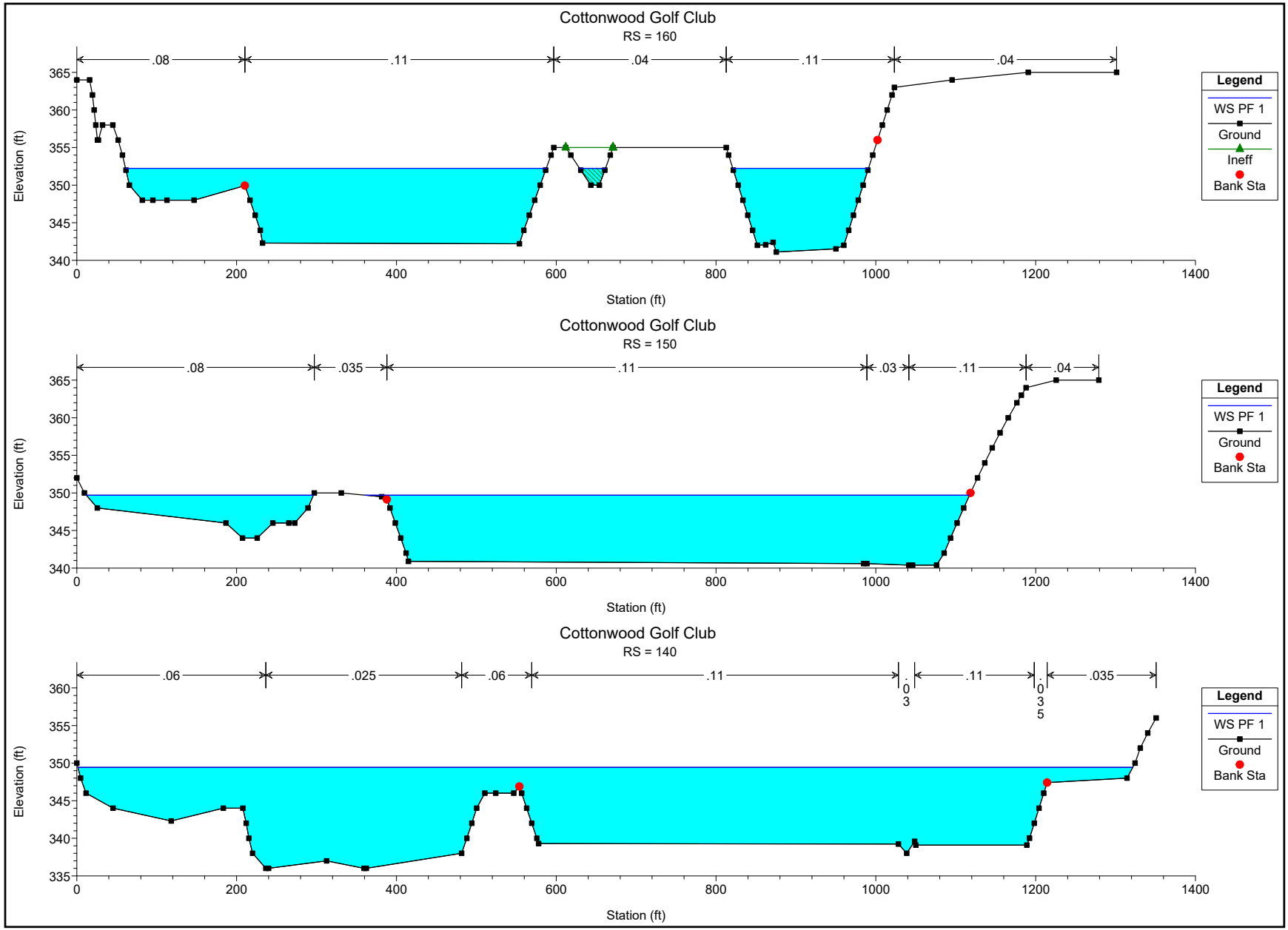

Cottonwood Golf Club
RS = 300
.035
.06
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 295 BR
.035
.06
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 290
.035
.06
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

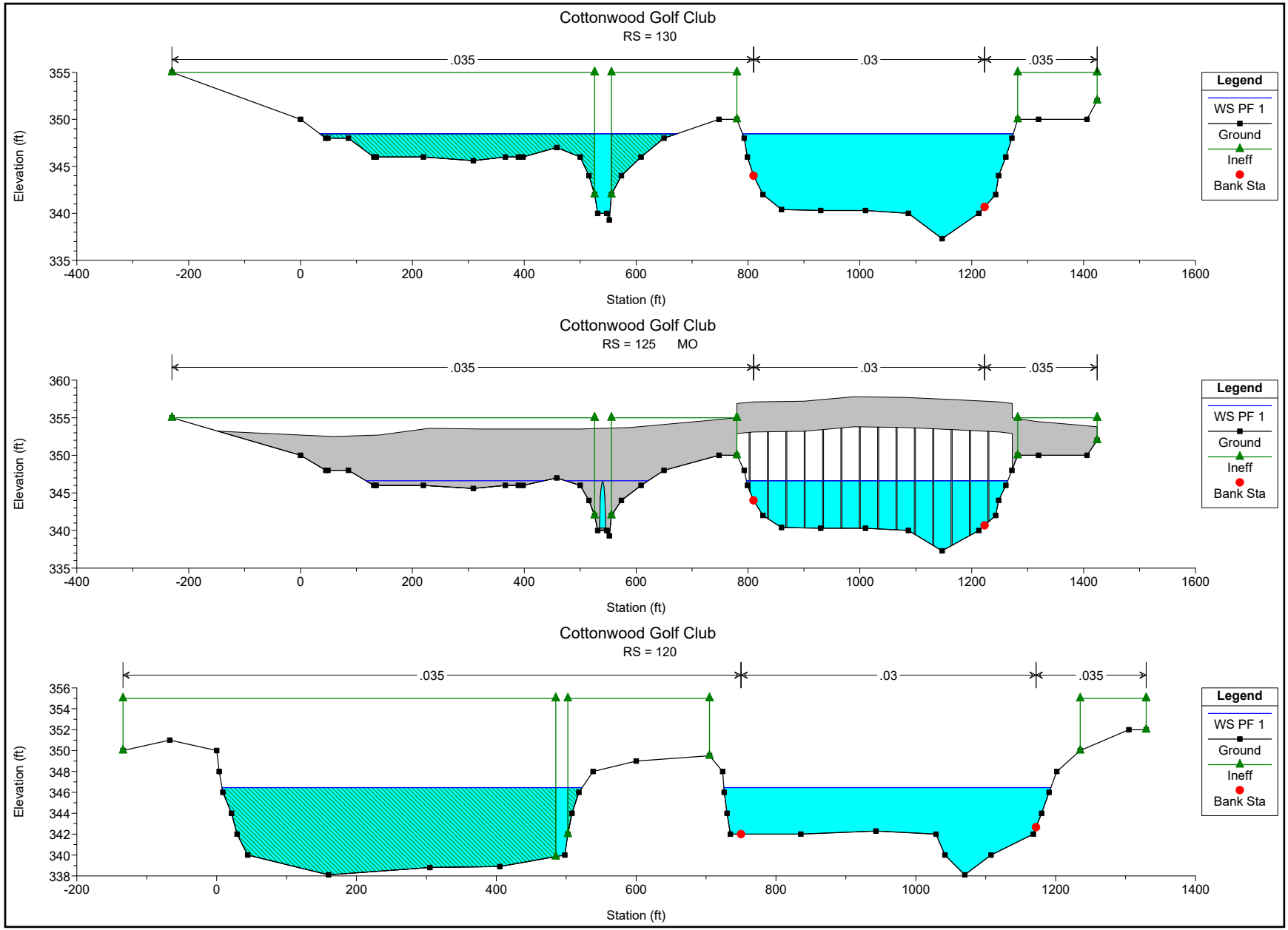

Cottonwood Golf Club
RS = 280
.035
.11
.03
.11
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 270
.035
.11
.03
.11
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 260
.035
.11
.03
.11
.05
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

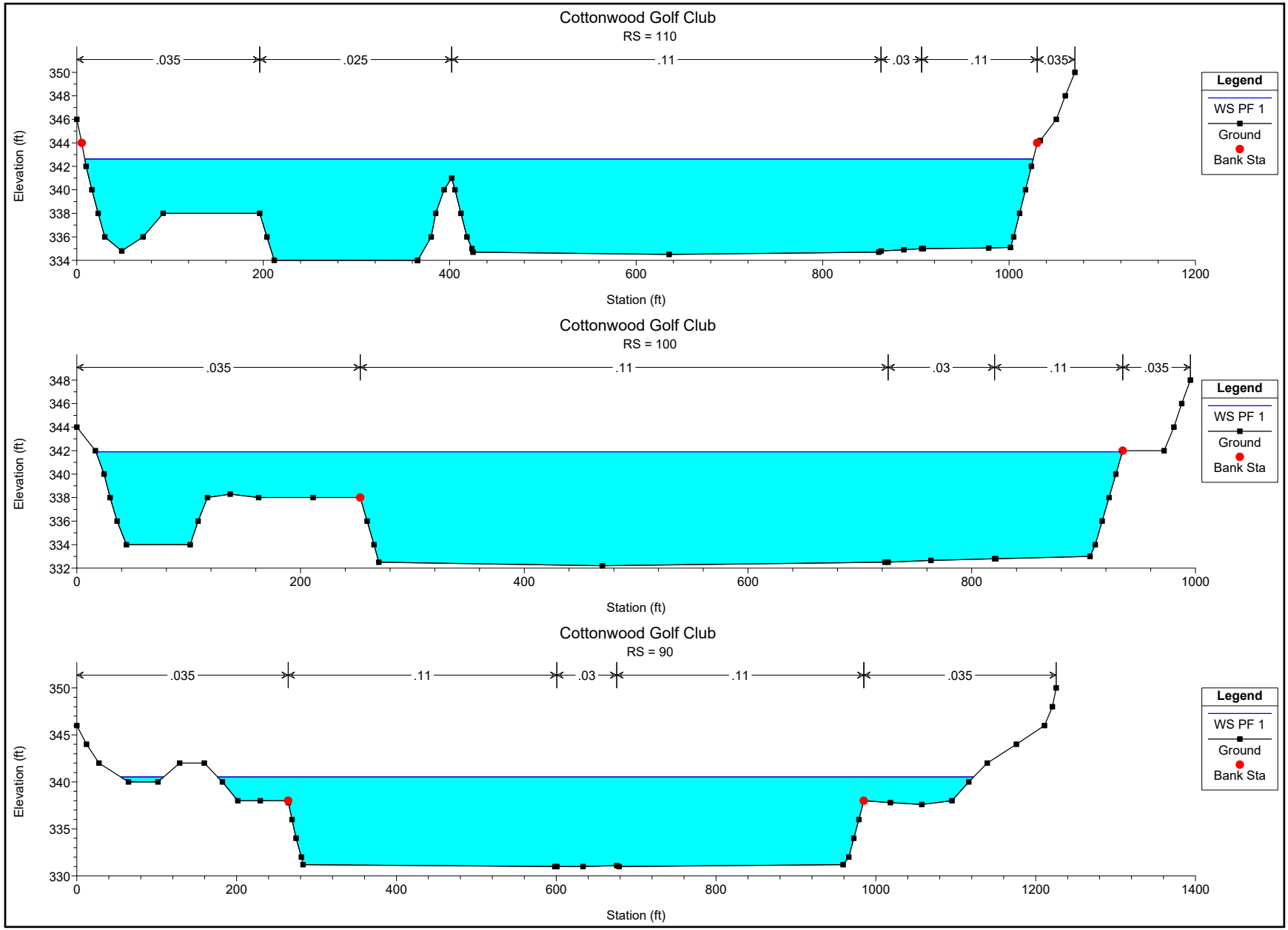

Cottonwood Golf Club
RS = 250
.035
.11
.03
.11
Elevation (ft)
370
365
360
355
350
345
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 240
.035
.11
.03
.11
Elevation (ft)
370
365
360
355
350
345
0
200
400
600
800
1000
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 230
.035
.11
.03
.11
.04
Elevation (ft)
370
365
360
355
350
345
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

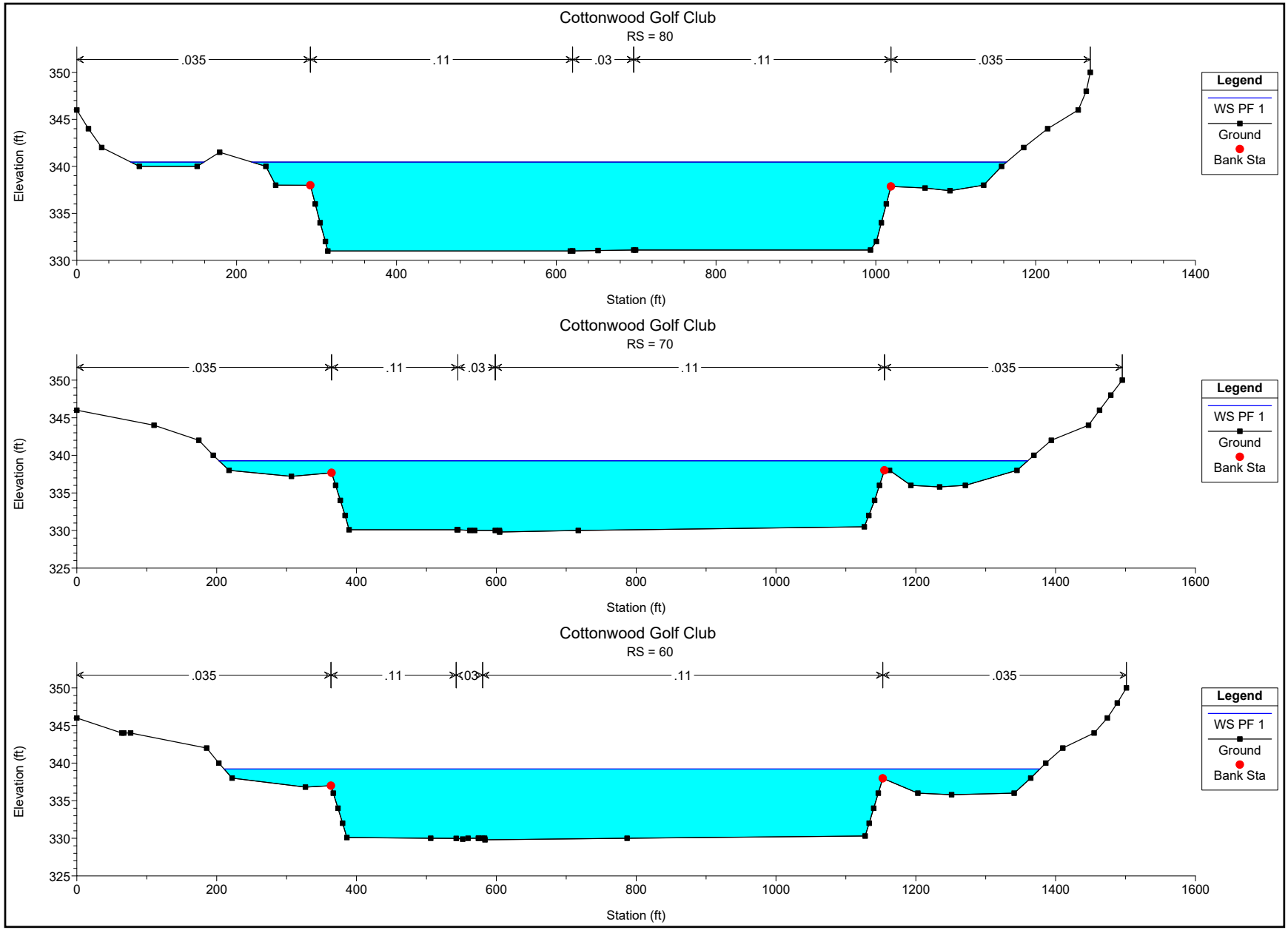

Cottonwood Golf Club
RS = 220
.035
.11
.03
.11
Elevation (ft)
370
365
360
355
350
345
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 210
.035
.11
.03
.11
Elevation (ft)
370
365
360
355
350
345
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 200
.035
.11
.03
.11
.04
Elevation (ft)
370
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

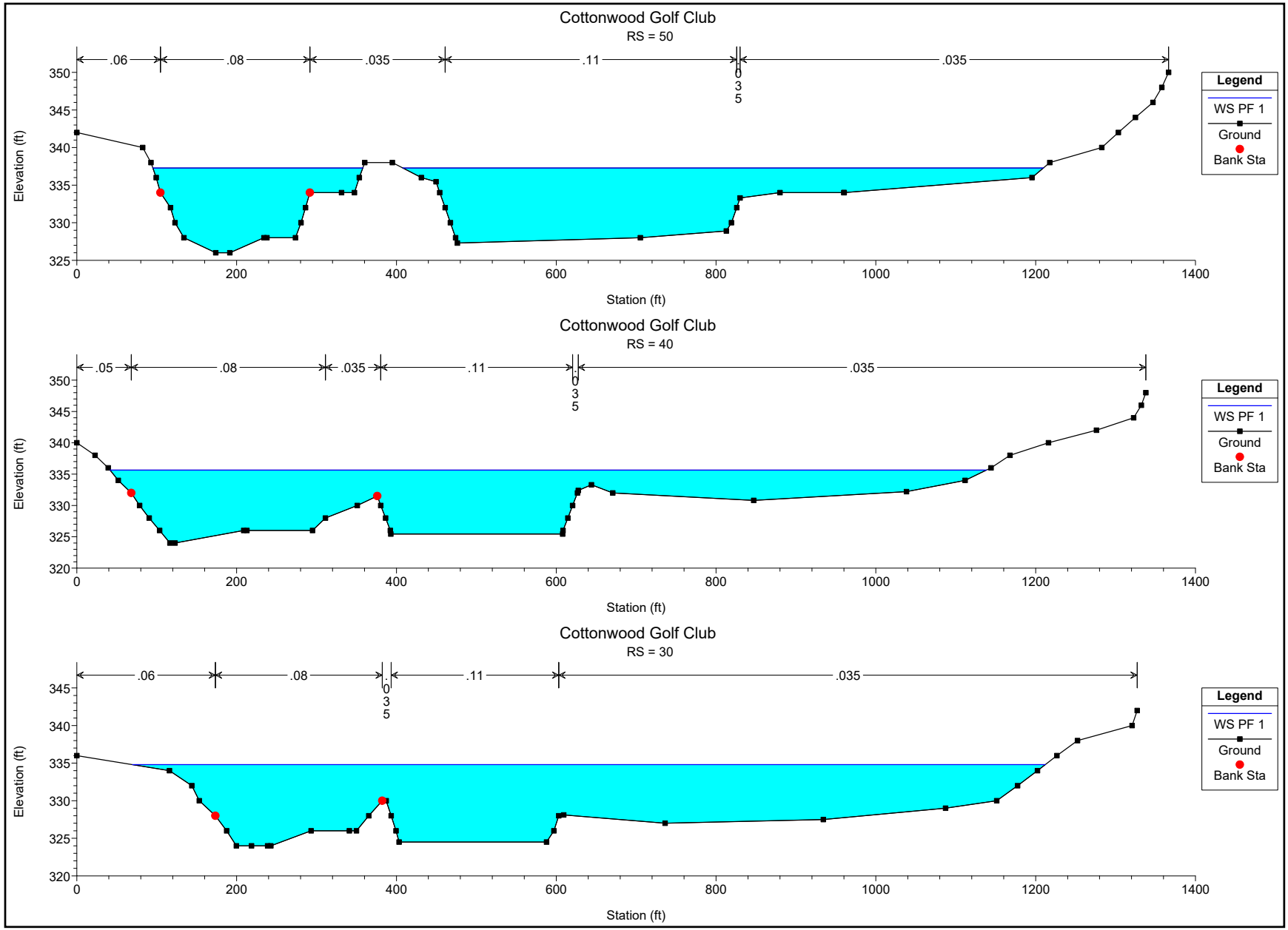

Cottonwood Golf Club
RS = 190
.035
.11
.03
.11
.04
Elevation (ft)
370
365
360
355
350
345
340
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 180
.035
.11
.03
.11
.04
Elevation (ft)
370
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 170
.08
.11
.04
.11
.04
Elevation (ft)
370
365
360
355
350
345
340
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

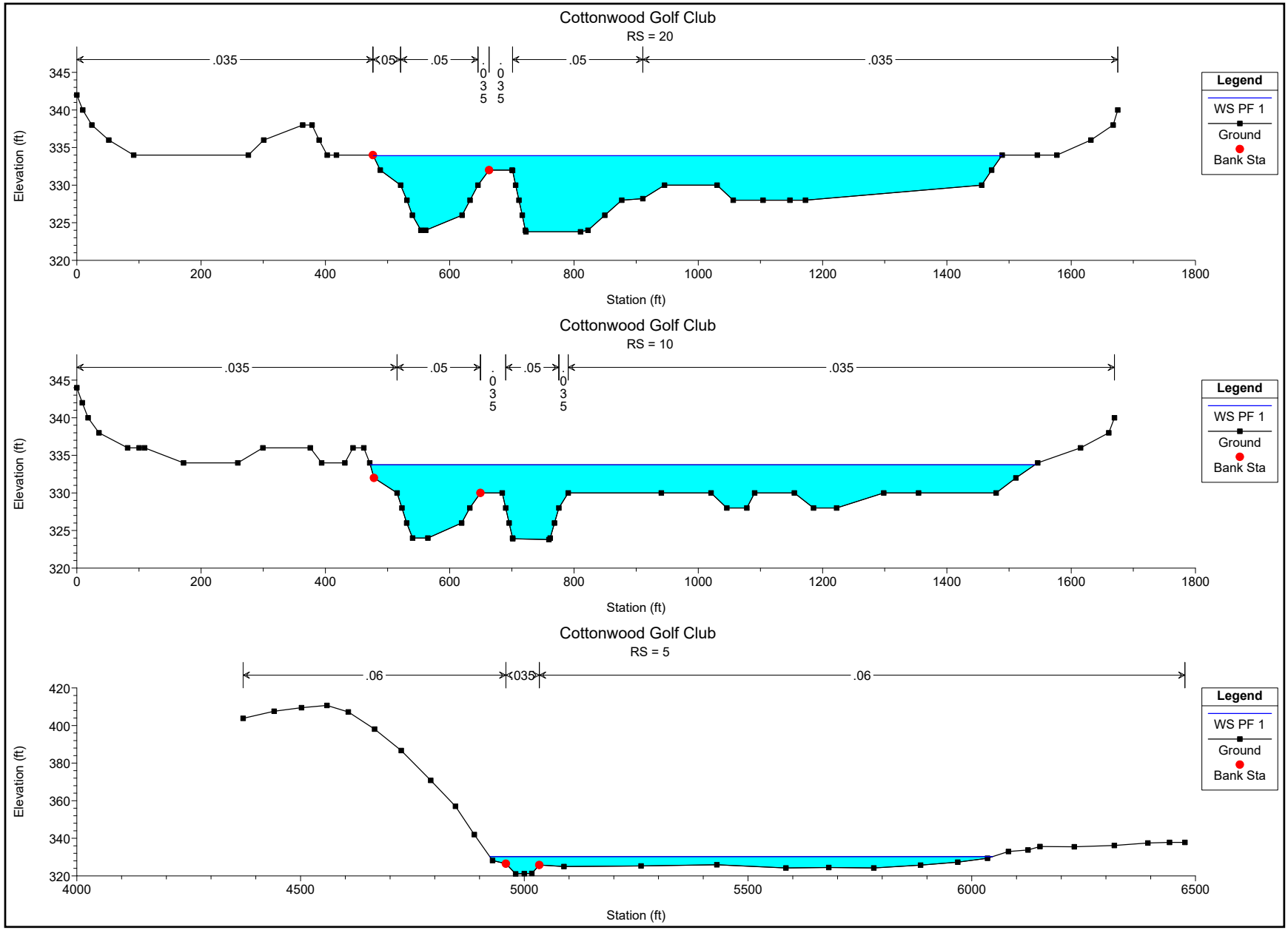

Cottonwood Golf Club
RS = 160
.08
.11
.04
.11
.04
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 150
.08
.035
.11
.03
.11
.04
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 140
.06
.025
.06
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 130
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 125 MO
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta
Cottonwood Golf Club
RS = 120
.035
.03
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Ineff
Bank Sta


Cottonwood Golf Club
RS = 110
.035
.025
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 100
.035
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 90
.035
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 80
.035
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 70
.035
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 60
.035
.11
.03
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 50
.06
.08
.035
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 40
.05
.08
.035
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 30
.06
.08
.11
.035
Elevation (ft)
Station (ft)
Legend
WS PF 1
Ground
Bank Sta


Cottonwood Golf Club
RS = 20
.035
.05
.05
.035
.05
.035
.035
Elevation (ft)
345
340
335
330
325
320
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 10
.035
.05
.05
.035
.035
.035
Elevation (ft)
345
340
335
330
325
320
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)
Legend
WS PF 1
Ground
Bank Sta
Cottonwood Golf Club
RS = 5
.06
035
.06
Elevation (ft)
420
400
380
360
340
320
4000
4500
5000
5500
6000
6500
Station (ft)
Legend
WS PF 1
Ground
Bank Sta

APPENDIX B

WATER TRANSFER DATA

USGS Sweetwater River Stream Gage Records
2010

Discharge, cubic feet per second

TIME	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5	Feb 6	Feb 7	Feb 8	Feb 9	Feb 10	Feb 11	Feb 12	Feb 13	Feb 14	Feb 15	Feb 16	Feb 17	Feb 18
00:00 PST	0.00[A]	49.1[A]	171[A]	333[A]	294[A]	296[A]	272[A]	259[A]	268[A]	72.3[A]	89.8[A]	67.6[A]	73.3[A]	133[A]	63.1[A]	164[A]	268[A]	255[A]	290[A]	14.7[A]	7.86[A]	2.76[A]
00:15 PST	0.00[A]	55.4[A]	176[A]	280[A]	290[A]	255[A]	270[A]	270[A]	278[A]	75.3[A]	79.3[A]	74.3[A]	72.3[A]	119[A]	72.3[A]	167[A]	263[A]	255[A]	268[A]	11.7[A]	6.34[A]	2.76[A]
00:30 PST	0.00[A]	52.2[A]	167[A]	312[A]	318[A]	294[A]	304[A]	265[A]	308[A]	68.5[A]	89.8[A]	73.3[A]	71.4[A]	140[A]	82.3[A]	144[A]	261[A]	270[A]	241[A]	11.7[A]	5.79[A]	2.35[A]
00:45 PST	0.00[A]	62.2[A]	159[A]	290[A]	259[A]	304[A]	312[A]	286[A]	278[A]	77.2[A]	82.3[A]	76.2[A]	75.3[A]	125[A]	69.5[A]	161[A]	280[A]	250[A]	250[A]	12.0[A]	5.53[A]	2.99[A]
01:00 PST	0.00[A]	63.1[A]	164[A]	280[A]	327[A]	282[A]	296[A]	246[A]	292[A]	72.3[A]	81.3[A]	61.3[A]	68.5[A]	121[A]	67.6[A]	128[A]	270[A]	298[A]	278[A]	11.7[A]	5.04[A]	2.55[A]
01:15 PST	0.00[A]	57.1[A]	170[A]	314[A]	288[A]	286[A]	276[A]	267[A]	268[A]	68.5[A]	62.2[A]	69.5[A]	71.4[A]	128[A]	75.3[A]	158[A]	246[A]	250[A]	274[A]	11.7[A]	6.06[A]	2.76[A]
01:30 PST	0.00[A]	44.6[A]	170[A]	323[A]	263[A]	280[A]	270[A]	288[A]	296[A]	67.6[A]	77.2[A]	73.3[A]	69.5[A]	137[A]	69.5[A]	133[A]	252[A]	267[A]	288[A]	11.3[A]	5.28[A]	2.35[A]
01:45 PST	0.00[A]	48.3[A]	168[A]	265[A]	278[A]	320[A]	288[A]	267[A]	298[A]	79.3[A]	82.3[A]	69.5[A]	73.3[A]	123[A]	70.4[A]	151[A]	253[A]	286[A]	253[A]	11.3[A]	5.28[A]	2.35[A]
02:00 PST	0.00[A]	46.1[A]	164[A]	288[A]	296[A]	331[A]	223[A]	255[A]	280[A]	75.3[A]	90.9[A]	65.8[A]	66.7[A]	120[A]	64.0[A]	159[A]	274[A]	235[A]	263[A]	12.8[A]	11.0[A]	2.76[A]
02:15 PST	0.00[A]	47.5[A]	168[A]	255[A]	302[A]	346[A]	333[A]	278[A]	261[A]	81.3[A]	84.4[A]	67.6[A]	70.4[A]	115[A]	70.4[A]	140[A]	280[A]	302[A]	246[A]	11.7[A]	7.22[A]	2.55[A]
02:30 PST	0.00[A]	53.0[A]	165[A]	300[A]	255[A]	292[A]	312[A]	312[A]	255[A]	66.7[A]	86.6[A]	66.7[A]	70.4[A]	116[A]	73.3[A]	142[A]	261[A]	278[A]	286[A]	11.3[A]	4.69[A]	2.76[A]
02:45 PST	0.00[A]	47.5[A]	173[A]	257[A]	272[A]	306[A]	314[A]	257[A]	278[A]	70.4[A]	95.4[A]	73.3[A]	68.5[A]	125[A]	71.4[A]	137[A]	276[A]	278[A]	243[A]	11.7[A]	5.28[A]	2.76[A]
03:00 PST	0.00[A]	57.1[A]	179[A]	353[A]	329[A]	265[A]	298[A]	265[A]	304[A]	72.3[A]	79.3[A]	73.3[A]	68.5[A]	119[A]	79.3[A]	158[A]	222[A]	284[A]	286[A]	11.7[A]	4.69[A]	2.76[A]
03:15 PST	0.00[A]	57.1[A]	162[A]	252[A]	327[A]	296[A]	302[A]	274[A]	298[A]	78.2[A]	78.2[A]	63.1[A]	65.8[A]	110[A]	66.7[A]	164[A]	263[A]	274[A]	250[A]	11.3[A]	4.69[A]	2.55[A]
03:30 PST	0.00[A]	68.5[A]	181[A]	280[A]	296[A]	282[A]	296[A]	294[A]	268[A]	68.5[A]	85.5[A]	69.5[A]	58.7[A]	102[A]	69.5[A]	142[A]	282[A]	232[A]	267[A]	11.0[A]	4.69[A]	2.16[A]
03:45 PST	0.00[A]	61.3[A]	158[A]	318[A]	286[A]	300[A]	302[A]	267[A]	265[A]	76.2[A]	82.3[A]	71.4[A]	74.3[A]	113[A]	78.2[A]	142[A]	261[A]	265[A]	261[A]	11.0[A]	4.37[A]	2.35[A]
04:00 PST	0.00[A]	62.2[A]	173[A]	259[A]	276[A]	288[A]	306[A]	280[A]	290[A]	64.0[A]	80.3[A]	80.3[A]	73.3[A]	110[A]	82.3[A]	144[A]	284[A]	300[A]	294[A]	11.3[A]	4.37[A]	2.55[A]
04:15 PST	0.00[A]	50.6[A]	149[A]	302[A]	306[A]	272[A]	340[A]	267[A]	263[A]	67.6[A]	80.3[A]	70.4[A]	74.3[A]	105[A]	68.5[A]	158[A]	235[A]	278[A]	265[A]	11.3[A]	4.37[A]	2.16[A]
04:30 PST	0.00[A]	55.4[A]	170[A]	278[A]	280[A]	241[A]	331[A]	265[A]	280[A]	74.3[A]	77.2[A]	65.8[A]	75.3[A]	101[A]	80.3[A]	140[A]	265[A]	294[A]	267[A]	9.62[A]	4.06[A]	2.35[A]
04:45 PST	0.00[A]	64.9[A]	193[A]	292[A]	280[A]	292[A]	340[A]	270[A]	284[A]	76.2[A]	72.3[A]	71.4[A]	78.2[A]	107[A]	80.3[A]	148[A]	261[A]	257[A]	282[A]	11.7[A]	5.04[A]	2.35[A]
05:00 PST	0.00[A]	69.5[A]	162[A]	278[A]	268[A]	265[A]	323[A]	270[A]	274[A]	68.5[A]	78.2[A]	67.6[A]	72.3[A]	95.4[A]	73.3[A]	156[A]	280[A]	280[A]	274[A]	10.3[A]	5.28[A]	2.35[A]
05:15 PST	0.00[A]	50.6[A]	181[A]	346[A]	261[A]	308[A]	298[A]	270[A]	270[A]	72.3[A]	79.3[A]	75.3[A]	73.3[A]	87.6[A]	80.3[A]	156[A]	268[A]	265[A]	250[A]	10.3[A]	5.28[A]	2.35[A]
05:30 PST	0.00[A]	43.2[A]	176[A]	261[A]	298[A]	278[A]	292[A]	329[A]	265[A]	72.3[A]	75.3[A]	79.3[A]	73.3[A]	103[A]	67.6[A]	165[A]	274[A]	270[A]	272[A]	11.0[A]	5.28[A]	2.35[A]
05:45 PST	0.00[A]	53.8[A]	189[A]	259[A]	296[A]	265[A]	344[A]	246[A]	282[A]	78.2[A]	68.5[A]	73.3[A]	74.3[A]	85.5[A]	74.3[A]	144[A]	278[A]	267[A]	274[A]	9.62[A]	5.28[A]	2.55[A]
06:00 PST	0.00[A]	48.3[A]	151[A]	290[A]	302[A]	335[A]	342[A]	237[A]	278[A]	70.4[A]	80.3[A]	72.3[A]	69.5[A]	95.4[A]	79.3[A]	144[A]	276[A]	276[A]	290[A]	9.62[A]	5.28[A]	2.35[A]
06:15 PST	0.00[A]	63.1[A]	171[A]	270[A]	265[A]	302[A]	298[A]	276[A]	302[A]	72.3[A]	79.3[A]	74.3[A]	68.5[A]	103[A]	75.3[A]	145[A]	272[A]	274[A]	270[A]	10.3[A]	4.69[A]	2.35[A]
06:30 PST	0.00[A]	63.1[A]	153[A]	268[A]	338[A]	250[A]	314[A]	280[A]	274[A]	73.3[A]	66.7[A]	74.3[A]	63.1[A]	84.4[A]	76.2[A]	153[A]	252[A]	282[A]	263[A]	10.0[A]	5.04[A]	2.55[A]
06:45 PST	0.00[A]	68.5[A]	155[A]	294[A]	270[A]	268[A]	304[A]	286[A]	265[A]	73.3[A]	80.3[A]	72.3[A]	71.4[A]	92.0[A]	67.6[A]	136[A]	280[A]	263[A]	243[A]	9.25[A]	5.04[A]	2.16[A]
07:00 PST	0.00[A]	66.7[A]	182[A]	294[A]	278[A]	252[A]	340[A]	252[A]	292[A]	71.4[A]	75.3[A]	74.3[A]	69.5[A]	85.5[A]	73.3[A]	130[A]	270[A]	274[A]	274[A]	9.62[A]	4.69[A]	2.16[A]
07:15 PST	0.00[A]	68.5[A]	182[A]	282[A]	292[A]	286[A]	327[A]	276[A]	286[A]	68.5[A]	72.3[A]	70.4[A]	74.3[A]	92.0[A]	69.5[A]	153[A]	253[A]	284[A]	248[A]	8.88[A]	5.04[A]	2.35[A]

TIME	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5	Feb 6	Feb 7	Feb 8	Feb 9	Feb 10	Feb 11	Feb 12	Feb 13	Feb 14	Feb 15	Feb 16	Feb 17	Feb 18
07:30 PST	0.00[A]	57.9[A]	167[A]	280[A]	265[A]	288[A]	304[A]	268[A]	284[A]	73.3[A]	75.3[A]	79.3[A]	61.3[A]	81.3[A]	79.3[A]	171[A]	282[A]	230[A]	270[A]	8.53[A]	5.04[A]	2.16[A]
07:45 PST	0.00[A]	54.6[A]	190[A]	280[A]	268[A]	288[A]	300[A]	263[A]	276[A]	73.3[A]	85.5[A]	74.3[A]	73.3[A]	95.4[A]	65.8[A]	145[A]	274[A]	272[A]	267[A]	8.88[A]	4.37[A]	2.16[A]
08:00 PST	0.00[A]	53.0[A]	179[A]	296[A]	268[A]	286[A]	302[A]	270[A]	259[A]	71.4[A]	100[A]	75.3[A]	69.5[A]	86.6[A]	72.3[A]	164[A]	267[A]	276[A]	286[A]	9.62[A]	4.37[A]	2.35[A]
08:15 PST	0.00[A]	49.8[A]	187[A]	248[A]	267[A]	261[A]	316[A]	278[A]	284[A]	73.3[A]	83.4[A]	77.2[A]	69.5[A]	89.8[A]	70.4[A]	140[A]	290[A]	257[A]	280[A]	8.53[A]	4.69[A]	2.16[A]
08:30 PST	0.00[A]	49.1[A]	152[A]	314[A]	314[A]	306[A]	323[A]	259[A]	237[A]	75.3[A]	86.6[A]	71.4[A]	73.3[A]	88.7[A]	60.5[A]	149[A]	268[A]	257[A]	272[A]	9.25[A]	4.69[A]	1.99[A]
08:45 PST	0.00[A]	51.4[A]	170[A]	278[A]	272[A]	286[A]	314[A]	284[A]	259[A]	67.6[A]	67.6[A]	70.4[A]	67.6[A]	84.4[A]	80.3[A]	151[A]	300[A]	276[A]	292[A]	8.53[A]	3.49[A]	1.99[A]
09:00 PST	0.00[A]	49.8[A]	168[A]	292[A]	302[A]	290[A]	310[A]	290[A]	284[A]	71.4[A]	81.3[A]	67.6[A]	73.3[A]	93.1[A]	68.5[A]	148[A]	286[A]	276[A]	263[A]	7.86[A]	4.06[A]	2.16[A]
09:15 PST	0.00[A]	48.3[A]	170[A]	268[A]	278[A]	272[A]	310[A]	270[A]	253[A]	80.3[A]	84.4[A]	74.3[A]	66.7[A]	87.6[A]	73.3[A]	158[A]	239[A]	276[A]	292[A]	7.86[A]	4.37[A]	2.35[A]
09:30 PST	0.00[A]	59.6[A]	153[A]	259[A]	318[A]	282[A]	316[A]	267[A]	288[A]	71.4[A]	90.9[A]	78.2[A]	70.4[A]	87.6[A]	64.0[A]	153[A]	284[A]	272[A]	280[A]	8.53[A]	4.37[A]	2.16[A]
09:45 PST	0.00[A]	63.1[A]	190[A]	290[A]	274[A]	340[A]	278[A]	286[A]	282[A]	69.5[A]	84.4[A]	70.4[A]	73.3[A]	82.3[A]	79.3[A]	133[A]	272[A]	261[A]	265[A]	6.62[A]	4.37[A]	2.16[A]
10:00 PST	0.00[A]	63.1[A]	184[A]	314[A]	276[A]	296[A]	272[A]	276[A]	276[A]	71.4[A]	94.3[A]	73.3[A]	72.3[A]	97.7[A]	64.0[A]	164[A]	294[A]	253[A]	270[A]	7.54[A]	4.06[A]	2.16[A]
10:15 PST	0.00[A]	62.2[A]	152[A]	308[A]	325[A]	292[A]	318[A]	282[A]	284[A]	75.3[A]	95.4[A]	61.3[A]	62.2[A]	85.5[A]	75.3[A]	146[A]	267[A]	286[A]	253[A]	8.19[A]	3.77[A]	1.99[A]
10:30 PST	0.00[A]	62.2[A]	181[A]	316[A]	253[A]	280[A]	288[A]	284[A]	243[A]	72.3[A]	92.0[A]	68.5[A]	71.4[A]	88.7[A]	74.3[A]	133[A]	298[A]	270[A]	272[A]	7.22[A]	4.06[A]	2.16[A]
10:45 PST	0.00[A]	54.6[A]	151[A]	304[A]	304[A]	318[A]	282[A]	270[A]	290[A]	72.3[A]	73.3[A]	70.4[A]	69.5[A]	92.0[A]	73.3[A]	148[A]	252[A]	276[A]	286[A]	7.22[A]	3.77[A]	1.99[A]
11:00 PST	0.00[A]	54.6[A]	155[A]	333[A]	318[A]	320[A]	270[A]	272[A]	314[A]	74.3[A]	82.3[A]	71.4[A]	72.3[A]	81.3[A]	58.7[A]	148[A]	259[A]	252[A]	284[A]	6.34[A]	3.77[A]	2.16[A]
11:15 PST	0.00[A]	52.2[A]	198[A]	272[A]	243[A]	290[A]	259[A]	284[A]	290[A]	77.2[A]	75.3[A]	70.4[A]	69.5[A]	80.3[A]	77.2[A]	133[A]	244[A]	257[A]	222[A]	6.92[A]	3.49[A]	1.99[A]
11:30 PST	0.00[A]	49.1[A]	193[A]	253[A]	270[A]	284[A]	304[A]	278[A]	263[A]	76.2[A]	83.4[A]	65.8[A]	78.2[A]	80.3[A]	77.2[A]	165[A]	286[A]	286[A]	141[A]	6.92[A]	3.77[A]	1.99[A]
11:45 PST	0.00[A]	61.3[A]	215[A]	304[A]	286[A]	306[A]	284[A]	284[A]	308[A]	74.3[A]	73.3[A]	64.9[A]	76.2[A]	73.3[A]	83.4[A]	142[A]	274[A]	270[A]	113[A]	8.19[A]	3.77[A]	1.99[A]
12:00 PST	0.00[A]	73.3[A]	192[A]	338[A]	312[A]	286[A]	274[A]	280[A]	250[A]	84.4[A]	80.3[A]	64.9[A]	70.4[A]	80.3[A]	119[A]	164[A]	255[A]	272[A]	82.3[A]	12.4[A]	3.49[A]	1.99[A]
12:15 PST	0.00[A]	94.3[A]	310[A]	288[A]	288[A]	267[A]	261[A]	282[A]	298[A]	86.6[A]	81.3[A]	71.4[A]	73.3[A]	73.3[A]	121[A]	146[A]	276[A]	272[A]	67.6[A]	8.53[A]	3.49[A]	1.99[A]
12:30 PST	0.00[A]	114[A]	255[A]	298[A]	327[A]	296[A]	265[A]	304[A]	286[A]	95.4[A]	80.3[A]	72.3[A]	82.3[A]	80.3[A]	140[A]	153[A]	286[A]	292[A]	57.1[A]	7.22[A]	3.49[A]	1.99[A]
12:45 PST	0.00[A]	130[A]	306[A]	312[A]	278[A]	268[A]	267[A]	278[A]	298[A]	103[A]	74.3[A]	71.4[A]	63.1[A]	80.3[A]	149[A]	159[A]	292[A]	310[A]	49.1[A]	6.62[A]	3.49[A]	1.99[A]
13:00 PST	0.00[A]	151[A]	241[A]	302[A]	267[A]	280[A]	312[A]	312[A]	265[A]	107[A]	76.2[A]	70.4[A]	75.3[A]	86.6[A]	146[A]	149[A]	272[A]	246[A]	49.1[A]	6.92[A]	4.06[A]	1.99[A]
13:15 PST	0.00[A]	149[A]	278[A]	253[A]	288[A]	302[A]	296[A]	274[A]	304[A]	100[A]	66.7[A]	74.3[A]	74.3[A]	90.9[A]	138[A]	155[A]	259[A]	261[A]	49.1[A]	6.62[A]	3.49[A]	2.16[A]
13:30 PST	0.00[A]	149[A]	280[A]	338[A]	302[A]	294[A]	300[A]	268[A]	294[A]	100[A]	64.9[A]	75.3[A]	63.1[A]	75.3[A]	142[A]	171[A]	292[A]	250[A]	42.5[A]	7.22[A]	3.77[A]	1.99[A]
13:45 PST	0.00[A]	149[A]	338[A]	302[A]	300[A]	268[A]	294[A]	282[A]	243[A]	100[A]	80.3[A]	71.4[A]	70.4[A]	79.3[A]	137[A]	152[A]	250[A]	280[A]	37.7[A]	6.62[A]	3.77[A]	1.83[A]
14:00 PST	0.00[A]	158[A]	284[A]	278[A]	327[A]	276[A]	280[A]	270[A]	255[A]	107[A]	76.2[A]	62.2[A]	71.4[A]	70.4[A]	158[A]	137[A]	263[A]	268[A]	35.2[A]	5.79[A]	4.06[A]	1.83[A]
14:15 PST	0.00[A]	151[A]	308[A]	282[A]	280[A]	312[A]	267[A]	296[A]	268[A]	121[A]	82.3[A]	71.4[A]	66.7[A]	82.3[A]	142[A]	161[A]	263[A]	263[A]	37.1[A]	6.62[A]	3.77[A]	1.83[A]
14:30 PST	0.00[A]	162[A]	261[A]	308[A]	312[A]	267[A]	268[A]	290[A]	267[A]	120[A]	79.3[A]	75.3[A]	79.3[A]	84.4[A]	165[A]	149[A]	261[A]	296[A]	33.3[A]	5.53[A]	3.49[A]	1.99[A]
14:45 PST	0.00[A]	155[A]	278[A]	292[A]	304[A]	270[A]	272[A]	268[A]	257[A]	102[A]	76.2[A]	71.4[A]	69.5[A]	69.5[A]	138[A]	138[A]	259[A]	257[A]	33.9[A]	6.34[A]	3.23[A]	1.83[A]
15:00 PST	0.00[A]	159[A]	280[A]	316[A]	318[A]	292[A]	294[A]	265[A]	267[A]	96.5[A]	73.3[A]	67.6[A]	80.3[A]	77.2[A]	137[A]	171[A]	282[A]	276[A]	30.9[A]	6.06[A]	3.49[A]	1.67[A]

TIME	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5	Feb 6	Feb 7	Feb 8	Feb 9	Feb 10	Feb 11	Feb 12	Feb 13	Feb 14	Feb 15	Feb 16	Feb 17	Feb 18
15:15 PST	0.00[A]	155[A]	308[A]	296[A]	286[A]	282[A]	261[A]	280[A]	267[A]	102[A]	67.6[A]	66.7[A]	70.4[A]	78.2[A]	151[A]	155[A]	263[A]	259[A]	23.8[A]	6.06[A]	3.23[A]	1.67[A]
15:30 PST	0.00[A]	170[A]	235[A]	308[A]	316[A]	323[A]	274[A]	310[A]	278[A]	81.3[A]	70.4[A]	69.5[A]	68.5[A]	66.7[A]	152[A]	149[A]	290[A]	265[A]	27.3[A]	5.79[A]	3.23[A]	1.67[A]
15:45 PST	0.00[A]	165[A]	246[A]	331[A]	267[A]	284[A]	272[A]	259[A]	276[A]	85.5[A]	70.4[A]	74.3[A]	78.2[A]	83.4[A]	146[A]	152[A]	280[A]	288[A]	26.7[A]	6.34[A]	2.99[A]	1.83[A]
16:00 PST	0.00[A]	159[A]	270[A]	316[A]	288[A]	278[A]	270[A]	280[A]	274[A]	90.9[A]	75.3[A]	65.8[A]	72.3[A]	76.2[A]	162[A]	165[A]	263[A]	265[A]	23.8[A]	6.34[A]	3.49[A]	1.67[A]
16:15 PST	32.7[A]	168[A]	300[A]	272[A]	268[A]	252[A]	288[A]	298[A]	268[A]	88.7[A]	63.1[A]	71.4[A]	66.7[A]	75.3[A]	153[A]	144[A]	288[A]	286[A]	24.9[A]	6.34[A]	3.23[A]	1.83[A]
16:30 PST	51.4[A]	156[A]	246[A]	298[A]	276[A]	282[A]	261[A]	267[A]	250[A]	74.3[A]	67.6[A]	60.5[A]	72.3[A]	78.2[A]	142[A]	146[A]	276[A]	292[A]	21.7[A]	6.34[A]	3.49[A]	1.67[A]
16:45 PST	50.6[A]	173[A]	267[A]	261[A]	267[A]	280[A]	298[A]	278[A]	282[A]	86.6[A]	75.3[A]	75.3[A]	71.4[A]	72.3[A]	149[A]	146[A]	288[A]	268[A]	23.3[A]	6.92[A]	2.99[A]	1.99[A]
17:00 PST	57.9[A]	146[A]	267[A]	300[A]	300[A]	296[A]	270[A]	298[A]	237[A]	92.0[A]	69.5[A]	65.8[A]	68.5[A]	69.5[A]	145[A]	165[A]	253[A]	261[A]	22.7[A]	7.22[A]	3.49[A]	1.67[A]
17:15 PST	56.2[A]	161[A]	286[A]	320[A]	274[A]	288[A]	237[A]	304[A]	232[A]	87.6[A]	75.3[A]	75.3[A]	68.5[A]	80.3[A]	152[A]	164[A]	276[A]	282[A]	22.2[A]	6.92[A]	3.23[A]	1.83[A]
17:30 PST	57.1[A]	158[A]	294[A]	265[A]	270[A]	284[A]	265[A]	276[A]	174[A]	78.2[A]	74.3[A]	75.3[A]	63.1[A]	69.5[A]	155[A]	185[A]	278[A]	263[A]	27.3[A]	5.79[A]	2.99[A]	1.83[A]
17:45 PST	63.1[A]	148[A]	235[A]	282[A]	333[A]	282[A]	232[A]	276[A]	126[A]	78.2[A]	68.5[A]	73.3[A]	66.7[A]	73.3[A]	168[A]	213[A]	259[A]	259[A]	28.5[A]	6.34[A]	2.99[A]	1.99[A]
18:00 PST	59.6[A]	167[A]	257[A]	270[A]	290[A]	282[A]	261[A]	268[A]	96.5[A]	88.7[A]	71.4[A]	66.7[A]	77.2[A]	78.2[A]	130[A]	228[A]	290[A]	294[A]	27.3[A]	6.06[A]	2.99[A]	1.83[A]
18:15 PST	63.1[A]	164[A]	280[A]	294[A]	268[A]	304[A]	250[A]	253[A]	100[A]	80.3[A]	75.3[A]	69.5[A]	71.4[A]	71.4[A]	182[A]	252[A]	267[A]	267[A]	25.5[A]	5.28[A]	2.99[A]	1.67[A]
18:30 PST	58.7[A]	161[A]	272[A]	296[A]	316[A]	292[A]	284[A]	304[A]	83.4[A]	78.2[A]	79.3[A]	69.5[A]	73.3[A]	78.2[A]	152[A]	253[A]	255[A]	250[A]	23.8[A]	5.79[A]	2.99[A]	1.67[A]
18:45 PST	49.8[A]	164[A]	263[A]	296[A]	298[A]	282[A]	300[A]	292[A]	77.2[A]	88.7[A]	76.2[A]	70.4[A]	74.3[A]	86.6[A]	168[A]	263[A]	270[A]	248[A]	27.3[A]	5.28[A]	2.99[A]	1.67[A]
19:00 PST	55.4[A]	155[A]	280[A]	292[A]	280[A]	272[A]	318[A]	263[A]	87.6[A]	85.5[A]	84.4[A]	66.7[A]	80.3[A]	74.3[A]	165[A]	276[A]	263[A]	261[A]	22.7[A]	4.69[A]	2.99[A]	1.83[A]
19:15 PST	52.2[A]	165[A]	288[A]	292[A]	288[A]	294[A]	265[A]	270[A]	79.3[A]	73.3[A]	71.4[A]	66.7[A]	92.0[A]	82.3[A]	159[A]	237[A]	255[A]	278[A]	18.7[A]	5.79[A]	3.23[A]	1.67[A]
19:30 PST	65.8[A]	161[A]	263[A]	265[A]	276[A]	250[A]	241[A]	320[A]	78.2[A]	74.3[A]	70.4[A]	73.3[A]	114[A]	75.3[A]	137[A]	276[A]	267[A]	270[A]	17.7[A]	4.69[A]	2.99[A]	1.67[A]
19:45 PST	62.2[A]	168[A]	261[A]	280[A]	257[A]	308[A]	268[A]	286[A]	80.3[A]	88.7[A]	79.3[A]	71.4[A]	115[A]	74.3[A]	128[A]	263[A]	284[A]	265[A]	14.7[A]	5.28[A]	2.99[A]	1.83[A]
20:00 PST	57.9[A]	161[A]	267[A]	312[A]	292[A]	255[A]	306[A]	276[A]	76.2[A]	66.7[A]	82.3[A]	64.9[A]	116[A]	66.7[A]	137[A]	250[A]	270[A]	288[A]	14.7[A]	5.53[A]	2.99[A]	1.99[A]
20:15 PST	49.1[A]	165[A]	270[A]	304[A]	253[A]	265[A]	294[A]	268[A]	74.3[A]	72.3[A]	73.3[A]	72.3[A]	132[A]	77.2[A]	138[A]	265[A]	265[A]	276[A]	16.0[A]	5.28[A]	2.99[A]	1.67[A]
20:30 PST	46.1[A]	168[A]	284[A]	292[A]	270[A]	252[A]	294[A]	284[A]	70.4[A]	70.4[A]	67.6[A]	75.3[A]	113[A]	76.2[A]	162[A]	270[A]	255[A]	265[A]	14.7[A]	5.28[A]	2.99[A]	1.67[A]
20:45 PST	48.3[A]	161[A]	318[A]	308[A]	292[A]	304[A]	270[A]	274[A]	72.3[A]	75.3[A]	66.7[A]	71.4[A]	114[A]	79.3[A]	146[A]	282[A]	246[A]	270[A]	14.3[A]	5.79[A]	2.76[A]	1.53[A]
21:00 PST	46.1[A]	162[A]	248[A]	280[A]	331[A]	276[A]	280[A]	276[A]	78.2[A]	81.3[A]	68.5[A]	66.7[A]	128[A]	74.3[A]	145[A]	253[A]	255[A]	255[A]	15.1[A]	5.53[A]	2.76[A]	1.53[A]
21:15 PST	52.2[A]	170[A]	323[A]	261[A]	296[A]	259[A]	253[A]	280[A]	73.3[A]	73.3[A]	64.0[A]	69.5[A]	141[A]	65.8[A]	140[A]	246[A]	298[A]	282[A]	16.0[A]	6.92[A]	2.76[A]	1.83[A]
21:30 PST	39.0[A]	164[A]	286[A]	284[A]	274[A]	263[A]	276[A]	284[A]	79.3[A]	78.2[A]	79.3[A]	75.3[A]	149[A]	79.3[A]	140[A]	270[A]	294[A]	286[A]	15.5[A]	7.86[A]	2.76[A]	1.67[A]
21:45 PST	47.5[A]	146[A]	280[A]	331[A]	300[A]	274[A]	261[A]	294[A]	79.3[A]	88.7[A]	74.3[A]	70.4[A]	153[A]	76.2[A]	165[A]	274[A]	257[A]	263[A]	14.7[A]	8.88[A]	2.76[A]	1.67[A]
22:00 PST	50.6[A]	176[A]	280[A]	278[A]	280[A]	278[A]	282[A]	272[A]	67.6[A]	81.3[A]	69.5[A]	75.3[A]	155[A]	79.3[A]	145[A]	208[A]	296[A]	276[A]	14.3[A]	6.34[A]	2.99[A]	1.40[A]
22:15 PST	48.3[A]	162[A]	290[A]	274[A]	294[A]	296[A]	323[A]	320[A]	71.4[A]	85.5[A]	83.4[A]	71.4[A]	119[A]	79.3[A]	132[A]	292[A]	276[A]	288[A]	13.5[A]	6.06[A]	2.99[A]	1.53[A]
22:30 PST	60.5[A]	164[A]	325[A]	276[A]	298[A]	312[A]	250[A]	274[A]	70.4[A]	84.4[A]	74.3[A]	66.7[A]	144[A]	82.3[A]	145[A]	268[A]	257[A]	276[A]	14.3[A]	5.53[A]	2.55[A]	1.83[A]
22:45 PST	52.2[A]	165[A]	286[A]	298[A]	294[A]	306[A]	261[A]	272[A]	79.3[A]	92.0[A]	75.3[A]	76.2[A]	141[A]	66.7[A]	144[A]	265[A]	302[A]	286[A]	13.9[A]	7.54[A]	2.76[A]	1.53[A]

TIME	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5	Feb 6	Feb 7	Feb 8	Feb 9	Feb 10	Feb 11	Feb 12	Feb 13	Feb 14	Feb 15	Feb 16	Feb 17	Feb 18
23:00 PST	64.0[A]	171[A]	308[A]	323[A]	265[A]	267[A]	292[A]	286[A]	79.3[A]	85.5[A]	72.3[A]	67.6[A]	142[A]	71.4[A]	165[A]	263[A]	270[A]	298[A]	12.0[A]	7.86[A]	2.76[A]	1.53[A]
23:15 PST	51.4[A]	173[A]	286[A]	263[A]	310[A]	306[A]	284[A]	288[A]	70.4[A]	92.0[A]	66.7[A]	69.5[A]	126[A]	80.3[A]	145[A]	276[A]	253[A]	288[A]	12.4[A]	11.0[A]	2.55[A]	1.40[A]
23:30 PST	49.1[A]	165[A]	335[A]	284[A]	265[A]	290[A]	276[A]	286[A]	71.4[A]	105[A]	72.3[A]	72.3[A]	153[A]	74.3[A]	142[A]	274[A]	325[A]	270[A]	12.4[A]	5.79[A]	2.76[A]	1.53[A]
23:45 PST	51.4[A]	174[A]	278[A]	288[A]	278[A]	320[A]	270[A]	267[A]	75.3[A]	92.0[A]	73.3[A]	74.3[A]	126[A]	71.4[A]	144[A]	210[A]	263[A]	288[A]	12.8[A]	7.86[A]	2.55[A]	1.53[A]
COUNT	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**
MAX	**65.8**	**176**	**338**	**353**	**338**	**346**	**344**	**329**	**314**	**121**	**100**	**80.3**	**155**	**140**	**182**	**292**	**325**	**310**	**294**	**14.7**	**11.0**	**2.99**
MIN	**0.00**	**43.2**	**149**	**248**	**243**	**241**	**223**	**237**	**67.6**	**64.0**	**62.2**	**60.5**	**58.7**	**65.8**	**58.7**	**128**	**222**	**230**	**12.0**	**4.69**	**2.55**	**1.40**

Explanation

A	Approved for publication -- Processing and review completed.

2012

Discharge, cubic feet per second

TIME	Jan 24	Jan 25	Jan 26	Jan 27	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5	Feb 6	Feb 7	Feb 8	Feb 9	Feb 10	Feb 11
00:00 PST	10.6[A]	47.5[A]	121[A]	268[A]	325[A]	365[A]	355[A]	344[A]	367[A]	340[A]	358[A]	355[A]	388[A]	381[A]	225[A]	237[A]	381[A]	355[A]	26.7[A]
00:15 PST	10.6[A]	44.6[A]	125[A]	252[A]	335[A]	351[A]	365[A]	338[A]	342[A]	346[A]	367[A]	379[A]	349[A]	355[A]	228[A]	243[A]	333[A]	358[A]	26.1[A]
00:30 PST	11.0[A]	47.5[A]	120[A]	253[A]	376[A]	355[A]	358[A]	344[A]	351[A]	342[A]	346[A]	372[A]	381[A]	395[A]	223[A]	230[A]	346[A]	372[A]	26.1[A]
00:45 PST	10.6[A]	49.1[A]	119[A]	255[A]	335[A]	346[A]	344[A]	342[A]	360[A]	365[A]	372[A]	367[A]	383[A]	381[A]	234[A]	222[A]	365[A]	353[A]	25.5[A]
01:00 PST	11.0[A]	49.1[A]	125[A]	268[A]	344[A]	355[A]	369[A]	362[A]	338[A]	333[A]	358[A]	367[A]	379[A]	390[A]	225[A]	243[A]	353[A]	362[A]	24.4[A]
01:15 PST	12.8[A]	49.1[A]	128[A]	253[A]	349[A]	342[A]	353[A]	329[A]	346[A]	360[A]	346[A]	372[A]	381[A]	398[A]	230[A]	225[A]	369[A]	360[A]	23.3[A]
01:30 PST	12.4[A]	44.6[A]	130[A]	253[A]	358[A]	340[A]	355[A]	340[A]	358[A]	351[A]	376[A]	314[A]	386[A]	388[A]	227[A]	235[A]	353[A]	362[A]	23.3[A]
01:45 PST	12.4[A]	46.8[A]	120[A]	257[A]	349[A]	365[A]	365[A]	327[A]	353[A]	355[A]	355[A]	372[A]	374[A]	376[A]	230[A]	218[A]	365[A]	355[A]	22.7[A]
02:00 PST	12.4[A]	46.8[A]	124[A]	250[A]	346[A]	351[A]	331[A]	351[A]	342[A]	353[A]	355[A]	369[A]	386[A]	390[A]	230[A]	228[A]	353[A]	365[A]	22.2[A]
02:15 PST	12.4[A]	48.3[A]	123[A]	253[A]	353[A]	349[A]	351[A]	338[A]	355[A]	374[A]	369[A]	367[A]	367[A]	342[A]	237[A]	227[A]	362[A]	358[A]	20.6[A]
02:30 PST	12.8[A]	47.5[A]	129[A]	270[A]	312[A]	365[A]	340[A]	338[A]	346[A]	353[A]	358[A]	365[A]	374[A]	386[A]	237[A]	243[A]	360[A]	349[A]	20.6[A]
02:45 PST	13.1[A]	44.6[A]	115[A]	272[A]	333[A]	318[A]	333[A]	353[A]	365[A]	351[A]	360[A]	369[A]	381[A]	362[A]	232[A]	225[A]	369[A]	360[A]	21.1[A]
03:00 PST	13.5[A]	43.9[A]	133[A]	257[A]	329[A]	329[A]	353[A]	340[A]	318[A]	316[A]	360[A]	379[A]	342[A]	398[A]	237[A]	235[A]	365[A]	372[A]	21.7[A]
03:15 PST	13.1[A]	47.5[A]	128[A]	248[A]	342[A]	362[A]	331[A]	351[A]	367[A]	351[A]	346[A]	383[A]	369[A]	374[A]	223[A]	208[A]	360[A]	367[A]	20.1[A]
03:30 PST	13.9[A]	45.3[A]	118[A]	263[A]	327[A]	349[A]	340[A]	351[A]	323[A]	349[A]	344[A]	365[A]	351[A]	365[A]	235[A]	232[A]	365[A]	379[A]	19.6[A]
03:45 PST	13.5[A]	49.1[A]	130[A]	263[A]	333[A]	335[A]	351[A]	338[A]	318[A]	331[A]	379[A]	383[A]	365[A]	374[A]	227[A]	230[A]	372[A]	349[A]	18.7[A]
04:00 PST	15.1[A]	46.8[A]	119[A]	253[A]	360[A]	351[A]	342[A]	369[A]	342[A]	353[A]	362[A]	376[A]	369[A]	386[A]	237[A]	237[A]	374[A]	360[A]	18.7[A]
04:15 PST	14.7[A]	44.6[A]	110[A]	252[A]	346[A]	353[A]	351[A]	355[A]	369[A]	351[A]	353[A]	379[A]	379[A]	383[A]	239[A]	252[A]	353[A]	362[A]	18.7[A]
04:30 PST	14.3[A]	46.8[A]	132[A]	270[A]	358[A]	353[A]	344[A]	349[A]	340[A]	360[A]	367[A]	360[A]	367[A]	374[A]	222[A]	232[A]	369[A]	369[A]	18.2[A]
04:45 PST	15.1[A]	48.3[A]	120[A]	270[A]	342[A]	340[A]	342[A]	372[A]	327[A]	349[A]	358[A]	379[A]	374[A]	379[A]	237[A]	234[A]	346[A]	351[A]	17.7[A]
05:00 PST	15.5[A]	47.5[A]	130[A]	263[A]	346[A]	355[A]	365[A]	323[A]	353[A]	358[A]	367[A]	362[A]	367[A]	374[A]	228[A]	237[A]	344[A]	331[A]	17.3[A]
05:15 PST	17.7[A]	48.3[A]	119[A]	274[A]	358[A]	369[A]	360[A]	331[A]	358[A]	360[A]	360[A]	358[A]	376[A]	390[A]	230[A]	216[A]	372[A]	372[A]	18.2[A]
05:30 PST	15.1[A]	50.6[A]	125[A]	272[A]	335[A]	346[A]	325[A]	360[A]	349[A]	362[A]	360[A]	360[A]	351[A]	388[A]	235[A]	232[A]	362[A]	316[A]	17.3[A]
05:45 PST	14.7[A]	48.3[A]	121[A]	257[A]	344[A]	351[A]	351[A]	327[A]	372[A]	351[A]	358[A]	379[A]	372[A]	400[A]	239[A]	232[A]	369[A]	362[A]	16.4[A]
06:00 PST	16.0[A]	47.5[A]	125[A]	272[A]	351[A]	335[A]	342[A]	340[A]	346[A]	360[A]	355[A]	372[A]	386[A]	388[A]	227[A]	230[A]	349[A]	358[A]	16.4[A]
06:15 PST	16.4[A]	49.1[A]	136[A]	268[A]	346[A]	346[A]	349[A]	342[A]	338[A]	335[A]	365[A]	369[A]	376[A]	374[A]	223[A]	234[A]	376[A]	360[A]	16.0[A]
06:30 PST	15.5[A]	47.5[A]	119[A]	274[A]	360[A]	298[A]	344[A]	346[A]	353[A]	338[A]	369[A]	381[A]	360[A]	393[A]	225[A]	243[A]	325[A]	360[A]	15.5[A]
06:45 PST	16.0[A]	48.3[A]	124[A]	276[A]	369[A]	331[A]	358[A]	355[A]	353[A]	362[A]	327[A]	376[A]	372[A]	367[A]	239[A]	230[A]	362[A]	325[A]	15.5[A]
07:00 PST	14.7[A]	49.1[A]	119[A]	270[A]	331[A]	329[A]	355[A]	355[A]	355[A]	367[A]	358[A]	365[A]	355[A]	360[A]	234[A]	241[A]	381[A]	353[A]	15.1[A]
07:15 PST	16.4[A]	50.6[A]	124[A]	280[A]	340[A]	338[A]	369[A]	358[A]	318[A]	358[A]	365[A]	372[A]	351[A]	358[A]	239[A]	225[A]	360[A]	365[A]	14.3[A]

TIME	Jan 24	Jan 25	Jan 26	Jan 27	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5	Feb 6	Feb 7	Feb 8	Feb 9	Feb 10	Feb 11
07:30 PST	15.5[A]	50.6[A]	115[A]	286[A]	331[A]	331[A]	383[A]	360[A]	344[A]	355[A]	360[A]	360[A]	374[A]	351[A]	215[A]	216[A]	372[A]	372[A]	15.5[A]
07:45 PST	16.4[A]	45.3[A]	120[A]	278[A]	342[A]	314[A]	360[A]	333[A]	325[A]	358[A]	383[A]	381[A]	376[A]	376[A]	239[A]	235[A]	353[A]	367[A]	15.1[A]
08:00 PST	16.4[A]	46.1[A]	119[A]	284[A]	349[A]	340[A]	338[A]	360[A]	335[A]	362[A]	365[A]	369[A]	365[A]	398[A]	222[A]	235[A]	353[A]	369[A]	14.7[A]
08:15 PST	16.0[A]	46.8[A]	113[A]	284[A]	367[A]	358[A]	338[A]	351[A]	338[A]	349[A]	338[A]	386[A]	369[A]	372[A]	227[A]	227[A]	355[A]	353[A]	14.3[A]
08:30 PST	16.4[A]	47.5[A]	110[A]	274[A]	355[A]	355[A]	365[A]	362[A]	344[A]	360[A]	360[A]	369[A]	379[A]	362[A]	235[A]	241[A]	360[A]	369[A]	12.8[A]
08:45 PST	16.4[A]	52.2[A]	121[A]	268[A]	353[A]	353[A]	351[A]	355[A]	353[A]	346[A]	383[A]	369[A]	379[A]	329[A]	227[A]	237[A]	381[A]	346[A]	12.4[A]
09:00 PST	16.0[A]	49.1[A]	119[A]	278[A]	346[A]	333[A]	333[A]	349[A]	338[A]	369[A]	369[A]	331[A]	355[A]	381[A]	234[A]	239[A]	351[A]	335[A]	12.8[A]
09:15 PST	16.4[A]	46.1[A]	112[A]	280[A]	333[A]	344[A]	374[A]	349[A]	349[A]	369[A]	362[A]	388[A]	379[A]	381[A]	230[A]	234[A]	353[A]	358[A]	14.3[A]
09:30 PST	16.0[A]	49.1[A]	121[A]	286[A]	351[A]	342[A]	333[A]	355[A]	344[A]	351[A]	355[A]	386[A]	365[A]	383[A]	218[A]	243[A]	358[A]	367[A]	13.9[A]
09:45 PST	16.8[A]	51.4[A]	110[A]	284[A]	362[A]	358[A]	340[A]	362[A]	365[A]	362[A]	349[A]	365[A]	358[A]	372[A]	239[A]	241[A]	365[A]	360[A]	13.1[A]
10:00 PST	16.4[A]	51.4[A]	115[A]	282[A]	362[A]	353[A]	362[A]	304[A]	353[A]	351[A]	360[A]	369[A]	383[A]	362[A]	237[A]	239[A]	369[A]	355[A]	13.1[A]
10:15 PST	16.8[A]	50.6[A]	118[A]	282[A]	360[A]	349[A]	365[A]	346[A]	360[A]	353[A]	346[A]	367[A]	379[A]	367[A]	210[A]	222[A]	314[A]	338[A]	12.4[A]
10:30 PST	16.8[A]	51.4[A]	113[A]		355[A]	358[A]	365[A]	358[A]	355[A]	325[A]	362[A]	388[A]	390[A]	393[A]	228[A]	228[A]	369[A]	358[A]	12.8[A]
10:45 PST	16.4[A]	50.6[A]	125[A]	288[A]	360[A]	349[A]	338[A]	338[A]	355[A]	372[A]	355[A]	372[A]	353[A]	365[A]	216[A]	241[A]	367[A]	335[A]	12.0[A]
11:00 PST	16.4[A]	46.1[A]	110[A]	278[A]	344[A]	360[A]	374[A]	358[A]	351[A]	349[A]	360[A]	374[A]	376[A]	376[A]	234[A]	265[A]	376[A]	376[A]	12.4[A]
11:15 PST	16.8[A]	44.6[A]	121[A]	280[A]	353[A]	355[A]	365[A]	360[A]	351[A]	360[A]	349[A]	383[A]	365[A]	388[A]	243[A]	308[A]	358[A]	344[A]	12.8[A]
11:30 PST	17.3[A]	50.6[A]	129[A]	294[A]	360[A]	355[A]	369[A]	367[A]	362[A]	365[A]	367[A]	358[A]	372[A]	365[A]	241[A]	342[A]	365[A]	346[A]	11.7[A]
11:45 PST	16.4[A]	49.1[A]	119[A]	282[A]	349[A]	346[A]	351[A]	346[A]	349[A]	360[A]	365[A]	365[A]	333[A]	381[A]	241[A]	329[A]	346[A]	365[A]	12.0[A]
12:00 PST	16.4[A]	46.1[A]	123[A]	290[A]	355[A]	358[A]	349[A]	362[A]	355[A]	346[A]	372[A]	381[A]	383[A]	376[A]	241[A]	349[A]	353[A]	355[A]	12.0[A]
12:15 PST	17.3[A]	51.4[A]	129[A]	288[A]	362[A]	351[A]	320[A]	358[A]	358[A]	340[A]	331[A]	374[A]	381[A]	388[A]	237[A]	360[A]	369[A]	367[A]	11.3[A]
12:30 PST	16.8[A]	49.8[A]	146[A]	296[A]	335[A]	346[A]	358[A]	360[A]	340[A]	346[A]	355[A]	365[A]	374[A]	379[A]	235[A]	367[A]	369[A]	360[A]	11.7[A]
12:45 PST	17.3[A]	49.8[A]	153[A]	284[A]	351[A]	358[A]	349[A]	365[A]	344[A]	369[A]	372[A]	360[A]	351[A]	367[A]	232[A]	369[A]	360[A]	329[A]	11.7[A]
13:00 PST	16.8[A]	64.0[A]	168[A]	286[A]	344[A]	349[A]	351[A]	331[A]	360[A]	351[A]	381[A]	365[A]	386[A]	381[A]	243[A]	362[A]	351[A]	369[A]	10.6[A]
13:15 PST	17.3[A]	75.3[A]	195[A]	284[A]	358[A]	329[A]	365[A]	323[A]	346[A]	353[A]	338[A]	362[A]	369[A]	374[A]	225[A]	365[A]	358[A]	355[A]	11.3[A]
13:30 PST	16.8[A]		205[A]	284[A]	369[A]	349[A]	367[A]	346[A]	360[A]	327[A]	329[A]	367[A]	346[A]	383[A]	230[A]	367[A]	358[A]	365[A]	11.3[A]
13:45 PST	16.4[A]	95.4[A]	192[A]	274[A]	338[A]	360[A]	340[A]	362[A]	344[A]	367[A]	358[A]	369[A]	379[A]	335[A]	223[A]	355[A]	351[A]	358[A]	10.6[A]
14:00 PST	16.0[A]	106[A]	215[A]	300[A]	362[A]	353[A]	362[A]	367[A]	338[A]	353[A]	367[A]	367[A]	355[A]	381[A]	230[A]	367[A]	374[A]	340[A]	10.6[A]
14:15 PST	16.4[A]		192[A]	270[A]	344[A]	362[A]	323[A]	355[A]	362[A]	353[A]	353[A]	346[A]	360[A]	390[A]	235[A]	365[A]	360[A]	325[A]	10.6[A]
14:30 PST	16.8[A]	125[A]	211[A]	298[A]	344[A]	349[A]	376[A]	353[A]	369[A]	340[A]	369[A]	379[A]	390[A]	338[A]	216[A]	365[A]	372[A]	355[A]	10.0[A]
14:45 PST	20.1[A]		220[A]	292[A]	344[A]	335[A]	349[A]	351[A]	353[A]	365[A]	358[A]	372[A]	386[A]	388[A]	241[A]	365[A]	338[A]	351[A]	10.6[A]
15:00 PST	22.7[A]		218[A]	300[A]	353[A]	338[A]	338[A]	325[A]	355[A]	367[A]	367[A]	374[A]	365[A]	353[A]	228[A]	365[A]	362[A]	344[A]	11.3[A]

TIME	Jan 24	Jan 25	Jan 26	Jan 27	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5	Feb 6	Feb 7	Feb 8	Feb 9	Feb 10	Feb 11
15:15 PST	28.5[A]	124[A]	215[A]	286[A]	323[A]	360[A]	340[A]	355[A]	351[A]	349[A]	369[A]	376[A]	365[A]	379[A]	227[A]	360[A]	346[A]	358[A]	10.3[A]
15:30 PST	37.1[A]	125[A]	239[A]	272[A]	362[A]	349[A]	365[A]	344[A]	353[A]	353[A]	360[A]	355[A]	365[A]	393[A]	234[A]	338[A]	376[A]	365[A]	10.6[A]
15:45 PST	37.7[A]	128[A]	239[A]	286[A]	349[A]	349[A]	342[A]	349[A]	355[A]	346[A]	320[A]	383[A]	390[A]	376[A]	230[A]	362[A]	365[A]	331[A]	10.6[A]
16:00 PST	41.1[A]	120[A]	220[A]	292[A]	349[A]	360[A]	358[A]	372[A]	365[A]	365[A]	386[A]	372[A]	379[A]	369[A]	220[A]	353[A]	365[A]	333[A]	9.62[A]
16:15 PST	44.6[A]	126[A]	234[A]	298[A]	365[A]	355[A]	340[A]	333[A]	340[A]	362[A]	372[A]	362[A]	372[A]	367[A]	215[A]	386[A]	369[A]	312[A]	9.62[A]
16:30 PST	40.4[A]	126[A]	241[A]	292[A]	358[A]	340[A]	344[A]	333[A]	362[A]	344[A]	353[A]	374[A]	374[A]	367[A]	222[A]	369[A]	331[A]	222[A]	10.6[A]
16:45 PST	45.3[A]	129[A]	250[A]	286[A]	367[A]	362[A]	351[A]	342[A]	346[A]	353[A]	381[A]	340[A]	381[A]	376[A]	227[A]	358[A]	369[A]	144[A]	10.0[A]
17:00 PST	46.8[A]	129[A]	250[A]	261[A]	358[A]	346[A]	353[A]	358[A]	381[A]	342[A]	362[A]	365[A]	383[A]	346[A]	237[A]	372[A]	362[A]	121[A]	10.0[A]
17:15 PST	48.3[A]	126[A]	253[A]	286[A]	344[A]	344[A]	353[A]	355[A]	358[A]	367[A]	376[A]	340[A]	360[A]	369[A]	216[A]	338[A]	355[A]	98.8[A]	9.25[A]
17:30 PST	49.1[A]	133[A]	248[A]	274[A]	365[A]	362[A]	362[A]	346[A]	349[A]	344[A]	365[A]	360[A]	367[A]	335[A]	235[A]	372[A]	362[A]	86.6[A]	8.88[A]
17:45 PST	46.1[A]	134[A]	241[A]	284[A]	355[A]	353[A]	333[A]	349[A]	360[A]	353[A]	379[A]	369[A]	379[A]	302[A]	232[A]	360[A]	362[A]	82.3[A]	9.62[A]
18:00 PST	49.8[A]	145[A]	244[A]	276[A]	329[A]	362[A]	353[A]	333[A]	351[A]	365[A]	367[A]	381[A]	376[A]	272[A]	237[A]	376[A]	360[A]	89.8[A]	10.6[A]
18:15 PST	49.8[A]	142[A]	261[A]	298[A]	353[A]	353[A]	349[A]	308[A]	360[A]	346[A]	360[A]	367[A]	390[A]	257[A]	227[A]	333[A]	369[A]	86.6[A]	9.25[A]
18:30 PST	49.8[A]	140[A]	276[A]	290[A]	351[A]	360[A]	367[A]	338[A]	362[A]	344[A]	374[A]	360[A]	376[A]	255[A]	246[A]	355[A]	367[A]	77.2[A]	8.88[A]
18:45 PST	50.6[A]	133[A]	268[A]	284[A]	355[A]	342[A]	360[A]	365[A]	318[A]	362[A]	367[A]	367[A]	390[A]	234[A]	225[A]	369[A]	367[A]	71.4[A]	8.88[A]
19:00 PST	49.1[A]	138[A]	272[A]	282[A]	349[A]	346[A]	365[A]	340[A]	340[A]	353[A]	367[A]	360[A]	340[A]	244[A]	235[A]	349[A]	355[A]	66.7[A]	8.88[A]
19:15 PST	49.8[A]	130[A]	259[A]	302[A]	360[A]	351[A]	331[A]	374[A]	344[A]	358[A]	365[A]	388[A]	379[A]	234[A]	230[A]	360[A]	349[A]	61.3[A]	8.53[A]
19:30 PST	49.8[A]	118[A]	280[A]	310[A]	340[A]	367[A]	349[A]	342[A]	338[A]	360[A]	369[A]	344[A]	362[A]	239[A]	241[A]	360[A]	372[A]	57.9[A]	9.62[A]
19:45 PST	46.8[A]	118[A]	274[A]	292[A]	344[A]	353[A]	340[A]	344[A]	360[A]	358[A]	365[A]	376[A]	369[A]	239[A]	230[A]	344[A]	360[A]	51.4[A]	8.19[A]
20:00 PST	49.8[A]	129[A]	270[A]	286[A]	312[A]	344[A]	362[A]	320[A]	355[A]	360[A]	367[A]	367[A]	379[A]	227[A]	241[A]	379[A]	358[A]	50.6[A]	8.19[A]
20:15 PST	49.8[A]	128[A]	274[A]	296[A]	344[A]	362[A]	355[A]	360[A]	349[A]	351[A]	383[A]	355[A]	367[A]	227[A]	218[A]	369[A]	372[A]	45.3[A]	8.19[A]
20:30 PST	51.4[A]	125[A]	272[A]	294[A]	342[A]	353[A]	338[A]	335[A]	340[A]	358[A]	369[A]	344[A]	386[A]	237[A]	227[A]	358[A]	342[A]	44.6[A]	8.19[A]
20:45 PST	51.4[A]	125[A]	274[A]	290[A]	360[A]	338[A]	342[A]	342[A]	360[A]	349[A]	362[A]	374[A]	390[A]	235[A]	222[A]	362[A]	358[A]	41.8[A]	8.19[A]
21:00 PST	50.6[A]	132[A]	276[A]	274[A]	362[A]	351[A]	349[A]	349[A]	365[A]	351[A]	355[A]	365[A]	381[A]	252[A]	225[A]	367[A]	353[A]	41.1[A]	8.19[A]
21:15 PST	50.6[A]	128[A]	280[A]	292[A]	340[A]	325[A]	346[A]	353[A]	344[A]	362[A]	349[A]	358[A]	381[A]	241[A]	228[A]	362[A]	369[A]	39.0[A]	8.19[A]
21:30 PST	51.4[A]	125[A]	278[A]	292[A]	362[A]	355[A]	358[A]	338[A]	362[A]	367[A]	367[A]	374[A]	362[A]	230[A]	234[A]	372[A]	372[A]	37.7[A]	7.86[A]
21:45 PST	54.6[A]	123[A]	282[A]	288[A]	358[A]	353[A]	331[A]	362[A]	372[A]	351[A]	349[A]	386[A]	388[A]	239[A]	230[A]	329[A]	362[A]	34.5[A]	8.19[A]
22:00 PST	49.8[A]	129[A]	284[A]	338[A]	340[A]	346[A]	344[A]	342[A]	349[A]	342[A]	351[A]	360[A]	372[A]	228[A]	239[A]	388[A]	358[A]	33.9[A]	8.19[A]
22:15 PST	50.6[A]	130[A]	288[A]	331[A]	349[A]	351[A]	358[A]	362[A]	365[A]	369[A]	383[A]	360[A]	338[A]	239[A]	239[A]	351[A]	349[A]	33.3[A]	6.92[A]
22:30 PST	48.3[A]	128[A]	280[A]	318[A]	367[A]	360[A]	335[A]	346[A]	351[A]	355[A]	369[A]	360[A]	379[A]	230[A]	237[A]	369[A]	367[A]	32.7[A]	8.19[A]
22:45 PST	51.4[A]	121[A]	292[A]	335[A]	351[A]	367[A]	346[A]	365[A]	360[A]	374[A]	358[A]	383[A]	381[A]	223[A]	228[A]	338[A]	360[A]	30.4[A]	7.86[A]

TIME	Jan 24	Jan 25	Jan 26	Jan 27	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5	Feb 6	Feb 7	Feb 8	Feb 9	Feb 10	Feb 11
23:00 PST	48.3[A]	121[A]	278[A]	353[A]	353[A]	353[A]	346[A]	338[A]	349[A]	338[A]	379[A]	365[A]	381[A]	227[A]	237[A]	372[A]	353[A]	29.8[A]	8.19[A]
23:15 PST	46.8[A]	124[A]	282[A]	358[A]	360[A]	338[A]	320[A]	340[A]	349[A]	349[A]	367[A]	390[A]	367[A]	241[A]	218[A]	372[A]	351[A]	30.4[A]	8.19[A]
23:30 PST	51.4[A]	132[A]	272[A]	335[A]	353[A]	335[A]	344[A]	351[A]	342[A]	367[A]	367[A]	374[A]	374[A]	225[A]	232[A]	365[A]	376[A]	29.2[A]	7.86[A]
23:45 PST	50.6[A]	121[A]	270[A]	362[A]	342[A]	329[A]	342[A]	353[A]	355[A]	360[A]	369[A]	367[A]	351[A]	225[A]	230[A]	353[A]	372[A]	28.5[A]	7.86[A]
COUNT	**96**	**92**	**96**	**95**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**
MAX	**54.6**	**145**	**292**	**362**	**376**	**369**	**383**	**374**	**381**	**374**	**386**	**390**	**390**	**400**	**246**	**388**	**381**	**379**	**26.7**
MIN	**10.6**	**43.9**	**110**	**248**	**312**	**298**	**320**	**304**	**318**	**316**	**320**	**314**	**333**	**223**	**210**	**208**	**314**	**28.5**	**6.92**

Explanation

A	Approved for publication -- Processing and review completed.

2013

Discharge, cubic feet per second

TIME	Jan 18	Jan 19	Jan 20	Jan 21	Jan 22	Jan 23	Jan 24	Jan 25	Jan 26	Jan 27	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5
00:00 PST	0.00[A]	11.7[A]	134[A]	284[A]	290[A]	261[A]	302[A]	286[A]	170[A]	162[A]	185[A]	300[A]	314[A]	306[A]	304[A]	302[A]	257[A]	280[A]	288[A]
00:15 PST	0.00[A]	15.5[A]	121[A]	272[A]	290[A]	234[A]	296[A]	310[A]	174[A]	168[A]	173[A]	308[A]	316[A]	292[A]	304[A]	312[A]	284[A]	292[A]	263[A]
00:30 PST	0.00[A]	17.7[A]	138[A]	274[A]	278[A]	267[A]	300[A]	318[A]	187[A]	174[A]	182[A]	306[A]	308[A]	312[A]	276[A]	257[A]	276[A]	282[A]	292[A]
00:45 PST	0.00[A]	20.6[A]	144[A]	227[A]	294[A]	261[A]	312[A]	308[A]	177[A]	185[A]	190[A]	316[A]	312[A]	308[A]	306[A]	288[A]	272[A]	288[A]	288[A]
01:00 PST	0.00[A]	20.6[A]	137[A]	272[A]	304[A]	288[A]	284[A]	302[A]	189[A]	184[A]	173[A]	310[A]	306[A]	304[A]	310[A]	308[A]	282[A]	286[A]	292[A]
01:15 PST	0.00[A]	22.7[A]	138[A]	270[A]	280[A]	284[A]	310[A]	310[A]	190[A]	176[A]	185[A]	325[A]	316[A]	310[A]	298[A]	304[A]	282[A]	284[A]	253[A]
01:30 PST	0.00[A]	24.9[A]	142[A]	263[A]	288[A]	288[A]	320[A]	300[A]	182[A]	189[A]	181[A]	312[A]	282[A]	306[A]	280[A]	282[A]	296[A]	294[A]	280[A]
01:45 PST	0.00[A]	27.3[A]	146[A]	268[A]	278[A]	268[A]	308[A]	320[A]	198[A]	173[A]	187[A]	316[A]	312[A]	296[A]	296[A]	290[A]	302[A]	288[A]	268[A]
02:00 PST	0.00[A]	27.9[A]	136[A]	244[A]	286[A]	294[A]	302[A]	312[A]	168[A]	189[A]	177[A]	312[A]	320[A]	292[A]	306[A]	284[A]	286[A]	272[A]	270[A]
02:15 PST	0.00[A]	30.9[A]	140[A]	272[A]	276[A]	292[A]	308[A]	312[A]	185[A]	161[A]	176[A]	310[A]	298[A]	316[A]	302[A]	272[A]	296[A]	276[A]	292[A]
02:30 PST	0.00[A]	30.9[A]	136[A]	268[A]	312[A]	302[A]	308[A]	296[A]	187[A]	171[A]	171[A]	320[A]	314[A]	302[A]	288[A]	267[A]	298[A]	288[A]	270[A]
02:45 PST	0.00[A]	30.4[A]	153[A]	259[A]	286[A]	296[A]	300[A]	302[A]	182[A]	179[A]	185[A]	308[A]	290[A]	294[A]	286[A]	278[A]	284[A]	288[A]	278[A]
03:00 PST	0.00[A]	32.7[A]	141[A]	267[A]	282[A]	276[A]	310[A]	280[A]	170[A]	177[A]	181[A]	320[A]	310[A]	286[A]	300[A]	284[A]	290[A]	286[A]	270[A]
03:15 PST	0.00[A]	33.9[A]	146[A]	270[A]	288[A]	286[A]	300[A]	304[A]	168[A]	179[A]	176[A]	312[A]	298[A]	292[A]	304[A]	298[A]	296[A]	282[A]	284[A]
03:30 PST	0.00[A]	33.3[A]	140[A]	286[A]	296[A]	261[A]	312[A]	335[A]	190[A]	167[A]	168[A]	316[A]	296[A]	314[A]	290[A]	310[A]	292[A]	290[A]	272[A]
03:45 PST	0.00[A]	35.8[A]	138[A]	290[A]	296[A]	268[A]	300[A]	318[A]	185[A]	187[A]	197[A]	316[A]	302[A]	312[A]	284[A]	296[A]	290[A]	296[A]	278[A]
04:00 PST	0.00[A]	36.4[A]	146[A]	274[A]	306[A]	292[A]	306[A]	325[A]	181[A]	161[A]	179[A]	286[A]	294[A]	304[A]	290[A]	261[A]	282[A]	276[A]	288[A]
04:15 PST	0.00[A]	35.8[A]	151[A]	272[A]	286[A]	265[A]	312[A]	310[A]	195[A]	164[A]	182[A]	308[A]	294[A]	304[A]	306[A]	296[A]	280[A]	292[A]	276[A]
04:30 PST	0.00[A]	36.4[A]	146[A]	284[A]	290[A]	286[A]	308[A]	288[A]	164[A]	173[A]	189[A]	280[A]	300[A]	292[A]	298[A]	296[A]	300[A]	282[A]	294[A]
04:45 PST	0.00[A]	34.5[A]	146[A]	257[A]	282[A]	298[A]	312[A]	329[A]	182[A]	176[A]	184[A]	312[A]	308[A]	300[A]	257[A]	298[A]	292[A]	278[A]	296[A]
05:00 PST	0.00[A]	38.4[A]	149[A]	284[A]	304[A]	261[A]	312[A]	306[A]	187[A]	170[A]	197[A]	310[A]	290[A]	290[A]	302[A]	298[A]	286[A]	288[A]	255[A]
05:15 PST	0.00[A]	39.0[A]	146[A]	268[A]	286[A]	300[A]	304[A]	292[A]	179[A]	176[A]	185[A]	314[A]	306[A]	310[A]	278[A]	288[A]	282[A]	274[A]	274[A]
05:30 PST	0.00[A]	36.4[A]	125[A]	288[A]	302[A]	274[A]	290[A]	300[A]	168[A]	181[A]	189[A]	308[A]	298[A]	312[A]	294[A]	288[A]	288[A]	243[A]	274[A]
05:45 PST	0.00[A]	37.1[A]	151[A]	270[A]	296[A]	280[A]	308[A]	308[A]	184[A]	176[A]	179[A]	304[A]	310[A]	327[A]	288[A]	290[A]	298[A]	298[A]	270[A]
06:00 PST	0.00[A]	37.7[A]	148[A]	296[A]	302[A]	284[A]	314[A]	312[A]	168[A]	176[A]	177[A]	304[A]	320[A]	304[A]	298[A]	280[A]	300[A]	284[A]	286[A]
06:15 PST	0.00[A]	37.1[A]	151[A]	270[A]	306[A]	298[A]	304[A]	304[A]	177[A]	185[A]	185[A]	282[A]	294[A]	316[A]	282[A]	292[A]	259[A]	259[A]	274[A]
06:30 PST	0.00[A]	38.4[A]	153[A]	288[A]	302[A]	288[A]	314[A]	327[A]	165[A]	173[A]	179[A]	304[A]	292[A]	310[A]	280[A]	306[A]	302[A]	272[A]	282[A]
06:45 PST	0.00[A]	38.4[A]	144[A]	255[A]	304[A]	274[A]	294[A]	276[A]	184[A]	182[A]	184[A]	314[A]	292[A]	282[A]	290[A]	278[A]	284[A]	292[A]	248[A]
07:00 PST	0.00[A]	41.1[A]	152[A]	282[A]	306[A]	288[A]	306[A]	329[A]	156[A]	167[A]	179[A]	308[A]	316[A]	294[A]	298[A]	298[A]	272[A]	290[A]	276[A]
07:15 PST	0.00[A]	39.7[A]	149[A]	290[A]	290[A]	280[A]	323[A]	304[A]	173[A]	187[A]	182[A]	284[A]	318[A]	306[A]	298[A]	306[A]	290[A]	292[A]	284[A]

TIME	Jan 18	Jan 19	Jan 20	Jan 21	Jan 22	Jan 23	Jan 24	Jan 25	Jan 26	Jan 27	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5
07:30 PST	0.00[A]	39.7[A]	153[A]	302[A]	282[A]	294[A]	302[A]	320[A]	192[A]	179[A]	181[A]	306[A]	310[A]	294[A]	300[A]	300[A]	296[A]	255[A]	286[A]
07:45 PST	0.00[A]	39.0[A]	146[A]	259[A]	292[A]	263[A]	278[A]	308[A]	174[A]	173[A]	177[A]	310[A]	318[A]	314[A]	310[A]	290[A]	304[A]	268[A]	274[A]
08:00 PST	0.00[A]	40.4[A]	152[A]	276[A]	282[A]	296[A]	298[A]	288[A]	189[A]	168[A]	170[A]	306[A]	318[A]	304[A]	300[A]	304[A]	290[A]	286[A]	290[A]
08:15 PST	0.00[A]	41.1[A]	149[A]	263[A]	310[A]	296[A]	304[A]	314[A]	177[A]	185[A]	174[A]	306[A]	280[A]	288[A]	294[A]	286[A]	268[A]	290[A]	259[A]
08:30 PST	0.00[A]	43.2[A]	140[A]	274[A]	306[A]	296[A]	304[A]	308[A]	173[A]	184[A]	177[A]	290[A]	300[A]	312[A]	312[A]	308[A]	261[A]	286[A]	282[A]
08:45 PST	0.00[A]	42.5[A]	156[A]	284[A]	292[A]	294[A]	296[A]	344[A]	165[A]	165[A]	164[A]	304[A]	318[A]	308[A]	284[A]	270[A]	278[A]	284[A]	265[A]
09:00 PST	0.00[A]	41.8[A]	151[A]	292[A]	298[A]	300[A]	312[A]	304[A]	170[A]	185[A]	190[A]	300[A]	312[A]	304[A]	292[A]	274[A]	294[A]	288[A]	272[A]
09:15 PST	0.00[A]	41.8[A]	151[A]	290[A]	304[A]	282[A]	306[A]	276[A]	168[A]	177[A]	174[A]	312[A]	294[A]	308[A]	306[A]	302[A]	280[A]	284[A]	284[A]
09:30 PST	0.00[A]	42.5[A]	153[A]	280[A]	290[A]	294[A]	312[A]	329[A]	174[A]	173[A]	189[A]	310[A]	320[A]	312[A]	292[A]	292[A]	284[A]	284[A]	278[A]
09:45 PST	0.00[A]	42.5[A]	144[A]	308[A]	294[A]	300[A]	304[A]	314[A]	174[A]	173[A]	161[A]	304[A]	306[A]	292[A]	292[A]	276[A]	292[A]	288[A]	280[A]
10:00 PST	0.00[A]	41.8[A]	146[A]	270[A]	286[A]	296[A]	304[A]	306[A]	176[A]	195[A]	185[A]	306[A]	298[A]	298[A]	290[A]	280[A]	292[A]	276[A]	272[A]
10:15 PST	0.00[A]	43.2[A]	155[A]	265[A]	296[A]	302[A]	296[A]	314[A]	182[A]	176[A]	185[A]	314[A]	288[A]	316[A]	292[A]	304[A]	292[A]	261[A]	263[A]
10:30 PST	0.00[A]	41.1[A]	142[A]	255[A]	308[A]	286[A]	304[A]	312[A]	179[A]	174[A]	184[A]	288[A]	292[A]	294[A]	308[A]	294[A]	286[A]	282[A]	265[A]
10:45 PST	0.00[A]	44.6[A]	149[A]	298[A]	306[A]	259[A]	300[A]	306[A]	168[A]	185[A]	182[A]	320[A]	286[A]	302[A]	288[A]	304[A]	278[A]	292[A]	211[A]
11:00 PST	0.00[A]	43.2[A]	151[A]	268[A]	296[A]	302[A]	329[A]	308[A]	184[A]	181[A]	167[A]	308[A]	318[A]	310[A]	296[A]	294[A]	286[A]	274[A]	142[A]
11:15 PST	0.00[A]	42.5[A]	151[A]	278[A]	284[A]	284[A]	298[A]	296[A]	159[A]	182[A]	193[A]	296[A]	300[A]	316[A]	304[A]	261[A]	286[A]	288[A]	113[A]
11:30 PST	0.00[A]	43.2[A]	145[A]	288[A]	304[A]	302[A]	304[A]	268[A]	174[A]	173[A]	193[A]	308[A]	304[A]	300[A]	296[A]	296[A]	306[A]	284[A]	88.7[A]
11:45 PST	0.00[A]	42.5[A]	153[A]	284[A]	320[A]	284[A]	290[A]	218[A]	156[A]	167[A]	205[A]	302[A]	323[A]	302[A]	294[A]	298[A]	286[A]	265[A]	79.3[A]
12:00 PST	0.00[A]	42.5[A]	158[A]	278[A]	300[A]	288[A]	312[A]	202[A]	189[A]	189[A]	222[A]	304[A]	286[A]	302[A]	294[A]	282[A]	294[A]	284[A]	65.8[A]
12:15 PST	0.00[A]	49.8[A]	161[A]	288[A]	235[A]	274[A]	312[A]	192[A]	190[A]	185[A]	235[A]	316[A]	308[A]	312[A]	308[A]	286[A]	302[A]	276[A]	59.6[A]
12:30 PST	0.00[A]	60.5[A]	206[A]	282[A]	292[A]	276[A]	294[A]	181[A]	176[A]	184[A]	261[A]	304[A]	306[A]	294[A]	274[A]	284[A]	304[A]	276[A]	56.2[A]
12:45 PST	0.00[A]	74.3[A]	216[A]	274[A]	304[A]	294[A]	294[A]	185[A]	177[A]	185[A]	290[A]	310[A]	288[A]	306[A]	278[A]	300[A]	294[A]	278[A]	51.4[A]
13:00 PST	0.00[A]	83.4[A]	228[A]	296[A]	284[A]	292[A]	312[A]	162[A]	177[A]	181[A]	294[A]	292[A]	300[A]	316[A]	300[A]	292[A]	296[A]	282[A]	48.3[A]
13:15 PST	0.00[A]	93.1[A]	239[A]	288[A]	270[A]	292[A]	318[A]	181[A]	177[A]	179[A]	306[A]	316[A]	302[A]	306[A]	306[A]	292[A]	294[A]	282[A]	41.8[A]
13:30 PST	0.00[A]	106[A]	259[A]	270[A]	294[A]	280[A]	314[A]	181[A]	176[A]	189[A]	310[A]	318[A]	294[A]	302[A]	278[A]	292[A]	298[A]	288[A]	41.8[A]
13:45 PST	0.00[A]	101[A]	250[A]	274[A]	280[A]	296[A]	316[A]	176[A]	187[A]	181[A]	316[A]	306[A]	320[A]	290[A]	294[A]	298[A]	282[A]	280[A]	39.0[A]
14:00 PST	0.00[A]	108[A]	263[A]	290[A]	290[A]	298[A]	302[A]	176[A]	173[A]	173[A]	298[A]	310[A]	312[A]	304[A]	288[A]	286[A]	298[A]	280[A]	37.1[A]
14:15 PST	0.00[A]	121[A]	244[A]	294[A]	278[A]	282[A]	323[A]	179[A]	164[A]	173[A]	310[A]	308[A]	304[A]	292[A]	282[A]	296[A]	292[A]	286[A]	36.4[A]
14:30 PST	0.00[A]	120[A]	255[A]	294[A]	298[A]	302[A]	308[A]	187[A]	162[A]	179[A]	298[A]	274[A]	300[A]	278[A]	302[A]	300[A]	274[A]	276[A]	33.9[A]
14:45 PST	0.00[A]	121[A]	257[A]	286[A]	288[A]	298[A]	314[A]	187[A]	173[A]	176[A]	320[A]	296[A]	314[A]	286[A]	290[A]	296[A]	261[A]	298[A]	31.5[A]
15:00 PST	0.00[A]	125[A]	250[A]	296[A]	298[A]	302[A]	327[A]	195[A]	165[A]	173[A]	300[A]	314[A]	265[A]	296[A]	308[A]	290[A]	288[A]	300[A]	30.4[A]

TIME	Jan 18	Jan 19	Jan 20	Jan 21	Jan 22	Jan 23	Jan 24	Jan 25	Jan 26	Jan 27	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5
15:15 PST	0.00[A]	128[A]	253[A]	302[A]	304[A]	298[A]	306[A]	190[A]	162[A]	176[A]	288[A]	312[A]	300[A]	308[A]	300[A]	292[A]	280[A]	292[A]	29.8[A]
15:30 PST	0.00[A]	130[A]	270[A]	298[A]	265[A]	298[A]	294[A]	177[A]	197[A]	189[A]	316[A]	302[A]	306[A]	284[A]	296[A]	276[A]	300[A]	294[A]	29.8[A]
15:45 PST	0.00[A]	129[A]	265[A]	294[A]	296[A]	306[A]	308[A]	176[A]	182[A]	179[A]	296[A]	304[A]	300[A]	298[A]	298[A]	296[A]	263[A]	265[A]	26.1[A]
16:00 PST	0.00[A]	130[A]	257[A]	272[A]	292[A]	296[A]	325[A]	185[A]	174[A]	167[A]	314[A]	288[A]	290[A]	296[A]	296[A]	308[A]	294[A]	282[A]	26.1[A]
16:15 PST	0.00[A]	133[A]	270[A]	296[A]	290[A]	292[A]	323[A]	189[A]	174[A]	174[A]	316[A]	290[A]	308[A]	296[A]	306[A]	306[A]	288[A]	274[A]	25.5[A]
16:30 PST	0.00[A]	138[A]	255[A]	286[A]	290[A]	300[A]	329[A]	185[A]	152[A]	179[A]	300[A]	318[A]	310[A]	290[A]	304[A]	310[A]	278[A]	263[A]	24.4[A]
16:45 PST	0.00[A]	138[A]	267[A]	284[A]	298[A]	302[A]	316[A]	182[A]	176[A]	182[A]	312[A]	300[A]	304[A]	306[A]	318[A]	304[A]	292[A]	263[A]	23.3[A]
17:00 PST	0.00[A]	137[A]	274[A]	288[A]	304[A]	306[A]	310[A]	177[A]	173[A]	165[A]	312[A]	298[A]	306[A]	304[A]	284[A]	300[A]	286[A]	286[A]	22.7[A]
17:15 PST	0.00[A]	136[A]	272[A]	294[A]	304[A]	304[A]	312[A]	184[A]	187[A]	182[A]	308[A]	300[A]	284[A]	284[A]	312[A]	308[A]	248[A]	286[A]	21.7[A]
17:30 PST	0.00[A]	138[A]	276[A]	274[A]	292[A]	253[A]	306[A]	187[A]	190[A]	182[A]	312[A]	308[A]	300[A]	302[A]	282[A]	274[A]	265[A]	286[A]	21.1[A]
17:45 PST	0.00[A]	137[A]	259[A]	286[A]	288[A]	312[A]	312[A]	159[A]	177[A]	174[A]	316[A]	302[A]	296[A]	294[A]	302[A]	282[A]	282[A]	294[A]	21.1[A]
18:00 PST	0.00[A]	141[A]	268[A]	280[A]	282[A]	298[A]	308[A]	185[A]	167[A]	195[A]	302[A]	320[A]	306[A]	320[A]	302[A]	288[A]	272[A]	288[A]	20.1[A]
18:15 PST	0.00[A]	124[A]	272[A]	265[A]	298[A]	302[A]	300[A]	185[A]	176[A]	179[A]	320[A]	298[A]	316[A]	294[A]	306[A]	284[A]	284[A]	284[A]	20.1[A]
18:30 PST	0.00[A]	134[A]	265[A]	280[A]	294[A]	265[A]	302[A]	173[A]	187[A]	171[A]	314[A]	310[A]	320[A]	302[A]	263[A]	296[A]	261[A]	268[A]	20.1[A]
18:45 PST	0.00[A]	141[A]	257[A]	270[A]	310[A]	312[A]	310[A]	184[A]	179[A]	165[A]	306[A]	312[A]	292[A]	310[A]	282[A]	292[A]	292[A]	294[A]	19.2[A]
19:00 PST	0.00[A]	133[A]	265[A]	304[A]	298[A]	296[A]	331[A]	173[A]	187[A]	182[A]	327[A]	308[A]	280[A]	298[A]	272[A]	286[A]	296[A]	288[A]	18.7[A]
19:15 PST	0.00[A]	140[A]	267[A]	274[A]	288[A]	282[A]	316[A]	173[A]	171[A]	173[A]	306[A]	306[A]	304[A]	294[A]	302[A]	298[A]	274[A]	290[A]	18.7[A]
19:30 PST	0.00[A]	137[A]	268[A]	280[A]	292[A]	312[A]	318[A]	165[A]	181[A]	164[A]	314[A]	294[A]	296[A]	310[A]	282[A]	300[A]	282[A]	278[A]	18.2[A]
19:45 PST	0.00[A]	140[A]	246[A]	296[A]	270[A]	306[A]	292[A]	184[A]	177[A]	174[A]	296[A]	312[A]	294[A]	298[A]	292[A]	304[A]	296[A]	276[A]	17.3[A]
20:00 PST	0.00[A]	132[A]	250[A]	296[A]	253[A]	312[A]	312[A]	162[A]	176[A]	187[A]	298[A]	312[A]	312[A]	306[A]	312[A]	284[A]	284[A]	288[A]	17.3[A]
20:15 PST	0.00[A]	142[A]	252[A]	290[A]	253[A]	298[A]	302[A]	185[A]	170[A]	187[A]	296[A]	304[A]	310[A]	312[A]	294[A]	268[A]	274[A]	288[A]	16.0[A]
20:30 PST	0.00[A]	129[A]	272[A]	270[A]	244[A]	308[A]	308[A]	170[A]	174[A]	174[A]	323[A]	306[A]	306[A]	288[A]	302[A]	290[A]	263[A]	284[A]	16.4[A]
20:45 PST	0.00[A]	129[A]	250[A]	294[A]	215[A]	310[A]	308[A]	182[A]	174[A]	176[A]	274[A]	316[A]	300[A]	304[A]	298[A]	296[A]	248[A]	286[A]	16.0[A]
21:00 PST	0.00[A]	142[A]	268[A]	302[A]	235[A]	308[A]	316[A]	181[A]	184[A]	187[A]	312[A]	314[A]	314[A]	300[A]	292[A]	288[A]	276[A]	286[A]	16.0[A]
21:15 PST	0.00[A]	138[A]	263[A]	280[A]	272[A]	304[A]	306[A]	181[A]	168[A]	162[A]	314[A]	290[A]	304[A]	304[A]	294[A]	288[A]	282[A]	272[A]	15.1[A]
21:30 PST	0.00[A]	141[A]	257[A]	302[A]	276[A]	325[A]	282[A]	173[A]	190[A]	177[A]	296[A]	302[A]	308[A]	294[A]	308[A]	282[A]	292[A]	268[A]	15.1[A]
21:45 PST	0.00[A]	145[A]	259[A]	270[A]	282[A]	300[A]	314[A]	192[A]	176[A]	176[A]	300[A]	302[A]	302[A]	314[A]	282[A]	257[A]	306[A]	274[A]	15.5[A]
22:00 PST	0.00[A]	133[A]	270[A]	286[A]	278[A]	318[A]	308[A]	158[A]	168[A]	190[A]	296[A]	314[A]	310[A]	306[A]	302[A]	284[A]	282[A]	286[A]	15.1[A]
22:15 PST	0.00[A]	136[A]	272[A]	286[A]	259[A]	292[A]	312[A]	156[A]	185[A]	185[A]	310[A]	304[A]	298[A]	310[A]	290[A]	288[A]	278[A]	268[A]	14.3[A]
22:30 PST	0.00[A]	146[A]	257[A]	288[A]	230[A]	318[A]	325[A]	164[A]	162[A]	184[A]	312[A]	300[A]	306[A]	294[A]	298[A]	288[A]	294[A]	282[A]	13.5[A]
22:45 PST	0.00[A]	144[A]	272[A]	300[A]	222[A]	300[A]	318[A]	184[A]	182[A]	176[A]	325[A]	308[A]	298[A]	284[A]	306[A]	298[A]	284[A]	278[A]	14.3[A]

TIME	Jan 18	Jan 19	Jan 20	Jan 21	Jan 22	Jan 23	Jan 24	Jan 25	Jan 26	Jan 27	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5
23:00 PST	0.00[A]	140[A]	284[A]	265[A]	232[A]	288[A]	304[A]	167[A]	167[A]	187[A]	304[A]	318[A]	312[A]	288[A]	286[A]	296[A]	284[A]	276[A]	12.8[A]
23:15 PST	0.00[A]	144[A]	286[A]	292[A]	276[A]	298[A]	314[A]	198[A]	184[A]	181[A]	325[A]	306[A]	310[A]	263[A]	296[A]	268[A]	288[A]	278[A]	13.5[A]
23:30 PST	0.00[A]	141[A]	280[A]	282[A]	246[A]	314[A]	306[A]	179[A]	179[A]	192[A]	314[A]	316[A]	300[A]	290[A]	298[A]	272[A]	268[A]	280[A]	13.1[A]
23:45 PST	7.86[A]	144[A]	282[A]	300[A]	259[A]	306[A]	304[A]	176[A]	170[A]	179[A]	294[A]	316[A]	300[A]	308[A]	288[A]	288[A]	282[A]	278[A]	12.8[A]
COUNT	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96
MAX	7.86	146	286	308	320	325	331	344	198	195	327	325	323	327	318	312	306	300	296
MIN	0.00	11.7	121	227	215	234	278	156	152	161	161	274	265	263	257	257	248	243	12.8

Explanation

A	Approved for publication -- Processing and review completed.

2017

Discharge, cubic feet per second

TIME	Feb 28	Mar 1	Mar 2	Mar 3	Mar 4	Mar 5	Mar 6	Mar 7	Mar 8	Mar 9	Mar 10	Mar 11	Mar 12	Mar 13	Mar 14	Mar 15	Mar 16	Mar 17	Mar 18	Mar 19
00:00 PDT														342[A]	302[A]	324[A]	39.2[A]	12.5[A]	8.50[A]	6.32[A]
00:00 PST	388[A]	209[A]	340[A]	327[A]	325[A]	340[A]	287[A]	344[A]	336[A]	314[A]	338[A]	296[A]	340[A]							
00:15 PDT														334[A]	314[A]	327[A]	38.4[A]	12.5[A]	8.50[A]	6.32[A]
00:15 PST	456[A]	219[A]	375[A]	331[A]	327[A]	298[A]	344[A]	360[A]	325[A]	325[A]	314[A]	310[A]	331[A]							
00:30 PDT														336[A]	320[A]	320[A]	37.6[A]	12.9[A]	8.90[A]	6.32[A]
00:30 PST	463[A]	190[A]	346[A]	362[A]	329[A]	322[A]	310[A]	352[A]	329[A]	327[A]	336[A]	325[A]	331[A]							
00:45 PDT														344[A]	302[A]	316[A]	36.9[A]	12.5[A]	8.90[A]	7.00[A]
00:45 PST	521[A]	207[A]	364[A]	329[A]	356[A]	340[A]	342[A]	346[A]	329[A]	329[A]	331[A]	327[A]	336[A]							
01:00 PDT														334[A]	308[A]	327[A]	36.1[A]	12.5[A]	8.11[A]	6.66[A]
01:00 PST	484[A]	201[A]	358[A]	362[A]	338[A]	327[A]	289[A]	325[A]	331[A]	318[A]	322[A]	318[A]	338[A]							
01:15 PDT														334[A]	308[A]	329[A]	33.9[A]	12.5[A]	8.11[A]	6.66[A]
01:15 PST	482[A]	204[A]	331[A]	322[A]	348[A]	334[A]	348[A]	334[A]	318[A]	340[A]	327[A]	310[A]	346[A]							
01:30 PDT														336[A]	308[A]	320[A]	35.4[A]	12.1[A]	8.90[A]	6.32[A]
01:30 PST	519[A]	186[A]	350[A]	329[A]	338[A]	320[A]	344[A]	329[A]	314[A]	316[A]	320[A]	329[A]	334[A]							
01:45 PDT														331[A]	283[A]	322[A]	34.6[A]	12.1[A]	8.11[A]	6.32[A]
01:45 PST	501[A]	198[A]	364[A]	342[A]	336[A]	318[A]	294[A]	348[A]	306[A]	324[A]	325[A]	322[A]	340[A]							
02:00 PDT														340[A]	296[A]	327[A]	31.8[A]	12.1[A]	8.50[A]	6.66[A]
02:00 PST	562[A]	189[A]	329[A]	336[A]	334[A]	316[A]	310[A]	318[A]	329[A]	314[A]	310[A]	312[A]								
02:15 PDT														327[A]	316[A]	336[A]	32.5[A]	12.1[A]	8.90[A]	6.32[A]
02:15 PST	506[A]	199[A]	358[A]	325[A]	322[A]	325[A]	324[A]	344[A]	334[A]	320[A]	334[A]	312[A]								
02:30 PDT														334[A]	310[A]	320[A]	31.8[A]	12.5[A]	8.11[A]	6.32[A]
02:30 PST	484[A]	177[A]	344[A]	369[A]	324[A]	318[A]	312[A]	314[A]	342[A]	304[A]	312[A]	318[A]								
02:45 PDT														325[A]	294[A]	331[A]	30.4[A]	12.5[A]	8.50[A]	6.66[A]
02:45 PST	575[A]	183[A]	336[A]	302[A]	308[A]	316[A]	316[A]	318[A]	342[A]	302[A]	334[A]	320[A]								
03:00 PDT													340[A]	336[A]	312[A]	331[A]	30.4[A]	12.5[A]	7.73[A]	6.66[A]
03:00 PST	562[A]	193[A]	375[A]	325[A]	316[A]	322[A]	312[A]	318[A]	320[A]	331[A]	338[A]	316[A]								
03:15 PDT													338[A]	325[A]	316[A]	325[A]	29.1[A]	12.5[A]	8.11[A]	6.32[A]
03:15 PST	570[A]	195[A]	381[A]	302[A]	322[A]	344[A]	308[A]	336[A]	331[A]	340[A]	331[A]	308[A]								
03:30 PDT													325[A]	325[A]	314[A]	331[A]	29.1[A]	11.7[A]	8.11[A]	6.66[A]
03:30 PST	591[A]	207[A]	316[A]	364[A]	331[A]	318[A]	294[A]	346[A]	329[A]	334[A]	322[A]	324[A]								

TIME	Feb 28	Mar 1	Mar 2	Mar 3	Mar 4	Mar 5	Mar 6	Mar 7	Mar 8	Mar 9	Mar 10	Mar 11	Mar 12	Mar 13	Mar 14	Mar 15	Mar 16	Mar 17	Mar 18	Mar 19
03:45 PDT													338[A]	331[A]	306[A]	331[A]	28.4[A]	11.7[A]	8.50[A]	6.32[A]
03:45 PST	534[A]	206[A]	342[A]	308[A]	320[A]	318[A]	320[A]	350[A]	324[A]	327[A]	329[A]	308[A]								
04:00 PDT													342[A]	324[A]	318[A]	329[A]	27.2[A]	11.7[A]	8.50[A]	6.00[A]
04:00 PST	463[A]	212[A]	342[A]	327[A]	331[A]	324[A]	308[A]	338[A]	334[A]	329[A]	324[A]	322[A]								
04:15 PDT													340[A]	329[A]	289[A]	340[A]	27.2[A]	11.7[A]	8.50[A]	6.00[A]
04:15 PST	526[A]	210[A]	352[A]	348[A]	304[A]	327[A]	281[A]	308[A]	331[A]	316[A]	308[A]	318[A]								
04:30 PDT													340[A]	342[A]	289[A]	325[A]	25.3[A]	11.3[A]	8.50[A]	6.32[A]
04:30 PST	487[A]	199[A]	342[A]	369[A]	338[A]	320[A]	310[A]	346[A]	318[A]	325[A]	331[A]	294[A]								
04:45 PDT													342[A]	325[A]	293[A]	336[A]	25.9[A]	12.1[A]	7.73[A]	6.32[A]
04:45 PST	460[A]	201[A]	320[A]	338[A]	314[A]	342[A]	320[A]	350[A]	356[A]	320[A]	324[A]	336[A]								
05:00 PDT													338[A]	334[A]	304[A]	331[A]	26.5[A]	12.1[A]	8.50[A]	6.66[A]
05:00 PST	451[A]	215[A]	324[A]	269[A]	279[A]	331[A]	312[A]	340[A]	331[A]	336[A]	320[A]	325[A]								
05:15 PDT													336[A]	325[A]	314[A]	336[A]	25.3[A]	11.3[A]	8.11[A]	6.66[A]
05:15 PST	423[A]	212[A]	371[A]	336[A]	320[A]	302[A]	316[A]	324[A]	322[A]	329[A]	320[A]	336[A]								
05:30 PDT													346[A]	327[A]	300[A]	327[A]	24.1[A]	11.7[A]	8.11[A]	6.32[A]
05:30 PST	369[A]	186[A]	348[A]	340[A]	274[A]	312[A]	281[A]	360[A]	325[A]	322[A]	331[A]	336[A]								
05:45 PDT													324[A]	324[A]	310[A]	324[A]	24.7[A]	12.1[A]	8.11[A]	6.00[A]
05:45 PST	399[A]	189[A]	358[A]	346[A]	324[A]	304[A]	310[A]	320[A]	310[A]	329[A]	336[A]	294[A]								
06:00 PDT													342[A]	334[A]	316[A]	338[A]	24.7[A]	11.3[A]	8.11[A]	6.32[A]
06:00 PST	360[A]	219[A]	352[A]	322[A]	279[A]	340[A]	314[A]	325[A]	324[A]	320[A]	331[A]	322[A]								
06:15 PDT													334[A]	327[A]	304[A]	336[A]	24.1[A]	12.1[A]	7.73[A]	6.66[A]
06:15 PST	285[A]	190[A]	346[A]	327[A]	296[A]	340[A]	310[A]	325[A]	314[A]	329[A]	312[A]	318[A]								
06:30 PDT													329[A]	338[A]	318[A]	327[A]	22.9[A]	12.1[A]	7.73[A]	6.00[A]
06:30 PST	316[A]	204[A]	352[A]	327[A]	294[A]	316[A]	300[A]	346[A]	348[A]	324[A]	316[A]	314[A]								
06:45 PDT													336[A]	334[A]	316[A]	327[A]	22.3[A]	11.3[A]	7.73[A]	6.32[A]
06:45 PST	331[A]	204[A]	352[A]	358[A]	352[A]	316[A]	316[A]	302[A]	352[A]	327[A]	324[A]	312[A]								
07:00 PDT													334[A]	318[A]	306[A]	324[A]	22.3[A]	11.3[A]	7.73[A]	6.32[A]
07:00 PST	298[A]	201[A]	342[A]	310[A]	302[A]	293[A]	287[A]	325[A]	344[A]	325[A]	338[A]	318[A]								
07:15 PDT													334[A]	334[A]	320[A]	327[A]	22.3[A]	11.7[A]	8.50[A]	6.00[A]
07:15 PST	314[A]	190[A]	336[A]	334[A]	312[A]	338[A]	312[A]	334[A]	325[A]	338[A]	327[A]	310[A]								
07:30 PDT													331[A]	336[A]	312[A]	344[A]	21.2[A]	11.3[A]	7.73[A]	6.00[A]

TIME	Feb 28	Mar 1	Mar 2	Mar 3	Mar 4	Mar 5	Mar 6	Mar 7	Mar 8	Mar 9	Mar 10	Mar 11	Mar 12	Mar 13	Mar 14	Mar 15	Mar 16	Mar 17	Mar 18	Mar 19
07:30 PST	279[A]	169[A]	362[A]	318[A]	312[A]	354[A]	310[A]	325[A]	325[A]	329[A]	325[A]	320[A]								
07:45 PDT													325[A]	329[A]	320[A]	338[A]	21.8[A]	11.7[A]	7.73[A]	6.00[A]
07:45 PST	256[A]	220[A]	340[A]	322[A]	308[A]	336[A]	306[A]	344[A]	340[A]	331[A]	327[A]	320[A]								
08:00 PDT													338[A]	336[A]	329[A]	342[A]	21.2[A]	11.3[A]	8.50[A]	6.00[A]
08:00 PST	235[A]	183[A]	375[A]	322[A]	300[A]	296[A]	287[A]	334[A]	354[A]	325[A]	314[A]	316[A]								
08:15 PDT													342[A]	336[A]	316[A]	327[A]	20.7[A]	10.9[A]	7.73[A]	6.32[A]
08:15 PST	239[A]	192[A]	352[A]	331[A]	310[A]	348[A]	338[A]	318[A]	336[A]	334[A]	346[A]	322[A]								
08:30 PDT													331[A]	325[A]	324[A]	325[A]	21.8[A]	11.3[A]	7.73[A]	6.00[A]
08:30 PST	223[A]	184[A]	340[A]	340[A]	327[A]	316[A]	320[A]	336[A]	346[A]	340[A]	316[A]	329[A]								
08:45 PDT													342[A]	331[A]	316[A]	344[A]	21.2[A]	10.9[A]	8.11[A]	6.00[A]
08:45 PST	210[A]	207[A]	342[A]	342[A]	324[A]	314[A]	310[A]	325[A]	348[A]	314[A]	314[A]	318[A]								
09:00 PDT													334[A]	334[A]	324[A]	336[A]	20.1[A]	11.7[A]	8.11[A]	6.00[A]
09:00 PST	206[A]	190[A]	334[A]	373[A]	294[A]	327[A]	300[A]	334[A]	348[A]	329[A]	325[A]	318[A]								
09:15 PDT													336[A]	340[A]	327[A]	322[A]	20.7[A]	11.7[A]	7.73[A]	6.66[A]
09:15 PST	189[A]	193[A]	310[A]	293[A]	291[A]	312[A]	318[A]	316[A]	329[A]	336[A]	327[A]	310[A]								
09:30 PDT													346[A]	327[A]	325[A]	322[A]	20.1[A]	11.7[A]	7.73[A]	6.32[A]
09:30 PST	204[A]	189[A]	322[A]	369[A]	329[A]	346[A]	304[A]	338[A]	334[A]	320[A]	320[A]	322[A]								
09:45 PDT													318[A]	331[A]	334[A]	329[A]	19.6[A]	11.7[A]	8.11[A]	6.66[A]
09:45 PST	186[A]	204[A]	342[A]	352[A]	331[A]	325[A]	327[A]	338[A]	358[A]	334[A]	308[A]	302[A]								
10:00 PDT													334[A]	334[A]	350[A]	329[A]	19.6[A]	10.9[A]	7.73[A]	6.00[A]
10:00 PST	189[A]	190[A]	356[A]	342[A]	324[A]	356[A]	296[A]	312[A]	334[A]	327[A]	314[A]	308[A]								
10:15 PDT													346[A]	320[A]	336[A]	327[A]	19.1[A]	11.3[A]	7.36[A]	6.00[A]
10:15 PST	164[A]	174[A]	346[A]	344[A]	338[A]	318[A]	314[A]	327[A]	331[A]	324[A]	331[A]	316[A]								
10:30 PDT													320[A]	340[A]	334[A]	324[A]	20.1[A]	11.3[A]	7.36[A]	6.00[A]
10:30 PST	166[A]	193[A]	324[A]	324[A]	310[A]	350[A]	310[A]	338[A]	336[A]	318[A]	304[A]	331[A]								
10:45 PDT													322[A]	334[A]	302[A]	324[A]	18.5[A]	10.9[A]	7.73[A]	6.00[A]
10:45 PST	166[A]	184[A]	356[A]	350[A]	314[A]	312[A]	310[A]	308[A]	338[A]	329[A]	334[A]	298[A]								
11:00 PDT													338[A]	327[A]	314[A]	318[A]	19.6[A]	10.9[A]	8.11[A]	6.66[A]
11:00 PST	162[A]	201[A]	371[A]	308[A]	329[A]	302[A]	310[A]	340[A]	325[A]	331[A]	324[A]	320[A]								
11:15 PDT													340[A]	327[A]	314[A]	331[A]	18.5[A]	10.9[A]	7.36[A]	6.32[A]
11:15 PST	152[A]	209[A]	352[A]	314[A]	324[A]	314[A]	318[A]	334[A]	327[A]	334[A]	310[A]	302[A]								

TIME	Feb 28	Mar 1	Mar 2	Mar 3	Mar 4	Mar 5	Mar 6	Mar 7	Mar 8	Mar 9	Mar 10	Mar 11	Mar 12	Mar 13	Mar 14	Mar 15	Mar 16	Mar 17	Mar 18	Mar 19
11:30 PDT													327[A]	334[A]	320[A]	325[A]	18.5[A]	11.3[A]	8.11[A]	6.00[A]
11:30 PST	135[A]	189[A]	358[A]	296[A]	308[A]	329[A]	316[A]	336[A]	348[A]	316[A]	314[A]	302[A]								
11:45 PDT													327[A]	334[A]	296[A]	318[A]	18.0[A]	11.3[A]	8.11[A]	6.66[A]
11:45 PST	139[A]	195[A]	334[A]	318[A]	312[A]	324[A]	318[A]	350[A]	346[A]	338[A]	314[A]	312[A]								
12:00 PDT													344[A]	322[A]	320[A]	338[A]	18.0[A]	10.6[A]	7.36[A]	6.00[A]
12:00 PST	130[A]	198[A]	308[A]	360[A]	320[A]	293[A]	320[A]	324[A]	340[A]	327[A]	312[A]	308[A]								
12:15 PDT													324[A]	324[A]	312[A]	336[A]	18.0[A]	10.6[A]	8.11[A]	6.00[A]
12:15 PST	134[A]	193[A]	318[A]	327[A]	327[A]	338[A]	329[A]	327[A]	322[A]	342[A]	312[A]	304[A]								
12:30 PDT													336[A]	327[A]	308[A]	338[A]	17.5[A]	11.3[A]	7.36[A]	6.66[A]
12:30 PST	130[A]	209[A]	342[A]	322[A]	320[A]	308[A]	310[A]	340[A]	336[A]	316[A]	308[A]	314[A]								
12:45 PDT													340[A]	331[A]	316[A]	342[A]	18.5[A]	10.9[A]	7.73[A]	6.00[A]
12:45 PST	125[A]	199[A]	334[A]	346[A]	293[A]	296[A]	300[A]	334[A]	324[A]	322[A]	325[A]	320[A]								
13:00 PDT													327[A]	320[A]	310[A]	340[A]	18.0[A]	10.9[A]	7.36[A]	6.00[A]
13:00 PST	119[A]	172[A]	360[A]	334[A]	304[A]	322[A]	308[A]	327[A]	338[A]	338[A]	320[A]	318[A]								
13:15 PDT													325[A]	308[A]	320[A]	342[A]	17.0[A]	10.6[A]	7.73[A]	6.00[A]
13:15 PST	114[A]	206[A]	348[A]	320[A]	272[A]	289[A]	338[A]	340[A]	340[A]	306[A]	324[A]	320[A]								
13:30 PDT													331[A]	320[A]	318[A]	331[A]	17.0[A]	10.6[A]	7.36[A]	6.00[A]
13:30 PST	119[A]	193[A]	329[A]	306[A]	348[A]	348[A]	298[A]	329[A]	336[A]	327[A]	334[A]	329[A]								
13:45 PDT													334[A]	324[A]	308[A]	338[A]	17.0[A]	10.2[A]	7.73[A]	6.00[A]
13:45 PST	115[A]	196[A]	346[A]	302[A]	325[A]	318[A]	294[A]	336[A]	320[A]	340[A]	312[A]	327[A]								
14:00 PDT													336[A]	327[A]	310[A]	342[A]	16.6[A]	10.6[A]	7.73[A]	6.00[A]
14:00 PST	109[A]	174[A]	350[A]	300[A]	340[A]	294[A]	312[A]	310[A]	327[A]	338[A]	306[A]	334[A]								
14:15 PDT													329[A]	331[A]	322[A]	334[A]	17.5[A]	10.9[A]	7.36[A]	6.00[A]
14:15 PST	118[A]	175[A]	306[A]	291[A]	325[A]	312[A]	318[A]	320[A]	350[A]	312[A]	340[A]	312[A]								
14:30 PDT													334[A]	325[A]	312[A]	338[A]	16.6[A]	10.6[A]	7.36[A]	6.00[A]
14:30 PST	109[A]	210[A]	358[A]	324[A]	340[A]	304[A]	287[A]	364[A]	320[A]	320[A]	312[A]	314[A]								
14:45 PDT													320[A]	327[A]	318[A]	331[A]	17.0[A]	10.6[A]	7.36[A]	5.69[A]
14:45 PST	105[A]	242[A]	362[A]	344[A]	304[A]	327[A]	294[A]	329[A]	331[A]	346[A]	312[A]	316[A]								
15:00 PDT													334[A]	329[A]	327[A]	340[A]	17.0[A]	10.9[A]	7.36[A]	6.32[A]
15:00 PST	95.8[A]	265[A]	342[A]	334[A]	336[A]	312[A]	316[A]	346[A]	344[A]	318[A]	325[A]	322[A]								
15:15 PDT													340[A]	329[A]	306[A]	336[A]	17.0[A]	10.6[A]	7.36[A]	6.32[A]

TIME	Feb 28	Mar 1	Mar 2	Mar 3	Mar 4	Mar 5	Mar 6	Mar 7	Mar 8	Mar 9	Mar 10	Mar 11	Mar 12	Mar 13	Mar 14	Mar 15	Mar 16	Mar 17	Mar 18	Mar 19
15:15 PST	101[A]	298[A]	331[A]	362[A]	327[A]	312[A]	312[A]	331[A]	320[A]	324[A]	322[A]	322[A]								
15:30 PDT													327[A]	327[A]	331[A]	338[A]	15.6[A]	10.2[A]	7.00[A]	5.69[A]
15:30 PST	105[A]	314[A]	346[A]	340[A]	324[A]	302[A]	310[A]	316[A]	322[A]	324[A]	310[A]	302[A]								
15:45 PDT													336[A]	327[A]	318[A]	331[A]	15.6[A]	10.2[A]	7.36[A]	5.69[A]
15:45 PST	95.8[A]	312[A]	346[A]	366[A]	324[A]	296[A]	322[A]	306[A]	316[A]	325[A]	320[A]	336[A]								
16:00 PDT													348[A]	329[A]	325[A]	340[A]	16.1[A]	10.2[A]	7.00[A]	6.00[A]
16:00 PST	89.4[A]	348[A]	371[A]	320[A]	346[A]	318[A]	314[A]	336[A]	306[A]	327[A]	325[A]	312[A]								
16:15 PDT													327[A]	334[A]	322[A]	340[A]	15.6[A]	10.2[A]	7.00[A]	5.69[A]
16:15 PST	96.9[A]	369[A]	325[A]	320[A]	344[A]	318[A]	310[A]	327[A]	338[A]	338[A]	312[A]	322[A]								
16:30 PDT													334[A]	320[A]	322[A]	342[A]	15.1[A]	10.2[A]	7.00[A]	5.69[A]
16:30 PST	90.5[A]	336[A]	348[A]	331[A]	325[A]	324[A]	340[A]	336[A]	316[A]	340[A]	316[A]	331[A]								
16:45 PDT													338[A]	331[A]	325[A]	336[A]	15.6[A]	9.74[A]	7.36[A]	5.69[A]
16:45 PST	95.8[A]	322[A]	362[A]	318[A]	336[A]	324[A]	318[A]	342[A]	325[A]	325[A]	334[A]	314[A]								
17:00 PDT													342[A]	334[A]	322[A]	338[A]	15.1[A]	9.74[A]	6.66[A]	5.69[A]
17:00 PST	94.8[A]	388[A]	348[A]	344[A]	364[A]	310[A]	320[A]	312[A]	314[A]	342[A]	300[A]	316[A]								
17:15 PDT													327[A]	316[A]	324[A]	338[A]	15.1[A]	10.2[A]	7.36[A]	5.69[A]
17:15 PST	98.0[A]	350[A]	312[A]	334[A]	318[A]	329[A]	352[A]	338[A]	327[A]	316[A]	304[A]	310[A]								
17:30 PDT													331[A]	331[A]	320[A]	340[A]	15.1[A]	9.74[A]	7.00[A]	5.69[A]
17:30 PST	92.6[A]	358[A]	348[A]	325[A]	336[A]	308[A]	352[A]	320[A]	336[A]	325[A]	320[A]	316[A]								
17:45 PDT													340[A]	325[A]	316[A]	338[A]	15.1[A]	9.74[A]	7.00[A]	5.69[A]
17:45 PST	84.2[A]	322[A]	336[A]	334[A]	336[A]	308[A]	327[A]	324[A]	342[A]	350[A]	322[A]	327[A]								
18:00 PDT													334[A]	344[A]	316[A]	342[A]	15.1[A]	10.2[A]	6.66[A]	5.69[A]
18:00 PST	90.5[A]	340[A]	338[A]	314[A]	336[A]	308[A]	300[A]	336[A]	318[A]	322[A]	310[A]	308[A]								
18:15 PDT													331[A]	344[A]	322[A]	338[A]	14.7[A]	9.74[A]	6.66[A]	5.39[A]
18:15 PST	88.4[A]	350[A]	348[A]	322[A]	334[A]	334[A]	318[A]	338[A]	329[A]	322[A]	338[A]	322[A]								
18:30 PDT													336[A]	312[A]	304[A]	338[A]	14.7[A]	10.2[A]	6.66[A]	5.69[A]
18:30 PST	82.2[A]	344[A]	340[A]	346[A]	366[A]	298[A]	329[A]	329[A]	336[A]	316[A]	310[A]	340[A]								
18:45 PDT													329[A]	338[A]	316[A]	331[A]	14.2[A]	9.32[A]	7.00[A]	5.39[A]
18:45 PST	82.2[A]	348[A]	325[A]	334[A]	324[A]	342[A]	329[A]	318[A]	322[A]	336[A]	310[A]	310[A]								
19:00 PDT													324[A]	324[A]	325[A]	312[A]	14.2[A]	10.2[A]	7.00[A]	6.00[A]
19:00 PST	83.2[A]	362[A]	354[A]	350[A]	346[A]	312[A]	348[A]	338[A]	314[A]	336[A]	324[A]	314[A]								

TIME	Feb 28	Mar 1	Mar 2	Mar 3	Mar 4	Mar 5	Mar 6	Mar 7	Mar 8	Mar 9	Mar 10	Mar 11	Mar 12	Mar 13	Mar 14	Mar 15	Mar 16	Mar 17	Mar 18	Mar 19
19:15 PDT													336[A]	314[A]	325[A]	230[A]	14.2[A]	10.2[A]	7.00[A]	5.69[A]
19:15 PST	76.2[A]	338[A]	340[A]	348[A]	334[A]	314[A]	336[A]	344[A]	340[A]	327[A]	324[A]	312[A]								
19:30 PDT													325[A]	293[A]	331[A]	162[A]	14.2[A]	9.32[A]	7.36[A]	5.39[A]
19:30 PST	105[A]	324[A]	352[A]	327[A]	312[A]	316[A]	331[A]	325[A]	291[A]	318[A]	346[A]	314[A]								
19:45 PDT													331[A]	296[A]	329[A]	131[A]	14.7[A]	9.32[A]	6.66[A]	6.00[A]
19:45 PST	134[A]	348[A]	346[A]	338[A]	308[A]	324[A]	320[A]	322[A]	327[A]	320[A]	316[A]	314[A]								
20:00 PDT													342[A]	285[A]	331[A]	109[A]	14.2[A]	9.74[A]	6.66[A]	5.69[A]
20:00 PST	174[A]	327[A]	298[A]	331[A]	340[A]	310[A]	306[A]	334[A]	308[A]	336[A]	320[A]	314[A]								
20:15 PDT													334[A]	314[A]	322[A]	98.0[A]	13.8[A]	9.74[A]	7.00[A]	5.09[A]
20:15 PST	181[A]	329[A]	356[A]	310[A]	334[A]	298[A]	314[A]	322[A]	320[A]	324[A]	306[A]	314[A]								
20:30 PDT													329[A]	302[A]	320[A]	86.3[A]	14.2[A]	8.90[A]	7.00[A]	5.39[A]
20:30 PST	186[A]	358[A]	306[A]	336[A]	336[A]	322[A]	327[A]	340[A]	338[A]	314[A]	312[A]	314[A]								
20:45 PDT													325[A]	318[A]	336[A]	80.2[A]	13.8[A]	9.32[A]	6.66[A]	5.69[A]
20:45 PST	203[A]	362[A]	324[A]	324[A]	329[A]	300[A]	348[A]	322[A]	324[A]	308[A]	322[A]	310[A]								
21:00 PDT													336[A]	278[A]	331[A]	72.4[A]	14.2[A]	9.74[A]	6.66[A]	5.69[A]
21:00 PST	201[A]	354[A]	329[A]	338[A]	318[A]	304[A]	329[A]	320[A]	304[A]	327[A]	327[A]	322[A]								
21:15 PDT													327[A]	320[A]	324[A]	65.9[A]	13.4[A]	8.90[A]	7.00[A]	5.39[A]
21:15 PST	210[A]	358[A]	289[A]	325[A]	329[A]	324[A]	344[A]	340[A]	344[A]	324[A]	310[A]	325[A]								
21:30 PDT													329[A]	304[A]	322[A]	63.2[A]	13.4[A]	9.32[A]	6.66[A]	5.39[A]
21:30 PST	207[A]	362[A]	344[A]	324[A]	312[A]	310[A]	322[A]	338[A]	320[A]	322[A]	329[A]	340[A]								
21:45 PDT													322[A]	306[A]	322[A]	63.2[A]	13.4[A]	8.90[A]	6.66[A]	5.09[A]
21:45 PST	230[A]	329[A]	340[A]	346[A]	324[A]	310[A]	346[A]	342[A]	318[A]	322[A]	327[A]	324[A]								
22:00 PDT													338[A]	293[A]	329[A]	57.4[A]	12.9[A]	8.90[A]	6.32[A]	5.39[A]
22:00 PST	196[A]	381[A]	322[A]	320[A]	340[A]	304[A]	344[A]	314[A]	325[A]	322[A]	320[A]	334[A]								
22:15 PDT													324[A]	308[A]	324[A]	53.6[A]	13.4[A]	9.32[A]	6.66[A]	5.39[A]
22:15 PST	207[A]	336[A]	334[A]	293[A]	308[A]	316[A]	325[A]	314[A]	352[A]	316[A]	316[A]	327[A]								
22:30 PDT													331[A]	298[A]	322[A]	52.7[A]	12.9[A]	8.90[A]	6.32[A]	5.39[A]
22:30 PST	203[A]	364[A]	342[A]	318[A]	329[A]	329[A]	338[A]	318[A]	322[A]	334[A]	325[A]	346[A]								
22:45 PDT													329[A]	314[A]	331[A]	47.4[A]	13.8[A]	8.50[A]	6.32[A]	5.09[A]
22:45 PST	225[A]	331[A]	334[A]	350[A]	306[A]	296[A]	329[A]	331[A]	324[A]	329[A]	320[A]	336[A]								
23:00 PDT													342[A]	300[A]	325[A]	46.5[A]	13.4[A]	8.50[A]	6.66[A]	5.39[A]

TIME	Feb 28	Mar 1	Mar 2	Mar 3	Mar 4	Mar 5	Mar 6	Mar 7	Mar 8	Mar 9	Mar 10	Mar 11	Mar 12	Mar 13	Mar 14	Mar 15	Mar 16	Mar 17	Mar 18	Mar 19
23:00 PST	207[A]	346[A]	322[A]	331[A]	348[A]	294[A]	325[A]	322[A]	316[A]	320[A]	314[A]	325[A]								
23:15 PDT													334[A]	314[A]	325[A]	44.0[A]	12.9[A]	8.50[A]	6.66[A]	5.69[A]
23:15 PST	232[A]	334[A]	342[A]	320[A]	348[A]	318[A]	314[A]	312[A]	329[A]	310[A]	329[A]	327[A]								
23:30 PDT													334[A]	296[A]	327[A]	42.3[A]	12.9[A]	8.50[A]	6.32[A]	5.09[A]
23:30 PST	222[A]	352[A]	344[A]	325[A]	342[A]	322[A]	331[A]	327[A]	327[A]	316[A]	310[A]	340[A]								
23:45 PDT													344[A]	310[A]	325[A]	41.5[A]	12.9[A]	8.50[A]	6.32[A]	5.69[A]
23:45 PST	212[A]	362[A]	312[A]	334[A]	294[A]	291[A]	338[A]	316[A]	329[A]	336[A]	314[A]	344[A]								
COUNT	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**92**	**96**	**96**	**96**	**96**	**96**	**96**	**96**
MAX	**591**	**388**	**381**	**373**	**366**	**356**	**352**	**364**	**358**	**350**	**346**	**346**	**348**	**344**	**350**	**344**	**39.2**	**12.9**	**8.90**	**7.00**
MIN	**76.2**	**169**	**289**	**269**	**272**	**289**	**281**	**302**	**291**	**302**	**300**	**294**	**318**	**278**	**283**	**41.5**	**12.9**	**8.50**	**6.32**	**5.09**

Explanation

A	Approved for publication -- Processing and review completed.

2019

Discharge, cubic feet per second

TIME	Feb 15	Feb 16	Feb 17	Feb 18	Feb 19	Feb 20	Feb 21	Feb 22	Feb 23	Feb 24	Feb 25	Feb 26	Feb 27	Feb 28	Mar 1	Mar 2	Mar 3	Mar 4	Mar 5	Mar 6	Mar 7	Mar 8	Mar 9	Mar 10
00:00 PST	128[A]	310[A]	325[A]	344[A]	310[A]	329[A]	340[A]	369[A]	336[A]	338[A]	316[A]	296[A]	314[A]	312[A]	296[A]	294[A]	293[A]	289[A]	296[A]	289[A]	274[A]	19.6[A]	10.9[A]	7.00[A]
00:15 PST	136[A]	329[A]	325[A]	334[A]	325[A]	314[A]	325[A]	392[A]	350[A]	316[A]	329[A]	274[A]	312[A]	322[A]	276[A]	306[A]	296[A]	304[A]	298[A]	261[A]	296[A]	20.7[A]	10.6[A]	7.36[A]
00:30 PST	123[A]	338[A]	316[A]	346[A]	320[A]	331[A]	342[A]	360[A]	308[A]	329[A]	310[A]	320[A]	304[A]	312[A]	304[A]	294[A]	283[A]	274[A]	287[A]	283[A]	289[A]	20.1[A]	10.2[A]	7.36[A]
00:45 PST	116[A]	325[A]	338[A]	324[A]	327[A]	322[A]	322[A]	386[A]	325[A]	340[A]	320[A]	320[A]	302[A]	318[A]	314[A]	298[A]	298[A]	300[A]	302[A]	278[A]	294[A]	20.7[A]	9.74[A]	7.73[A]
01:00 PST	119[A]	327[A]	308[A]	350[A]	348[A]	329[A]	364[A]	379[A]	316[A]	336[A]	314[A]	298[A]	322[A]	320[A]	298[A]	296[A]	294[A]	283[A]	296[A]	267[A]	270[A]	19.6[A]	10.2[A]	7.00[A]
01:15 PST	108[A]	329[A]	336[A]	344[A]	325[A]	338[A]	360[A]	364[A]	346[A]	318[A]	324[A]	322[A]	306[A]	312[A]	289[A]	289[A]	294[A]	287[A]	287[A]	296[A]	270[A]	19.1[A]	10.2[A]	7.00[A]
01:30 PST	106[A]	348[A]	314[A]	285[A]	342[A]	308[A]	350[A]	392[A]	308[A]	318[A]	310[A]	314[A]	308[A]	308[A]	322[A]	281[A]	314[A]	300[A]	298[A]	304[A]	287[A]	19.1[A]	9.32[A]	7.00[A]
01:45 PST	105[A]	356[A]	334[A]	346[A]	306[A]	318[A]	344[A]	371[A]	327[A]	329[A]	310[A]	296[A]	281[A]	276[A]	296[A]	296[A]	285[A]	296[A]	300[A]	276[A]	276[A]	19.1[A]	9.32[A]	7.73[A]
02:00 PST	91.5[A]	352[A]	320[A]	318[A]	322[A]	325[A]	379[A]	384[A]	312[A]	314[A]	336[A]	306[A]	310[A]	331[A]	278[A]	302[A]	281[A]	308[A]	287[A]	287[A]	265[A]	18.5[A]	10.2[A]	
02:15 PST	91.5[A]	364[A]	344[A]	350[A]	336[A]	324[A]	358[A]	350[A]	312[A]	334[A]	324[A]	316[A]	306[A]	285[A]	308[A]	302[A]	276[A]	279[A]	287[A]	289[A]	274[A]	18.5[A]	10.2[A]	
02:30 PST	92.6[A]	327[A]	329[A]	324[A]	324[A]	324[A]	346[A]	377[A]	338[A]	346[A]	318[A]	304[A]	336[A]	293[A]	304[A]	304[A]	294[A]	300[A]	300[A]	289[A]	274[A]	19.1[A]	10.2[A]	
02:45 PST	89.4[A]	362[A]	310[A]	340[A]	334[A]	344[A]	388[A]	346[A]	336[A]	340[A]	302[A]	308[A]	316[A]	308[A]	294[A]	312[A]	300[A]	285[A]	294[A]	281[A]	270[A]	17.5[A]	9.74[A]	
03:00 PDT																								6.66[A]
03:00 PST	87.3[A]	360[A]	287[A]	293[A]	329[A]	316[A]	346[A]	364[A]	324[A]	325[A]	324[A]	291[A]	306[A]	293[A]	287[A]	291[A]	279[A]	310[A]	291[A]	291[A]	267[A]	17.0[A]	8.90[A]	
03:15 PDT																								7.36[A]
03:15 PST	75.3[A]	356[A]	289[A]	344[A]	334[A]	322[A]	360[A]	356[A]	329[A]	344[A]	322[A]	304[A]	302[A]	304[A]	293[A]	298[A]	269[A]	296[A]	294[A]	272[A]	265[A]	17.0[A]	10.2[A]	
03:30 PDT																								7.73[A]
03:30 PST	76.2[A]	362[A]	325[A]	364[A]	306[A]	331[A]	369[A]	364[A]	324[A]	302[A]	306[A]	302[A]	320[A]	308[A]	310[A]	316[A]	289[A]	310[A]	293[A]	285[A]	279[A]	18.5[A]	9.74[A]	
03:45 PDT																								7.00[A]
03:45 PST	84.2[A]	352[A]	336[A]	362[A]	318[A]	320[A]	377[A]	369[A]	314[A]	331[A]	310[A]	304[A]	312[A]	298[A]	291[A]	304[A]	293[A]	283[A]	287[A]	283[A]	279[A]	17.0[A]	8.50[A]	
04:00 PDT																								7.00[A]
04:00 PST	80.2[A]	381[A]	318[A]	346[A]	320[A]	327[A]	356[A]	344[A]	327[A]	350[A]	310[A]	320[A]	300[A]	308[A]	322[A]	304[A]	306[A]	296[A]	285[A]	283[A]	272[A]	16.1[A]	10.2[A]	
04:15 PDT																								7.00[A]
04:15 PST	75.3[A]	362[A]	329[A]	320[A]	354[A]	331[A]	366[A]	331[A]	342[A]	342[A]	312[A]	306[A]	314[A]	308[A]	312[A]	310[A]	296[A]	308[A]	302[A]	294[A]	279[A]	17.0[A]	9.74[A]	
04:30 PDT																								7.36[A]
04:30 PST	79.2[A]	354[A]	314[A]	358[A]	308[A]	318[A]	377[A]	348[A]	352[A]	314[A]	338[A]	310[A]	314[A]	276[A]	298[A]	294[A]	251[A]	285[A]	283[A]	267[A]	279[A]	16.6[A]	8.90[A]	
04:45 PDT																								6.66[A]
04:45 PST	77.2[A]	346[A]	318[A]	369[A]	312[A]	316[A]	373[A]	350[A]	324[A]	327[A]	304[A]	308[A]	306[A]	312[A]	304[A]	293[A]	281[A]	298[A]	289[A]	252[A]	285[A]	17.0[A]	8.50[A]	
05:00 PDT																								7.73[A]
05:00 PST	73.3[A]	289[A]	356[A]	340[A]	327[A]	318[A]	360[A]	294[A]	346[A]	329[A]	312[A]	287[A]	304[A]	306[A]	274[A]	304[A]	274[A]	298[A]	304[A]	278[A]	285[A]	16.6[A]	9.32[A]	
05:15 PDT																								7.36[A]

TIME	Feb 15	Feb 16	Feb 17	Feb 18	Feb 19	Feb 20	Feb 21	Feb 22	Feb 23	Feb 24	Feb 25	Feb 26	Feb 27	Feb 28	Mar 1	Mar 2	Mar 3	Mar 4	Mar 5	Mar 6	Mar 7	Mar 8	Mar 9	Mar 10
05:15 PST	69.6[A]	352[A]	308[A]	362[A]	291[A]	342[A]	371[A]	329[A]	306[A]	331[A]	308[A]	300[A]	291[A]	302[A]	281[A]	298[A]	314[A]	291[A]	278[A]	293[A]	276[A]	16.6[A]	9.74[A]	
05:30 PDT																								7.36[A]
05:30 PST	64.1[A]	362[A]	310[A]	331[A]	318[A]	342[A]	369[A]	344[A]	342[A]	329[A]	304[A]	306[A]	293[A]	291[A]	302[A]	304[A]	296[A]	304[A]	272[A]	289[A]	279[A]	16.6[A]	8.90[A]	
05:45 PDT																								6.66[A]
05:45 PST	69.6[A]	338[A]	350[A]	377[A]	324[A]	329[A]	394[A]	322[A]	302[A]	312[A]	318[A]	322[A]	298[A]	302[A]	298[A]	294[A]	289[A]	306[A]	267[A]	291[A]	272[A]	16.6[A]	8.90[A]	
06:00 PDT																								6.32[A]
06:00 PST	65.9[A]	352[A]	329[A]	316[A]	331[A]	302[A]	379[A]	327[A]	334[A]	310[A]	329[A]	334[A]	329[A]	293[A]	258[A]	293[A]	298[A]	289[A]	298[A]	289[A]	272[A]	16.6[A]	8.90[A]	
06:15 PDT																								7.00[A]
06:15 PST	64.1[A]	362[A]	306[A]	344[A]	329[A]	338[A]	377[A]	331[A]	318[A]	322[A]	329[A]	298[A]	304[A]	314[A]	312[A]	296[A]	298[A]	304[A]	278[A]	287[A]	281[A]	16.1[A]	8.90[A]	
06:30 PDT																								7.00[A]
06:30 PST	58.4[A]	322[A]	340[A]	366[A]	298[A]	316[A]	362[A]	318[A]	331[A]	302[A]	327[A]	300[A]	306[A]	306[A]	281[A]	278[A]	289[A]	287[A]	279[A]	294[A]	287[A]	16.6[A]	8.50[A]	
06:45 PDT																								6.66[A]
06:45 PST	66.8[A]	331[A]	336[A]	316[A]	306[A]	350[A]	379[A]	329[A]	348[A]	329[A]	314[A]	325[A]	314[A]	270[A]	316[A]	289[A]	296[A]	291[A]	306[A]	274[A]	296[A]	15.6[A]	8.50[A]	
07:00 PDT																								7.36[A]
07:00 PST	58.4[A]	308[A]	320[A]	340[A]	316[A]	325[A]	384[A]	310[A]	350[A]	320[A]	320[A]	308[A]	314[A]	314[A]	294[A]	312[A]	308[A]	294[A]	291[A]	285[A]	283[A]	15.6[A]	8.50[A]	
07:15 PDT																								6.66[A]
07:15 PST	57.4[A]	314[A]	342[A]	352[A]	325[A]	296[A]	392[A]	336[A]	334[A]	320[A]	322[A]	320[A]	318[A]	312[A]	298[A]	294[A]	320[A]	287[A]	293[A]	245[A]	279[A]	16.1[A]	8.90[A]	
07:30 PDT																								7.00[A]
07:30 PST	61.3[A]	331[A]	344[A]	325[A]	325[A]	320[A]	381[A]	329[A]	346[A]	294[A]	304[A]	312[A]	318[A]	302[A]	291[A]	312[A]	302[A]	300[A]	278[A]	281[A]	298[A]	15.1[A]	7.73[A]	
07:45 PDT																								6.66[A]
07:45 PST	53.6[A]	327[A]	336[A]	350[A]	310[A]	285[A]	344[A]	348[A]	331[A]	327[A]	310[A]	316[A]	316[A]	302[A]	294[A]	287[A]	304[A]	279[A]	287[A]	289[A]	272[A]	15.6[A]	8.90[A]	
08:00 PDT																								6.66[A]
08:00 PST	57.4[A]	306[A]	340[A]	331[A]	320[A]	331[A]	377[A]	306[A]	331[A]	334[A]	310[A]	308[A]	304[A]	287[A]	316[A]	291[A]	281[A]	294[A]	272[A]	278[A]	289[A]	15.1[A]	9.32[A]	
08:15 PDT																								6.66[A]
08:15 PST	60.3[A]	344[A]	327[A]	375[A]	324[A]	322[A]	386[A]	366[A]	348[A]	320[A]	334[A]	298[A]	310[A]	312[A]	294[A]	314[A]	293[A]	302[A]	296[A]	281[A]	289[A]	16.1[A]	8.50[A]	
08:30 PDT																								6.66[A]
08:30 PST	55.5[A]	331[A]	322[A]	314[A]	344[A]	308[A]	384[A]	327[A]	325[A]	322[A]	300[A]	324[A]	306[A]	308[A]	287[A]	314[A]	283[A]	285[A]	300[A]	298[A]	294[A]	15.1[A]	8.50[A]	
08:45 PDT																								7.00[A]
08:45 PST	52.7[A]	325[A]	322[A]	325[A]	318[A]	318[A]	390[A]	352[A]	310[A]	308[A]	322[A]	304[A]	306[A]	310[A]	294[A]	314[A]	279[A]	306[A]	289[A]	272[A]	260[A]	14.2[A]	8.50[A]	
09:00 PDT																								6.66[A]
09:00 PST	54.5[A]	352[A]	294[A]	375[A]	298[A]	325[A]	381[A]	344[A]	329[A]	302[A]	318[A]	276[A]	294[A]	314[A]	298[A]	302[A]	296[A]	308[A]	296[A]	263[A]	274[A]	14.7[A]	8.11[A]	
09:15 PDT																								6.66[A]

TIME	Feb 15	Feb 16	Feb 17	Feb 18	Feb 19	Feb 20	Feb 21	Feb 22	Feb 23	Feb 24	Feb 25	Feb 26	Feb 27	Feb 28	Mar 1	Mar 2	Mar 3	Mar 4	Mar 5	Mar 6	Mar 7	Mar 8	Mar 9	Mar 10
09:15 PST	46.5[A]	312[A]	312[A]	320[A]	338[A]	320[A]	399[A]	322[A]	338[A]	312[A]	312[A]	298[A]	312[A]	304[A]	308[A]	304[A]	289[A]	283[A]	285[A]	279[A]	276[A]	15.6[A]	8.90[A]	
09:30 PDT																								6.32[A]
09:30 PST	52.7[A]	329[A]	322[A]	338[A]	329[A]	324[A]	375[A]	352[A]	314[A]	331[A]	308[A]	324[A]	310[A]	312[A]	306[A]	293[A]	296[A]	312[A]	285[A]	291[A]	287[A]	14.7[A]	8.90[A]	
09:45 PDT																								6.32[A]
09:45 PST	47.4[A]	371[A]	342[A]	340[A]	336[A]	314[A]	373[A]	327[A]	324[A]	306[A]	310[A]	296[A]	306[A]	296[A]	298[A]	314[A]	300[A]	294[A]	278[A]	289[A]	285[A]	14.2[A]	7.00[A]	
10:00 PDT																								7.00[A]
10:00 PST	44.0[A]	340[A]	298[A]	325[A]	270[A]	327[A]	381[A]	360[A]	336[A]	304[A]	298[A]	294[A]	308[A]	300[A]	294[A]	312[A]	294[A]	285[A]	298[A]	278[A]	270[A]	13.8[A]	8.90[A]	
10:15 PDT																								6.32[A]
10:15 PST	44.8[A]	334[A]	350[A]	331[A]	327[A]	298[A]	342[A]	322[A]	314[A]	327[A]	314[A]	304[A]	306[A]	314[A]	291[A]	296[A]	304[A]	279[A]	289[A]	274[A]	274[A]	14.7[A]	8.90[A]	
10:30 PDT																								7.00[A]
10:30 PST	48.2[A]	348[A]	325[A]	306[A]	346[A]	300[A]	373[A]	348[A]	340[A]	310[A]	296[A]	302[A]	300[A]	316[A]	310[A]	306[A]	293[A]	308[A]	285[A]	291[A]	267[A]	13.8[A]	8.11[A]	
10:45 PDT																								6.66[A]
10:45 PST	43.1[A]	356[A]	329[A]	346[A]	320[A]	296[A]	379[A]	350[A]	293[A]	312[A]	322[A]	312[A]	294[A]	308[A]	296[A]	318[A]	287[A]	291[A]	289[A]	269[A]	265[A]	14.2[A]	8.11[A]	
11:00 PDT																								6.32[A]
11:00 PST	41.5[A]	316[A]	294[A]	291[A]	316[A]	318[A]	388[A]	329[A]	340[A]	331[A]	325[A]	310[A]	294[A]	314[A]	312[A]	308[A]	308[A]	304[A]	283[A]	298[A]	263[A]	14.2[A]	7.73[A]	
11:15 PDT																								7.00[A]
11:15 PST	44.0[A]	356[A]	346[A]	354[A]	329[A]	325[A]	362[A]	269[A]	344[A]	318[A]	320[A]	310[A]	294[A]	285[A]	283[A]	322[A]	279[A]	289[A]	276[A]	276[A]	263[A]	14.2[A]	8.50[A]	
11:30 PDT																								6.66[A]
11:30 PST	37.6[A]	314[A]	306[A]	306[A]	354[A]	320[A]	350[A]	356[A]	340[A]	320[A]	312[A]	316[A]	312[A]	314[A]	291[A]	304[A]	291[A]	291[A]	289[A]	281[A]	279[A]	13.4[A]	8.11[A]	
11:45 PDT																								6.32[A]
11:45 PST	40.7[A]	322[A]	352[A]	348[A]	325[A]	331[A]	369[A]	331[A]	340[A]	310[A]	325[A]	318[A]	304[A]	279[A]	306[A]	276[A]	304[A]	289[A]	285[A]	258[A]	289[A]	14.2[A]	8.11[A]	
12:00 PDT																								6.32[A]
12:00 PST	43.1[A]	316[A]	296[A]	344[A]	354[A]	336[A]	340[A]	325[A]	325[A]	325[A]	336[A]	302[A]	304[A]	298[A]	300[A]	291[A]	279[A]	310[A]	278[A]	270[A]	279[A]	13.8[A]	7.73[A]	
12:15 PDT																								6.66[A]
12:15 PST	36.9[A]	302[A]	306[A]	310[A]	336[A]	329[A]	379[A]	340[A]	327[A]	325[A]	331[A]	334[A]	308[A]	314[A]	314[A]	281[A]	304[A]	298[A]	287[A]	293[A]	291[A]	14.2[A]	7.36[A]	
12:30 PDT																								6.66[A]
12:30 PST	39.9[A]	362[A]	329[A]	312[A]	320[A]	324[A]	358[A]	350[A]	327[A]	320[A]	318[A]	285[A]	306[A]	304[A]	285[A]	300[A]	300[A]	285[A]	289[A]	278[A]	279[A]	13.4[A]	7.73[A]	
12:45 PDT																								6.66[A]
12:45 PST	39.9[A]	331[A]	294[A]	338[A]	310[A]	310[A]	346[A]	306[A]	331[A]	314[A]	304[A]	300[A]	312[A]	320[A]	312[A]	300[A]	276[A]	287[A]	291[A]	274[A]	237[A]	12.9[A]	8.90[A]	
13:00 PDT																								6.32[A]
13:00 PST	37.6[A]	362[A]	342[A]	316[A]	281[A]	312[A]	354[A]	334[A]	340[A]	308[A]	312[A]	325[A]	314[A]	294[A]	291[A]	294[A]	279[A]	302[A]	281[A]	291[A]	181[A]	13.8[A]	7.73[A]	
13:15 PDT																								6.66[A]

TIME	Feb 15	Feb 16	Feb 17	Feb 18	Feb 19	Feb 20	Feb 21	Feb 22	Feb 23	Feb 24	Feb 25	Feb 26	Feb 27	Feb 28	Mar 1	Mar 2	Mar 3	Mar 4	Mar 5	Mar 6	Mar 7	Mar 8	Mar 9	Mar 10
13:15 PST	43.1[A]	308[A]	336[A]	331[A]	331[A]	322[A]	352[A]	322[A]	331[A]	320[A]	314[A]	331[A]	316[A]	296[A]	300[A]	302[A]	302[A]	283[A]	293[A]	272[A]	140[A]	13.4[A]	8.11[A]	
13:30 PDT																								6.32[A]
13:30 PST	47.4[A]	334[A]	334[A]	314[A]	340[A]	331[A]	324[A]	358[A]	338[A]	327[A]	324[A]	331[A]	320[A]	312[A]	302[A]	279[A]	306[A]	302[A]	298[A]	276[A]	114[A]	14.2[A]	7.36[A]	
13:45 PDT																								6.66[A]
13:45 PST	124[A]	329[A]	327[A]	331[A]	318[A]	279[A]	366[A]	348[A]	322[A]	314[A]	312[A]	320[A]	310[A]	306[A]	302[A]	302[A]	298[A]	304[A]	274[A]	272[A]	94.8[A]	13.4[A]	7.36[A]	
14:00 PDT																								6.32[A]
14:00 PST	181[A]	334[A]	325[A]	324[A]	308[A]	308[A]	375[A]	344[A]	344[A]	308[A]	302[A]	304[A]	302[A]	312[A]	294[A]	279[A]	279[A]	310[A]	285[A]	289[A]	87.3[A]	13.8[A]	7.00[A]	
14:15 PDT																								6.32[A]
14:15 PST	223[A]	354[A]	312[A]	324[A]	294[A]	314[A]	366[A]	324[A]	324[A]	331[A]	278[A]	314[A]	316[A]	306[A]	302[A]	294[A]	281[A]	308[A]	291[A]	281[A]	80.2[A]	12.9[A]	7.73[A]	
14:30 PDT																								7.00[A]
14:30 PST	283[A]	324[A]	336[A]	291[A]	312[A]	310[A]	354[A]	342[A]	320[A]	320[A]	324[A]	320[A]	308[A]	314[A]	302[A]	289[A]	278[A]	306[A]	281[A]	281[A]	72.4[A]	13.4[A]	8.50[A]	
14:45 PDT																								6.00[A]
14:45 PST	296[A]	334[A]	329[A]	336[A]	298[A]	310[A]	384[A]	342[A]	287[A]	327[A]	312[A]	287[A]	296[A]	308[A]	308[A]	308[A]	298[A]	302[A]	283[A]	281[A]	61.3[A]	12.1[A]	7.73[A]	
15:00 PDT																								7.00[A]
15:00 PST	300[A]	329[A]	304[A]	325[A]	322[A]	338[A]	342[A]	334[A]	314[A]	310[A]	318[A]	300[A]	314[A]	300[A]	302[A]	304[A]	308[A]	267[A]	285[A]	291[A]	65.0[A]	12.1[A]	7.00[A]	
15:15 PDT																								6.32[A]
15:15 PST	302[A]	294[A]	272[A]	354[A]	314[A]	310[A]	331[A]	354[A]	294[A]	324[A]	342[A]	304[A]	306[A]	296[A]	283[A]	283[A]	278[A]	291[A]	293[A]	276[A]	59.3[A]	12.5[A]	8.11[A]	
15:30 PDT																								6.66[A]
15:30 PST	285[A]	334[A]	304[A]	276[A]	312[A]	331[A]	336[A]	364[A]	318[A]	316[A]	314[A]	329[A]	324[A]	312[A]	276[A]	306[A]	304[A]	298[A]	289[A]	283[A]	55.5[A]	12.9[A]	7.73[A]	
15:45 PDT																								6.00[A]
15:45 PST	302[A]	325[A]	291[A]	366[A]	287[A]	336[A]	348[A]	334[A]	348[A]	316[A]	312[A]	298[A]	294[A]	300[A]	308[A]	300[A]	293[A]	276[A]	274[A]	293[A]	52.7[A]	12.5[A]	7.73[A]	
16:00 PDT																								6.32[A]
16:00 PST	308[A]	316[A]	320[A]	334[A]	308[A]	320[A]	352[A]	346[A]	296[A]	310[A]	327[A]	285[A]	325[A]	289[A]	296[A]	287[A]	298[A]	302[A]	285[A]	289[A]	49.1[A]	12.9[A]	7.73[A]	
16:15 PDT																								6.32[A]
16:15 PST	329[A]	296[A]	340[A]	296[A]	302[A]	316[A]	360[A]	327[A]	342[A]	281[A]	306[A]	324[A]	300[A]	294[A]	289[A]	312[A]	298[A]	283[A]	283[A]	281[A]	49.1[A]	12.5[A]	7.36[A]	
16:30 PDT																								6.00[A]
16:30 PST	304[A]	342[A]	336[A]	356[A]	331[A]	285[A]	369[A]	327[A]	314[A]	308[A]	331[A]	304[A]	298[A]	318[A]	291[A]	291[A]	293[A]	254[A]	281[A]	285[A]	46.5[A]	12.9[A]	7.73[A]	
16:45 PDT																								6.66[A]
16:45 PST	348[A]	298[A]	320[A]	304[A]	318[A]	308[A]	364[A]	348[A]	342[A]	318[A]	318[A]	325[A]	318[A]	308[A]	302[A]	312[A]	294[A]	285[A]	279[A]	274[A]	42.3[A]	13.4[A]	8.50[A]	
17:00 PDT																								6.00[A]
17:00 PST	300[A]	325[A]	340[A]	322[A]	325[A]	329[A]	344[A]	310[A]	329[A]	302[A]	306[A]	274[A]	324[A]	270[A]	285[A]	300[A]	310[A]	293[A]	291[A]	278[A]	40.7[A]	13.4[A]	7.73[A]	
17:15 PDT																								6.66[A]

TIME	Feb 15	Feb 16	Feb 17	Feb 18	Feb 19	Feb 20	Feb 21	Feb 22	Feb 23	Feb 24	Feb 25	Feb 26	Feb 27	Feb 28	Mar 1	Mar 2	Mar 3	Mar 4	Mar 5	Mar 6	Mar 7	Mar 8	Mar 9	Mar 10
17:15 PST	327[A]	344[A]	294[A]	344[A]	289[A]	310[A]	344[A]	331[A]	325[A]	320[A]	293[A]	310[A]	314[A]	300[A]	294[A]	314[A]	287[A]	300[A]	283[A]	294[A]	42.3[A]	12.5[A]	7.73[A]	
17:30 PDT																								6.32[A]
17:30 PST	281[A]	306[A]	334[A]	342[A]	329[A]	336[A]	329[A]	329[A]	322[A]	298[A]	310[A]	320[A]	283[A]	296[A]	291[A]	300[A]	285[A]	302[A]	272[A]	258[A]	38.4[A]	13.4[A]	7.73[A]	
17:45 PDT																								6.32[A]
17:45 PST	314[A]	346[A]	348[A]	314[A]	293[A]	320[A]	371[A]	336[A]	340[A]	293[A]	310[A]	293[A]	287[A]	302[A]	304[A]	274[A]	312[A]	293[A]	279[A]	279[A]	35.4[A]	12.1[A]	7.00[A]	
18:00 PDT																								6.00[A]
18:00 PST	331[A]	308[A]	310[A]	318[A]	294[A]	327[A]	371[A]	340[A]	334[A]	291[A]	310[A]	318[A]	302[A]	298[A]	296[A]	285[A]	296[A]	281[A]	289[A]	263[A]	33.9[A]	11.7[A]	7.73[A]	
18:15 PDT																								6.32[A]
18:15 PST	340[A]	320[A]	308[A]	318[A]	316[A]	304[A]	360[A]	320[A]	327[A]	310[A]	334[A]	308[A]	308[A]	294[A]	287[A]	272[A]	312[A]	293[A]	291[A]	287[A]	36.9[A]	12.5[A]	8.50[A]	
18:30 PDT																								6.00[A]
18:30 PST	294[A]	358[A]	308[A]	331[A]	316[A]	334[A]	369[A]	334[A]	314[A]	314[A]	318[A]	329[A]	300[A]	293[A]	300[A]	302[A]	308[A]	298[A]	281[A]	287[A]	32.5[A]	11.7[A]	7.73[A]	
18:45 PDT																								6.00[A]
18:45 PST	346[A]	298[A]	291[A]	296[A]	329[A]	312[A]	381[A]	340[A]	316[A]	314[A]	320[A]	293[A]	324[A]	306[A]	274[A]	285[A]	298[A]	287[A]	281[A]	267[A]	33.9[A]	10.9[A]	8.50[A]	
19:00 PDT																								6.66[A]
19:00 PST	274[A]	310[A]	296[A]	272[A]	352[A]	334[A]	381[A]	336[A]	329[A]	318[A]	289[A]	287[A]	302[A]	298[A]	285[A]	302[A]	293[A]	291[A]	285[A]	279[A]	31.8[A]	11.7[A]	8.11[A]	
19:15 PDT																								5.39[A]
19:15 PST	352[A]	304[A]	312[A]	360[A]	338[A]	342[A]	369[A]	324[A]	329[A]	318[A]	322[A]	310[A]	318[A]	289[A]	283[A]	302[A]	308[A]	279[A]	278[A]	270[A]	31.1[A]	11.3[A]	8.11[A]	
19:30 PDT																								6.00[A]
19:30 PST	324[A]	338[A]	278[A]	352[A]	316[A]	325[A]	371[A]	350[A]	331[A]	308[A]	298[A]	314[A]	310[A]	304[A]	281[A]	283[A]	310[A]	294[A]	281[A]	279[A]	31.1[A]	11.7[A]	8.11[A]	
19:45 PDT																								5.69[A]
19:45 PST	329[A]	316[A]	281[A]	289[A]	302[A]	310[A]	375[A]	329[A]	300[A]	285[A]	350[A]	302[A]	316[A]	310[A]	308[A]	298[A]	300[A]	279[A]	300[A]	256[A]	29.8[A]	11.7[A]	7.73[A]	
20:00 PDT																								6.00[A]
20:00 PST	331[A]	312[A]	329[A]	329[A]	336[A]	338[A]	381[A]	336[A]	334[A]	324[A]	314[A]	293[A]	314[A]	300[A]	265[A]	293[A]	296[A]	291[A]	267[A]	274[A]	27.8[A]	12.1[A]	8.11[A]	
20:15 PDT																								5.39[A]
20:15 PST	287[A]	336[A]	312[A]	329[A]	302[A]	304[A]	403[A]	322[A]	304[A]	302[A]	279[A]	306[A]	304[A]	265[A]	291[A]	312[A]	302[A]	281[A]	279[A]	272[A]	27.2[A]	11.7[A]	7.73[A]	
20:30 PDT																								6.66[A]
20:30 PST	279[A]	312[A]	356[A]	340[A]	302[A]	310[A]	375[A]	340[A]	320[A]	302[A]	291[A]	294[A]	300[A]	278[A]	308[A]	294[A]	304[A]	278[A]	287[A]	289[A]	26.5[A]	11.3[A]	8.11[A]	
20:45 PDT																								5.69[A]
20:45 PST	260[A]	329[A]	356[A]	342[A]	346[A]	327[A]	340[A]	316[A]	296[A]	318[A]	302[A]	306[A]	287[A]	310[A]	314[A]	285[A]	285[A]	289[A]	261[A]	278[A]	25.3[A]	10.9[A]	8.11[A]	
21:00 PDT																								5.39[A]
21:00 PST	308[A]	354[A]	340[A]	320[A]	302[A]	304[A]	397[A]	346[A]	318[A]	296[A]	314[A]	300[A]	291[A]	308[A]	279[A]	298[A]	289[A]	289[A]	289[A]	283[A]	25.9[A]	11.3[A]	7.00[A]	
21:15 PDT																								6.00[A]

TIME	Feb 15	Feb 16	Feb 17	Feb 18	Feb 19	Feb 20	Feb 21	Feb 22	Feb 23	Feb 24	Feb 25	Feb 26	Feb 27	Feb 28	Mar 1	Mar 2	Mar 3	Mar 4	Mar 5	Mar 6	Mar 7	Mar 8	Mar 9	Mar 10
21:15 PST	265[A]	289[A]	390[A]	278[A]	322[A]	329[A]	379[A]	354[A]	338[A]	314[A]	325[A]	310[A]	296[A]	312[A]	302[A]	316[A]	296[A]	300[A]	274[A]	269[A]	22.9[A]	11.7[A]	7.36[A]	
21:30 PDT																								6.00[A]
21:30 PST	325[A]	354[A]	334[A]	338[A]	318[A]	322[A]	401[A]	316[A]	324[A]	314[A]	320[A]	322[A]	302[A]	298[A]	291[A]	272[A]	294[A]	276[A]	289[A]	267[A]	24.1[A]	10.9[A]	7.36[A]	
21:45 PDT																								5.69[A]
21:45 PST	316[A]	318[A]	358[A]	325[A]	302[A]	334[A]	394[A]	342[A]	331[A]	310[A]	320[A]	318[A]	302[A]	310[A]	283[A]	285[A]	302[A]	294[A]	283[A]	278[A]	24.1[A]	10.6[A]	7.73[A]	
22:00 PDT																								6.00[A]
22:00 PST	344[A]	314[A]	386[A]	312[A]	325[A]	325[A]	366[A]	334[A]	298[A]	304[A]	304[A]	320[A]	310[A]	302[A]	291[A]	289[A]	276[A]	291[A]	283[A]	270[A]	22.3[A]	11.7[A]	7.36[A]	
22:15 PDT																								5.39[A]
22:15 PST	296[A]	338[A]	329[A]	342[A]	331[A]	308[A]	419[A]	336[A]	325[A]	314[A]	329[A]	298[A]	300[A]	320[A]	304[A]	291[A]	294[A]	296[A]	278[A]	272[A]	22.3[A]	10.9[A]	7.73[A]	
22:30 PDT																								6.00[A]
22:30 PST	358[A]	344[A]	338[A]	338[A]	336[A]	320[A]	421[A]	336[A]	336[A]	281[A]	320[A]	312[A]	300[A]	293[A]	300[A]	281[A]	293[A]	300[A]	279[A]	278[A]	22.9[A]	10.6[A]	7.36[A]	
22:45 PDT																								6.00[A]
22:45 PST	314[A]	327[A]	366[A]	348[A]	306[A]	327[A]	384[A]	344[A]	312[A]	306[A]	324[A]	314[A]	296[A]	287[A]	308[A]	308[A]	308[A]	291[A]	287[A]	289[A]	22.9[A]	11.7[A]	7.73[A]	
23:00 PDT																								6.00[A]
23:00 PST	348[A]	283[A]	344[A]	329[A]	310[A]	356[A]	403[A]	348[A]	331[A]	314[A]	320[A]	318[A]	316[A]	310[A]	289[A]	249[A]	304[A]	300[A]	274[A]	260[A]	20.7[A]	10.6[A]	7.73[A]	
23:15 PDT																								6.00[A]
23:15 PST	306[A]	308[A]	316[A]	346[A]	308[A]	336[A]	405[A]	331[A]	314[A]	304[A]	331[A]	324[A]	304[A]	306[A]	285[A]	300[A]	300[A]	281[A]	296[A]	287[A]	21.8[A]	10.6[A]	7.73[A]	
23:30 PDT																								5.69[A]
23:30 PST	348[A]	318[A]	364[A]	322[A]	291[A]	329[A]	384[A]	336[A]	306[A]	320[A]	316[A]	285[A]	281[A]	298[A]	274[A]	310[A]	267[A]	287[A]	274[A]	276[A]	20.1[A]	10.9[A]	7.73[A]	
23:45 PDT																								5.69[A]
23:45 PST	322[A]	304[A]	352[A]	306[A]	296[A]	340[A]	340[A]	356[A]	336[A]	304[A]	327[A]	291[A]	324[A]	314[A]	308[A]	287[A]	302[A]	310[A]	281[A]	285[A]	20.7[A]	10.9[A]	7.36[A]	
COUNT	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**96**	**92**
MAX	**358**	**381**	**390**	**377**	**354**	**356**	**421**	**392**	**352**	**350**	**350**	**334**	**336**	**331**	**322**	**322**	**320**	**312**	**306**	**304**	**298**	**20.7**	**10.9**	**7.73**
MIN	**36.9**	**283**	**272**	**272**	**270**	**279**	**322**	**269**	**287**	**281**	**278**	**274**	**281**	**265**	**258**	**249**	**251**	**254**	**261**	**245**	**20.1**	**10.6**	**7.00**	**5.39**

Explanation

A	Approved for publication -- Processing and review completed.

2021

Discharge, cubic feet per second

TIME	Jan 11	Jan 12	Jan 13	Jan 14	Jan 15	Jan 16	Jan 17	Jan 18	Jan 19	Jan 20	Jan 21	Jan 22	Jan 23	Jan 24	Jan 25	Jan 26	Jan 27	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5	Feb 6	Feb 7	Feb 8	Feb 9
00:00 PST	0.00[A]	279[A]	288[A]	283[A]	307[A]	310[A]	309[A]	312[A]	310[A]	310[A]	334[A]	310[A]	256[A]	309[A]	266[A]	265[A]	259[A]	130[A]	123[A]	111[A]	102[A]	97.2[A]	97.2[A]	96.1[A]	97.2[A]	94.0[A]	9.37[A]	3.73[A]	1.60[A]	0.78[A]
00:15 PST	0.00[A]	265[A]	281[A]	288[A]	292[A]	292[A]	318[A]	309[A]	316[A]	314[A]	314[A]	318[A]	252[A]	307[A]	261[A]	266[A]	261[A]	129[A]	126[A]	108[A]	99.4[A]	96.1[A]	98.3[A]	96.1[A]	94.0[A]	98.3[A]	9.73[A]	3.73[A]	1.60[A]	0.78[A]
00:30 PST	0.00[A]	284[A]	297[A]	290[A]	292[A]	301[A]	316[A]	312[A]	307[A]	303[A]	326[A]	330[A]	251[A]	299[A]	263[A]	261[A]	266[A]	130[A]	120[A]	105[A]	101[A]	99.4[A]	102[A]	99.4[A]	96.1[A]	94.0[A]	9.01[A]	3.50[A]	1.60[A]	0.78[A]
00:45 PST	0.00[A]	284[A]	288[A]	288[A]	295[A]	307[A]	301[A]	312[A]	318[A]	301[A]	307[A]	318[A]	249[A]	301[A]	265[A]	263[A]	256[A]	130[A]	126[A]	108[A]	103[A]	97.2[A]	101[A]	99.4[A]	98.3[A]	99.4[A]	9.01[A]	3.50[A]	1.60[A]	0.78[A]
01:00 PST	0.00[A]	263[A]	305[A]	295[A]	301[A]	299[A]	310[A]	310[A]	318[A]	314[A]	330[A]	324[A]	261[A]	297[A]	263[A]	266[A]	259[A]	128[A]	125[A]	107[A]	98.3[A]	101[A]	101[A]	99.4[A]	97.2[A]	94.0[A]	9.01[A]	3.50[A]	1.60[A]	0.78[A]
01:15 PST	0.00[A]	286[A]	274[A]	284[A]	307[A]	294[A]	305[A]	307[A]	301[A]	312[A]	328[A]	310[A]	261[A]	312[A]	261[A]	258[A]	258[A]	124[A]	124[A]	107[A]	103[A]	102[A]	99.4[A]	98.3[A]	92.9[A]	96.1[A]	9.01[A]	3.50[A]	1.60[A]	0.78[A]
01:30 PST	0.00[A]	288[A]	283[A]	290[A]	303[A]	303[A]	309[A]	312[A]	322[A]	307[A]	326[A]	328[A]	263[A]	299[A]	265[A]	268[A]	265[A]	126[A]	124[A]	107[A]	101[A]	98.3[A]	98.3[A]	98.3[A]	98.3[A]	99.4[A]	9.01[A]	3.50[A]	1.60[A]	0.78[A]
01:45 PST	0.00[A]	279[A]	294[A]	288[A]	299[A]	305[A]	312[A]	309[A]	314[A]	322[A]	324[A]	322[A]	258[A]	303[A]	268[A]	259[A]	266[A]	125[A]	126[A]	107[A]	101[A]	99.4[A]	97.2[A]	95.1[A]	101[A]	99.4[A]	9.01[A]	3.29[A]	1.48[A]	0.78[A]
02:00 PST	0.00[A]	274[A]	279[A]	295[A]	295[A]	283[A]	303[A]	309[A]	307[A]	318[A]	328[A]	324[A]	254[A]	305[A]	266[A]	254[A]	265[A]	128[A]	125[A]	104[A]	99.4[A]	97.2[A]	98.3[A]	98.3[A]	98.3[A]	99.4[A]	8.32[A]	3.50[A]	1.60[A]	0.78[A]
02:15 PST	0.00[A]	286[A]	292[A]	310[A]	274[A]	310[A]	303[A]	312[A]	299[A]	322[A]	320[A]	330[A]	254[A]	316[A]	261[A]	256[A]	259[A]	129[A]	126[A]	105[A]	98.3[A]	101[A]	97.2[A]	97.2[A]	101[A]	96.1[A]	8.67[A]	3.50[A]	1.48[A]	0.78[A]
02:30 PST	0.00[A]	297[A]	279[A]	307[A]	301[A]	295[A]	297[A]	310[A]	318[A]	310[A]	326[A]	324[A]	256[A]	301[A]	268[A]	266[A]	254[A]	131[A]	128[A]	104[A]	99.4[A]	98.3[A]	99.4[A]	99.4[A]	97.2[A]	95.1[A]	8.32[A]	3.29[A]	1.48[A]	0.78[A]
02:45 PST	0.00[A]	297[A]	294[A]	294[A]	299[A]	297[A]	307[A]	318[A]	324[A]	320[A]	320[A]	309[A]	259[A]	299[A]	268[A]	268[A]	261[A]	128[A]	129[A]	103[A]	99.4[A]	97.2[A]	97.2[A]	97.2[A]	101[A]	98.3[A]	8.32[A]	3.29[A]	1.48[A]	0.70[A]
03:00 PST	0.00[A]	290[A]	272[A]	295[A]	286[A]	303[A]	316[A]	309[A]	316[A]	312[A]	334[A]	322[A]	261[A]	305[A]	263[A]	261[A]	261[A]	125[A]	133[A]	106[A]	102[A]	101[A]	97.2[A]	97.2[A]	99.4[A]	96.1[A]	7.99[A]	3.29[A]	1.48[A]	0.70[A]
03:15 PST	0.00[A]	279[A]	290[A]	297[A]	301[A]	307[A]	292[A]	307[A]	318[A]	312[A]	326[A]	316[A]	258[A]	310[A]	266[A]	270[A]	265[A]	121[A]	129[A]	103[A]	96.1[A]	101[A]	98.3[A]	97.2[A]	95.1[A]	98.3[A]	7.99[A]	3.29[A]	1.48[A]	0.70[A]
03:30 PST	0.00[A]	292[A]	286[A]	303[A]	299[A]	290[A]	307[A]	301[A]	307[A]	310[A]	324[A]	324[A]	259[A]	307[A]	256[A]	258[A]	259[A]	129[A]	134[A]	105[A]	101[A]	99.4[A]	98.3[A]	102[A]	99.4[A]	99.4[A]	7.99[A]	3.29[A]	1.48[A]	0.70[A]
03:45 PST	0.00[A]	286[A]	288[A]	303[A]	301[A]	290[A]	307[A]	324[A]	312[A]	316[A]	328[A]	334[A]	261[A]	297[A]	266[A]	259[A]	268[A]	129[A]	128[A]	103[A]	99.4[A]	101[A]	99.4[A]	99.4[A]	96.1[A]	96.1[A]	7.99[A]	3.29[A]	1.48[A]	0.70[A]
04:00 PST	0.00[A]	288[A]	281[A]	303[A]	297[A]	303[A]	301[A]	297[A]	310[A]	318[A]	336[A]	310[A]	251[A]	303[A]	261[A]	259[A]	266[A]	126[A]	130[A]	99.4[A]	98.3[A]	98.3[A]	96.1[A]	99.4[A]	101[A]	97.2[A]	7.99[A]	3.29[A]	1.36[A]	0.70[A]
04:15 PST	0.00[A]	294[A]	284[A]	290[A]	294[A]	303[A]	314[A]	303[A]	312[A]	305[A]	324[A]	332[A]	261[A]	309[A]	272[A]	259[A]	259[A]	126[A]	133[A]	102[A]	103[A]	102[A]	99.4[A]	98.3[A]	92.9[A]	94.0[A]	7.99[A]	3.08[A]	1.48[A]	0.70[A]
04:30 PST	0.00[A]	297[A]	284[A]	295[A]	283[A]	292[A]	303[A]	316[A]	314[A]	320[A]	310[A]	320[A]	274[A]	295[A]	265[A]	261[A]	261[A]	125[A]	130[A]	102[A]	99.4[A]	98.3[A]	98.3[A]	97.2[A]	99.4[A]	97.2[A]	7.66[A]	3.29[A]	1.36[A]	0.70[A]
04:45 PST	0.00[A]	294[A]	301[A]	297[A]	277[A]	309[A]	312[A]	310[A]	303[A]	312[A]	324[A]	324[A]	277[A]	299[A]	274[A]	265[A]	263[A]	123[A]	130[A]	104[A]	101[A]	99.4[A]	101[A]	96.1[A]	95.1[A]	97.2[A]	7.34[A]	3.08[A]	1.48[A]	0.70[A]
05:00 PST	0.00[A]	281[A]	277[A]	294[A]	307[A]	305[A]	295[A]	309[A]	314[A]	309[A]	334[A]	322[A]	288[A]	312[A]	258[A]	270[A]	258[A]	121[A]	136[A]	99.4[A]	103[A]	97.2[A]	97.2[A]	101[A]	97.2[A]	99.4[A]	7.66[A]	3.08[A]	1.48[A]	0.70[A]
05:15 PST	0.00[A]	290[A]	301[A]	290[A]	284[A]	297[A]	312[A]	322[A]	309[A]	314[A]	328[A]	320[A]	290[A]	307[A]	263[A]	266[A]	263[A]	125[A]	130[A]	104[A]	101[A]	101[A]	99.4[A]	98.3[A]	98.3[A]	96.1[A]	7.34[A]	3.08[A]	1.36[A]	0.70[A]
05:30 PST	0.00[A]	301[A]	299[A]	303[A]	292[A]	307[A]	294[A]	299[A]	314[A]	316[A]	328[A]	318[A]	290[A]	310[A]	263[A]	263[A]	263[A]	125[A]	131[A]	103[A]	99.4[A]	97.2[A]	97.2[A]	101[A]	94.0[A]	101[A]	7.34[A]	3.08[A]	1.36[A]	0.70[A]
05:45 PST	0.00[A]	301[A]	274[A]	294[A]	299[A]	290[A]	314[A]	307[A]	309[A]	318[A]	320[A]	328[A]	301[A]	309[A]	259[A]	259[A]	259[A]	126[A]	135[A]	103[A]	99.4[A]	102[A]	98.3[A]	97.2[A]	97.2[A]	96.1[A]	7.02[A]	3.08[A]	1.36[A]	0.70[A]
06:00 PST	0.00[A]	294[A]	303[A]	295[A]	297[A]	295[A]	320[A]	310[A]	312[A]	307[A]	332[A]	332[A]	312[A]	318[A]	261[A]	258[A]	270[A]	126[A]	128[A]	102[A]	102[A]	101[A]	97.2[A]	96.1[A]	97.2[A]	97.2[A]	7.02[A]	3.08[A]	1.36[A]	0.70[A]
06:15 PST	0.00[A]	307[A]	283[A]	292[A]	301[A]	309[A]	305[A]	307[A]	310[A]	314[A]	322[A]	332[A]	305[A]	307[A]	270[A]	265[A]	266[A]	128[A]	130[A]	103[A]	99.4[A]	99.4[A]	98.3[A]	95.1[A]	97.2[A]	94.0[A]	7.02[A]	3.08[A]	1.36[A]	0.70[A]
06:30 PST	0.00[A]	297[A]	299[A]	301[A]	290[A]	294[A]	307[A]	303[A]	314[A]	301[A]	318[A]	318[A]	316[A]	307[A]	272[A]	261[A]	268[A]	124[A]	128[A]	102[A]	99.4[A]	101[A]	101[A]	101[A]	97.2[A]	97.2[A]	7.02[A]	3.08[A]	1.36[A]	0.70[A]
06:45 PST	0.00[A]	301[A]	297[A]	299[A]	305[A]	312[A]	299[A]	310[A]	320[A]	328[A]	318[A]	318[A]	312[A]	312[A]	281[A]	263[A]	268[A]	121[A]	131[A]	101[A]	98.3[A]	98.3[A]	99.4[A]	101[A]	96.1[A]	97.2[A]	7.02[A]	2.88[A]	1.36[A]	0.70[A]
07:00 PST	0.00[A]	303[A]	292[A]	292[A]	309[A]	307[A]	305[A]	316[A]	303[A]	307[A]	328[A]	320[A]	316[A]	309[A]	274[A]	259[A]	258[A]	125[A]	128[A]	99.4[A]	99.4[A]	99.4[A]	99.4[A]	98.3[A]	97.2[A]	97.2[A]	7.02[A]	2.88[A]	1.25[A]	0.70[A]
07:15 PST	0.00[A]	314[A]	299[A]	288[A]	286[A]	301[A]	297[A]	312[A]	316[A]	318[A]	328[A]	322[A]	312[A]	299[A]	266[A]	256[A]	256[A]	123[A]	128[A]	101[A]	97.2[A]	98.3[A]	99.4[A]	102[A]	96.1[A]	97.2[A]	7.02[A]	2.88[A]	1.25[A]	0.63[A]
07:30 PST	0.00[A]	301[A]	290[A]	297[A]	295[A]	295[A]	301[A]	312[A]	312[A]	322[A]	332[A]	332[A]	316[A]	299[A]	270[A]	261[A]	261[A]	124[A]	128[A]	103[A]	102[A]	99.4[A]	99.4[A]	97.2[A]	99.4[A]	98.3[A]	6.71[A]	2.88[A]	1.25[A]	0.70[A]
07:45 PST	0.00[A]	303[A]	286[A]	295[A]	299[A]	309[A]	309[A]	316[A]	307[A]	312[A]	316[A]	318[A]	316[A]	307[A]	268[A]	261[A]	261[A]	126[A]	126[A]	103[A]	102[A]	99.4[A]	99.4[A]	98.3[A]	97.2[A]	99.4[A]	6.71[A]	2.88[A]	1.25[A]	0.63[A]
08:00 PST	0.00[A]	299[A]	284[A]	301[A]	292[A]	314[A]	312[A]	305[A]	318[A]	310[A]	334[A]	310[A]	316[A]	314[A]	277[A]	270[A]	258[A]	124[A]	131[A]	102[A]	99.4[A]	98.3[A]	101[A]	99.4[A]	99.4[A]	98.3[A]	6.71[A]	2.88[A]	1.25[A]	0.63[A]
08:15 PST	0.00[A]	307[A]	290[A]	295[A]	292[A]	303[A]	305[A]	318[A]	305[A]	310[A]	330[A]	324[A]	326[A]	318[A]	274[A]	254[A]	259[A]	124[A]	125[A]	98.3[A]	98.3[A]	99.4[A]	101[A]	96.1[A]	97.2[A]	97.2[A]	6.71[A]	2.69[A]	1.25[A]	0.63[A]
08:30 PST	0.00[A]	292[A]	294[A]	288[A]	292[A]	301[A]	297[A]	309[A]	314[A]	322[A]	326[A]	328[A]	312[A]	305[A]	258[A]	263[A]	259[A]	129[A]	126[A]	107[A]	101[A]	102[A]	101[A]	97.2[A]	101[A]	99.4[A]	6.41[A]	2.88[A]	1.25[A]	0.63[A]
08:45 PST	0.00[A]	303[A]	275[A]	288[A]	297[A]	297[A]	297[A]	310[A]	312[A]	310[A]	330[A]	326[A]	309[A]	297[A]	268[A]	263[A]	261[A]	129[A]	125[A]	102[A]	99.4[A]	98.3[A]	96.1[A]	96.1[A]	99.4[A]	97.2[A]	6.41[A]	2.69[A]	1.25[A]	0.63[A]
09:00 PST	0.00[A]	303[A]	281[A]	301[A]	309[A]	295[A]	309[A]	312[A]	314[A]	299[A]	332[A]	322[A]	320[A]	309[A]	263[A]	256[A]	261[A]	124[A]	126[A]	103[A]	101[A]	101[A]	99.4[A]	98.3[A]	99.4[A]	98.3[A]	6.41[A]	2.69[A]	1.25[A]	0.57[A]
09:15 PST	0.00[A]	292[A]	288[A]	284[A]	288[A]	305[A]	297[A]	320[A]	314[A]	316[A]	338[A]	320[A]	314[A]	314[A]	270[A]	263[A]	265[A]	126[A]	123[A]	104[A]	101[A]	99.4[A]	97.2[A]	97.2[A]	98.3[A]	97.2[A]	6.41[A]	2.69[A]	1.25[A]	0.57[A]
09:30 PST	0.00[A]	290[A]	279[A]	294[A]	299[A]	294[A]	310[A]	320[A]	316[A]	314[A]	326[A]	316[A]	310[A]	299[A]	263[A]	258[A]	261[A]	125[A]	130[A]	103[A]	102[A]	98.3[A]	101[A]	94.0[A]	98.3[A]	97.2[A]	6.12[A]	2.69[A]	1.25[A]	0.57[A]

TIME	Jan 11	Jan 12	Jan 13	Jan 14	Jan 15	Jan 16	Jan 17	Jan 18	Jan 19	Jan 20	Jan 21	Jan 22	Jan 23	Jan 24	Jan 25	Jan 26	Jan 27	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5	Feb 6	Feb 7	Feb 8	Feb 9
09:45 PST	0.00[A]	307[A]	299[A]	295[A]	277[A]	312[A]	303[A]	312[A]	310[A]	314[A]	330[A]	322[A]	312[A]	309[A]	263[A]	259[A]	252[A]	123[A]	128[A]	101[A]	101[A]	101[A]	98.3[A]	97.2[A]	95.1[A]	95.1[A]	6.41[A]	2.69[A]	1.25[A]	0.57[A]
10:00 PST	0.00[A]	307[A]	274[A]	307[A]	297[A]	297[A]	301[A]	318[A]	312[A]	310[A]	324[A]	314[A]	314[A]	309[A]	254[A]	274[A]	258[A]	128[A]	125[A]	104[A]	101[A]	99.4[A]	102[A]	96.1[A]	99.4[A]	92.9[A]	6.12[A]	2.69[A]	1.14[A]	0.63[A]
10:15 PST	0.00[A]	314[A]	292[A]	299[A]	288[A]	290[A]	307[A]	307[A]	312[A]	314[A]	326[A]	322[A]	309[A]	312[A]	258[A]	259[A]	265[A]	128[A]	130[A]	103[A]	99.4[A]	97.2[A]	98.3[A]	99.4[A]	95.1[A]	91.8[A]	6.12[A]	2.69[A]	1.14[A]	0.57[A]
10:30 PST	0.00[A]	294[A]	288[A]	301[A]	288[A]	297[A]	309[A]	316[A]	318[A]	324[A]	328[A]	320[A]	301[A]	299[A]	256[A]	254[A]	265[A]	128[A]	130[A]	101[A]	97.2[A]	98.3[A]	99.4[A]	99.4[A]	99.4[A]	80.5[A]	6.12[A]	2.69[A]	1.14[A]	0.57[A]
10:45 PST	0.00[A]	320[A]	275[A]	292[A]	303[A]	301[A]	303[A]	307[A]	314[A]	322[A]	328[A]	303[A]	301[A]	297[A]	270[A]	259[A]	254[A]	126[A]	131[A]	105[A]	98.3[A]	97.2[A]	102[A]	98.3[A]	98.3[A]	70.8[A]	6.12[A]	2.51[A]	1.14[A]	0.57[A]
11:00 PST	0.00[A]	310[A]	288[A]	286[A]	301[A]	286[A]	294[A]	309[A]	310[A]	310[A]	318[A]	275[A]	309[A]	295[A]	265[A]	266[A]	266[A]	125[A]	128[A]	104[A]	99.4[A]	101[A]	102[A]	98.3[A]	96.1[A]	62.6[A]	5.83[A]	2.51[A]	1.14[A]	0.57[A]
11:15 PST	0.00[A]	312[A]	303[A]	288[A]	303[A]	299[A]	316[A]	307[A]	303[A]	316[A]	330[A]	281[A]	305[A]	303[A]	265[A]	258[A]	254[A]	128[A]	130[A]	98.3[A]	98.3[A]	98.3[A]	99.4[A]	97.2[A]	98.3[A]	57.4[A]	5.83[A]	2.51[A]	1.14[A]	0.57[A]
11:30 PST	0.00[A]	305[A]	281[A]	288[A]	295[A]	303[A]	314[A]	307[A]	318[A]	314[A]	322[A]	254[A]	318[A]	297[A]	263[A]	268[A]	258[A]	128[A]	129[A]	103[A]	101[A]	102[A]	101[A]	96.1[A]	95.1[A]	51.6[A]	5.54[A]	2.51[A]	1.14[A]	0.63[A]
11:45 PST	0.00[A]	314[A]	288[A]	305[A]	290[A]	299[A]	301[A]	326[A]	309[A]	316[A]	326[A]	259[A]	309[A]	284[A]	272[A]	252[A]	261[A]	124[A]	130[A]	103[A]	101[A]	96.1[A]	99.4[A]	97.2[A]	95.1[A]	44.5[A]	5.54[A]	2.51[A]	1.14[A]	0.57[A]
12:00 PST	0.00[A]	297[A]	292[A]	297[A]	303[A]	297[A]	312[A]	322[A]	316[A]	314[A]	314[A]	263[A]	314[A]	279[A]	265[A]	265[A]	261[A]	125[A]	129[A]	102[A]	101[A]	102[A]	95.1[A]	99.4[A]	95.1[A]	41.6[A]	5.83[A]	2.51[A]	1.14[A]	0.63[A]
12:15 PST	0.00[A]	312[A]	297[A]	283[A]	294[A]	295[A]	288[A]	318[A]	303[A]	324[A]	330[A]	266[A]	307[A]	265[A]	275[A]	263[A]	275[A]	125[A]	126[A]	102[A]	101[A]	97.2[A]	97.2[A]	97.2[A]	96.1[A]	38.0[A]	5.83[A]	2.51[A]	1.14[A]	0.63[A]
12:30 PST	0.00[A]	305[A]	295[A]	297[A]	303[A]	307[A]	318[A]	316[A]	307[A]	326[A]	324[A]	265[A]	295[A]	284[A]	275[A]	259[A]	268[A]	125[A]	128[A]	103[A]	98.3[A]	102[A]	98.3[A]	98.3[A]	99.4[A]	35.9[A]	5.54[A]	2.51[A]	1.14[A]	0.63[A]
12:45 PST	0.00[A]	312[A]	286[A]	275[A]	299[A]	303[A]	305[A]	310[A]	312[A]	309[A]	336[A]	259[A]	309[A]	265[A]	277[A]	254[A]	268[A]	125[A]	125[A]	102[A]	97.2[A]	101[A]	101[A]	101[A]	96.1[A]	32.6[A]	5.54[A]	2.34[A]	1.14[A]	0.63[A]
13:00 PST	0.00[A]	314[A]	294[A]	286[A]	303[A]	297[A]	305[A]	314[A]	316[A]	318[A]	324[A]	258[A]	299[A]	261[A]	274[A]	258[A]	266[A]	125[A]	126[A]	103[A]	102[A]	98.3[A]	97.2[A]	99.4[A]	98.3[A]	32.0[A]	5.54[A]	2.34[A]	1.14[A]	0.63[A]
13:15 PST	0.00[A]	303[A]	283[A]	294[A]	310[A]	297[A]	288[A]	312[A]	305[A]	307[A]	328[A]	254[A]	320[A]	268[A]	275[A]	261[A]	268[A]	128[A]	131[A]	102[A]	99.4[A]	101[A]	97.2[A]	98.3[A]	99.4[A]	30.1[A]	5.54[A]	2.34[A]	1.14[A]	0.63[A]
13:30 PST	0.00[A]	312[A]	305[A]	297[A]	292[A]	305[A]	312[A]	305[A]	309[A]	320[A]	322[A]	265[A]	301[A]	266[A]	274[A]	256[A]	268[A]	128[A]	128[A]	105[A]	95.1[A]	99.4[A]	97.2[A]	92.9[A]	97.2[A]	28.2[A]	5.27[A]	2.34[A]	1.14[A]	0.63[A]
13:45 PST	0.00[A]	307[A]	299[A]	294[A]	288[A]	292[A]	314[A]	312[A]	309[A]	314[A]	326[A]	251[A]	316[A]	268[A]	272[A]	259[A]	272[A]	125[A]	128[A]	99.4[A]	99.4[A]	98.3[A]	99.4[A]	98.3[A]	95.1[A]	26.4[A]	5.27[A]	2.34[A]	1.25[A]	0.63[A]
14:00 PST	0.00[A]	309[A]	281[A]	288[A]	299[A]	299[A]	305[A]	301[A]	314[A]	312[A]	322[A]	259[A]	312[A]	275[A]	274[A]	261[A]	265[A]	121[A]	129[A]	102[A]	103[A]	99.4[A]	101[A]	102[A]	99.4[A]	25.8[A]	5.27[A]	2.34[A]	1.04[A]	0.63[A]
14:15 PST	0.00[A]	303[A]	299[A]	294[A]	307[A]	301[A]	292[A]	310[A]	316[A]	314[A]	322[A]	256[A]	316[A]	266[A]	268[A]	268[A]	256[A]	125[A]	126[A]	103[A]	98.3[A]	98.3[A]	98.3[A]	101[A]	99.4[A]	25.3[A]	5.27[A]	2.18[A]	1.04[A]	0.63[A]
14:30 PST	0.00[A]	301[A]	305[A]	286[A]	303[A]	301[A]	310[A]	318[A]	305[A]	316[A]	318[A]	254[A]	322[A]	272[A]	266[A]	254[A]	266[A]	126[A]	129[A]	102[A]	101[A]	101[A]	98.3[A]	97.2[A]	94.0[A]	24.7[A]	5.00[A]	2.34[A]	1.04[A]	0.63[A]
14:45 PST	0.00[A]	322[A]	281[A]	294[A]	309[A]	316[A]	309[A]	307[A]	307[A]	309[A]	316[A]	254[A]	307[A]	266[A]	266[A]	261[A]	265[A]	121[A]	128[A]	99.4[A]	102[A]	102[A]	96.1[A]	96.1[A]	99.4[A]	22.5[A]	5.27[A]	2.34[A]	1.04[A]	0.63[A]
15:00 PST	0.00[A]	310[A]	295[A]	309[A]	309[A]	305[A]	305[A]	307[A]	312[A]	320[A]	338[A]	258[A]	322[A]	261[A]	268[A]	268[A]	265[A]	126[A]	131[A]	101[A]	102[A]	101[A]	97.2[A]	97.2[A]	99.4[A]	23.0[A]	5.27[A]	2.18[A]	1.04[A]	0.63[A]
15:15 PST	0.00[A]	312[A]	301[A]	305[A]	297[A]	295[A]	303[A]	312[A]	307[A]	312[A]	324[A]	261[A]	318[A]	265[A]	268[A]	265[A]	268[A]	125[A]	133[A]	99.4[A]	101[A]	99.4[A]	97.2[A]	99.4[A]	95.1[A]	21.9[A]	5.00[A]	2.18[A]	1.04[A]	0.57[A]
15:30 PST	0.00[A]	303[A]	295[A]	286[A]	301[A]	297[A]	320[A]	303[A]	310[A]	316[A]	324[A]	249[A]	324[A]	265[A]	263[A]	266[A]	256[A]	125[A]	126[A]	105[A]	102[A]	98.3[A]	97.2[A]	98.3[A]	99.4[A]	20.9[A]	5.00[A]	2.18[A]	1.14[A]	0.57[A]
15:45 PST	0.00[A]	314[A]	292[A]	299[A]	288[A]	297[A]	297[A]	312[A]	316[A]	314[A]	330[A]	254[A]	312[A]	263[A]	268[A]	268[A]	270[A]	123[A]	133[A]	99.4[A]	96.1[A]	97.2[A]	99.4[A]	98.3[A]	95.1[A]	19.8[A]	5.00[A]	2.18[A]	1.14[A]	0.57[A]
16:00 PST	0.00[A]	305[A]	292[A]	297[A]	305[A]	309[A]	316[A]	312[A]	303[A]	316[A]	324[A]	254[A]	310[A]	266[A]	258[A]	265[A]	268[A]	123[A]	136[A]	103[A]	98.3[A]	98.3[A]	96.1[A]	98.3[A]	98.3[A]	19.3[A]	5.00[A]	2.02[A]	1.14[A]	0.57[A]
16:15 PST	0.00[A]	290[A]	290[A]	299[A]	305[A]	301[A]	316[A]	320[A]	305[A]	310[A]	324[A]	256[A]	322[A]	274[A]	270[A]	263[A]	272[A]	125[A]	134[A]	101[A]	101[A]	98.3[A]	95.1[A]	99.4[A]	95.1[A]	18.3[A]	5.00[A]	2.02[A]	1.04[A]	0.57[A]
16:30 PST	0.00[A]	286[A]	297[A]	295[A]	286[A]	292[A]	297[A]	316[A]	307[A]	309[A]	328[A]	252[A]	324[A]	265[A]	266[A]	268[A]	265[A]	125[A]	131[A]	97.2[A]	98.3[A]	102[A]	97.2[A]	101[A]	98.3[A]	18.3[A]	4.72[A]	2.02[A]	0.95[A]	0.50[A]
16:45 PST	0.00[A]	290[A]	294[A]	297[A]	309[A]	303[A]	309[A]	312[A]	320[A]	305[A]	332[A]	263[A]	314[A]	263[A]	263[A]	261[A]	258[A]	126[A]	133[A]	104[A]	99.4[A]	102[A]	99.4[A]	98.3[A]	97.2[A]	17.3[A]	4.72[A]	2.02[A]	0.95[A]	0.57[A]
17:00 PST	48.4[A]	295[A]	281[A]	303[A]	305[A]	299[A]	299[A]	322[A]	314[A]	324[A]	320[A]	251[A]	322[A]	261[A]	265[A]	265[A]	261[A]	125[A]	135[A]	103[A]	102[A]	102[A]	99.4[A]	97.2[A]	98.3[A]	16.9[A]	4.72[A]	2.02[A]	0.95[A]	0.57[A]
17:15 PST	94.0[A]	286[A]	294[A]	312[A]	310[A]	310[A]	314[A]	309[A]	288[A]	322[A]	324[A]	256[A]	326[A]	259[A]	261[A]	266[A]	275[A]	129[A]	130[A]	103[A]	99.4[A]	101[A]	97.2[A]	96.1[A]	97.2[A]	16.9[A]	4.72[A]	2.02[A]	0.95[A]	0.50[A]
17:30 PST	148[A]	275[A]	307[A]	307[A]	288[A]	290[A]	309[A]	318[A]	314[A]	318[A]	322[A]	258[A]	314[A]	254[A]	268[A]	274[A]	268[A]	119[A]	125[A]	102[A]	102[A]	99.4[A]	98.3[A]	97.2[A]	97.2[A]	16.4[A]	4.72[A]	2.02[A]	0.95[A]	0.57[A]
17:45 PST	179[A]	294[A]	286[A]	286[A]	307[A]	286[A]	316[A]	314[A]	309[A]	320[A]	318[A]	259[A]	303[A]	270[A]	259[A]	265[A]	259[A]	125[A]	120[A]	105[A]	101[A]	99.4[A]	99.4[A]	98.3[A]	97.2[A]	15.9[A]	4.46[A]	2.02[A]	0.95[A]	0.50[A]
18:00 PST	200[A]	275[A]	297[A]	297[A]	301[A]	307[A]	310[A]	318[A]	314[A]	316[A]	324[A]	249[A]	301[A]	261[A]	268[A]	263[A]	261[A]	123[A]	114[A]	102[A]	98.3[A]	92.9[A]	99.4[A]	98.3[A]	99.4[A]	15.5[A]	4.46[A]	2.02[A]	0.95[A]	0.50[A]
18:15 PST	210[A]	286[A]	284[A]	295[A]	303[A]	307[A]	316[A]	309[A]	316[A]	320[A]	316[A]	261[A]	312[A]	265[A]	261[A]	265[A]	266[A]	129[A]	117[A]	102[A]	98.3[A]	98.3[A]	99.4[A]	98.3[A]	98.3[A]	15.0[A]	4.46[A]	1.88[A]	0.86[A]	0.50[A]
18:30 PST	232[A]	279[A]	290[A]	309[A]	312[A]	305[A]	305[A]	309[A]	309[A]	309[A]	318[A]	261[A]	322[A]	270[A]	263[A]	263[A]	252[A]	129[A]	115[A]	102[A]	103[A]	101[A]	98.3[A]	96.1[A]	94.0[A]	14.6[A]	4.46[A]	1.88[A]	0.95[A]	0.50[A]
18:45 PST	229[A]	279[A]	299[A]	301[A]	286[A]	301[A]	310[A]	318[A]	301[A]	312[A]	326[A]	251[A]	310[A]	259[A]	266[A]	258[A]	224[A]	128[A]	113[A]	104[A]	101[A]	101[A]	96.1[A]	98.3[A]	92.9[A]	14.6[A]	4.46[A]	1.88[A]	0.95[A]	0.50[A]
19:00 PST	234[A]	295[A]	294[A]	303[A]	297[A]	301[A]	303[A]	295[A]	316[A]	314[A]	322[A]	258[A]	318[A]	270[A]	266[A]	259[A]	182[A]	129[A]	112[A]	99.4[A]	101[A]	96.1[A]	98.3[A]	101[A]	101[A]	13.7[A]	4.46[A]	1.88[A]	0.86[A]	0.50[A]
19:15 PST	246[A]	277[A]	294[A]	297[A]	307[A]	294[A]	316[A]	316[A]	314[A]	297[A]	322[A]	254[A]	305[A]	263[A]	263[A]	261[A]	156[A]	121[A]	112[A]	102[A]	102[A]	98.3[A]	97.2[A]	96.1[A]	97.2[A]	13.7[A]	4.21[A]	1.88[A]	0.86[A]	0.50[A]
19:30 PST	235[A]	274[A]	277[A]	301[A]	294[A]	307[A]	301[A]	303[A]	316[A]	316[A]	326[A]	256[A]	312[A]	261[A]	263[A]	252[A]	150[A]	125[A]	108[A]	102[A]	101[A]	99.4[A]	99.4[A]	98.3[A]	99.4[A]	13.3[A]	4.21[A]	1.88[A]	0.86[A]	0.50[A]

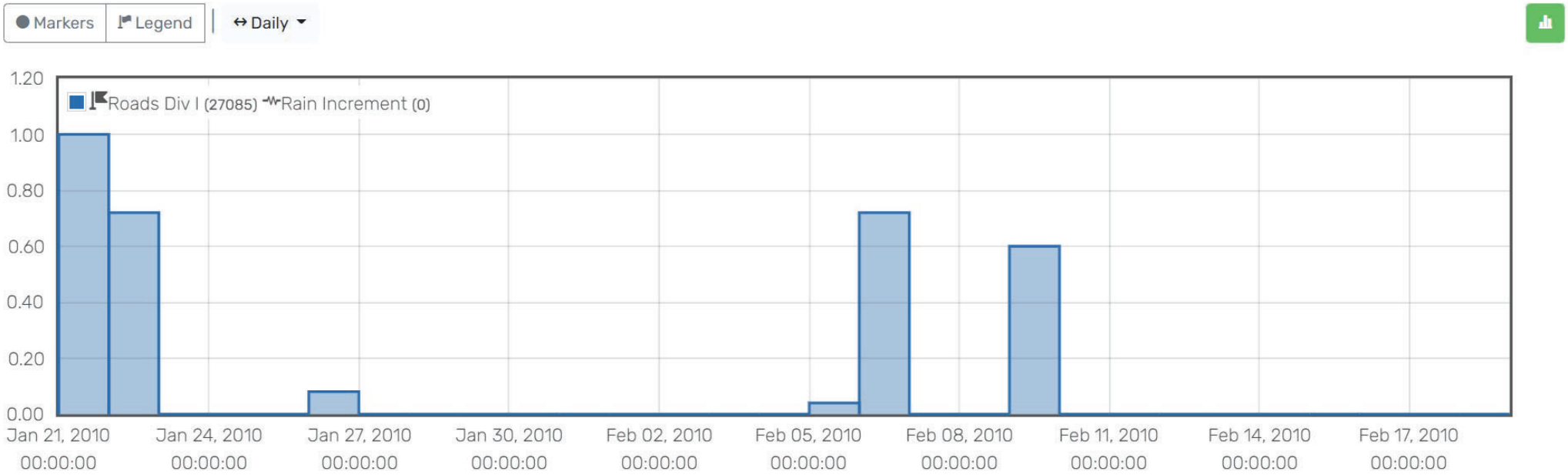
TIME	Jan 11	Jan 12	Jan 13	Jan 14	Jan 15	Jan 16	Jan 17	Jan 18	Jan 19	Jan 20	Jan 21	Jan 22	Jan 23	Jan 24	Jan 25	Jan 26	Jan 27	Jan 28	Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4	Feb 5	Feb 6	Feb 7	Feb 8	Feb 9
19:45 PST	252[A]	288[A]	295[A]	307[A]	297[A]	294[A]	316[A]	318[A]	318[A]	312[A]	318[A]	258[A]	309[A]	258[A]	266[A]	265[A]	138[A]	124[A]	106[A]	104[A]	99.4[A]	99.4[A]	98.3[A]	99.4[A]	97.2[A]	12.9[A]	4.21[A]	1.88[A]	0.86[A]	0.45[A]
20:00 PST	242[A]	272[A]	299[A]	284[A]	274[A]	295[A]	303[A]	310[A]	312[A]	309[A]	324[A]	261[A]	307[A]	263[A]	263[A]	261[A]	136[A]	123[A]	107[A]	99.4[A]	101[A]	98.3[A]	97.2[A]	97.2[A]	96.1[A]	12.9[A]	4.21[A]	1.88[A]	0.86[A]	0.45[A]
20:15 PST	256[A]	297[A]	294[A]	303[A]	284[A]	309[A]	301[A]	318[A]	312[A]	309[A]	322[A]	251[A]	314[A]	266[A]	246[A]	270[A]	134[A]	123[A]	107[A]	104[A]	97.2[A]	98.3[A]	95.1[A]	101[A]	97.2[A]	12.4[A]	3.96[A]	1.74[A]	0.86[A]	0.45[A]
20:30 PST	256[A]	275[A]	294[A]	307[A]	297[A]	301[A]	314[A]	312[A]	318[A]	314[A]	326[A]	259[A]	303[A]	266[A]	258[A]	261[A]	135[A]	125[A]	106[A]	103[A]	102[A]	98.3[A]	99.4[A]	97.2[A]	97.2[A]	12.4[A]	4.21[A]	1.74[A]	0.86[A]	0.45[A]
20:45 PST	252[A]	286[A]	299[A]	297[A]	294[A]	301[A]	292[A]	318[A]	312[A]	312[A]	326[A]	251[A]	307[A]	266[A]	266[A]	263[A]	135[A]	123[A]	110[A]	96.1[A]	95.1[A]	101[A]	99.4[A]	96.1[A]	97.2[A]	12.0[A]	3.96[A]	1.74[A]	0.86[A]	0.45[A]
21:00 PST	247[A]	295[A]	294[A]	294[A]	297[A]	299[A]	316[A]	324[A]	316[A]	310[A]	330[A]	258[A]	307[A]	261[A]	259[A]	263[A]	135[A]	124[A]	113[A]	103[A]	101[A]	98.3[A]	96.1[A]	97.2[A]	96.1[A]	12.0[A]	3.96[A]	1.74[A]	0.86[A]	0.45[A]
21:15 PST	246[A]	286[A]	295[A]	284[A]	295[A]	322[A]	281[A]	307[A]	322[A]	303[A]	326[A]	258[A]	309[A]	268[A]	265[A]	266[A]	136[A]	125[A]	113[A]	95.1[A]	101[A]	98.3[A]	97.2[A]	95.1[A]	97.2[A]	11.2[A]	3.96[A]	1.74[A]	0.86[A]	0.45[A]
21:30 PST	256[A]	283[A]	294[A]	290[A]	305[A]	297[A]	316[A]	316[A]	322[A]	301[A]	324[A]	258[A]	305[A]	261[A]	266[A]	268[A]	125[A]	123[A]	111[A]	98.3[A]	91.8[A]	101[A]	97.2[A]	94.0[A]	97.2[A]	11.2[A]	3.96[A]	1.74[A]	0.86[A]	0.45[A]
21:45 PST	265[A]	284[A]	299[A]	299[A]	299[A]	299[A]	309[A]	312[A]	316[A]	309[A]	322[A]	254[A]	295[A]	268[A]	265[A]	254[A]	133[A]	124[A]	112[A]	102[A]	98.3[A]	98.3[A]	97.2[A]	96.1[A]	97.2[A]	11.2[A]	3.96[A]	1.74[A]	0.78[A]	0.45[A]
22:00 PST	259[A]	284[A]	274[A]	274[A]	314[A]	305[A]	307[A]	312[A]	303[A]	310[A]	320[A]	249[A]	310[A]	265[A]	272[A]	265[A]	133[A]	125[A]	113[A]	102[A]	103[A]	98.3[A]	99.4[A]	95.1[A]	95.1[A]	10.5[A]	3.96[A]	1.74[A]	0.86[A]	0.45[A]
22:15 PST	274[A]	292[A]	295[A]	305[A]	301[A]	286[A]	310[A]	324[A]	324[A]	309[A]	332[A]	256[A]	310[A]	265[A]	261[A]	256[A]	131[A]	123[A]	111[A]	96.1[A]	91.8[A]	96.1[A]	99.4[A]	96.1[A]	92.9[A]	10.9[A]	3.96[A]	1.60[A]	0.78[A]	0.45[A]
22:30 PST	270[A]	281[A]	274[A]	292[A]	307[A]	297[A]	305[A]	324[A]	324[A]	307[A]	324[A]	254[A]	299[A]	268[A]	261[A]	261[A]	133[A]	126[A]	119[A]	103[A]	101[A]	102[A]	91.8[A]	99.4[A]	97.2[A]	10.5[A]	3.96[A]	1.74[A]	0.78[A]	0.45[A]
22:45 PST	277[A]	294[A]	290[A]	295[A]	307[A]	290[A]	316[A]	312[A]	318[A]	303[A]	330[A]	256[A]	314[A]	256[A]	265[A]	259[A]	126[A]	123[A]	118[A]	101[A]	101[A]	99.4[A]	97.2[A]	97.2[A]	98.3[A]	10.5[A]	3.73[A]	1.60[A]	0.78[A]	0.40[A]
23:00 PST	254[A]	295[A]	303[A]	275[A]	281[A]	307[A]	309[A]	316[A]	309[A]	290[A]	330[A]	247[A]	312[A]	263[A]	268[A]	259[A]	131[A]	123[A]	117[A]	97.2[A]	98.3[A]	97.2[A]	96.1[A]	98.3[A]	97.2[A]	10.1[A]	3.73[A]	1.60[A]	0.78[A]	0.45[A]
23:15 PST	275[A]	292[A]	295[A]	299[A]	299[A]	294[A]	309[A]	312[A]	318[A]	312[A]	318[A]	252[A]	303[A]	263[A]	258[A]	258[A]	129[A]	120[A]	111[A]	103[A]	98.3[A]	99.4[A]	98.3[A]	98.3[A]	98.3[A]	9.73[A]	3.73[A]	1.60[A]	0.78[A]	0.45[A]
23:30 PST	272[A]	286[A]	305[A]	283[A]	305[A]	286[A]	303[A]	316[A]	299[A]	312[A]	332[A]	247[A]	309[A]	268[A]	266[A]	263[A]	126[A]	125[A]	112[A]	103[A]	98.3[A]	98.3[A]	101[A]	96.1[A]	96.1[A]	9.73[A]	3.73[A]	1.60[A]	0.78[A]	0.40[A]
23:45 PST	270[A]	281[A]	294[A]	288[A]	303[A]	310[A]	318[A]	322[A]	299[A]	324[A]	318[A]	263[A]	305[A]	266[A]	266[A]	266[A]	129[A]	125[A]	112[A]	101[A]	101[A]	99.4[A]	96.1[A]	95.1[A]	94.0[A]	10.1[A]	3.73[A]	1.60[A]	0.78[A]	0.45[A]
COUNT	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96
MAX	277	322	307	312	314	322	320	326	324	328	338	334	326	318	281	274	275	131	136	111	103	102	102	102	101	101	9.73	3.73	1.60	0.78
MIN	0.00	263	272	274	274	283	281	295	288	290	307	247	249	254	246	252	125	119	106	95.1	91.8	92.9	91.8	92.9	92.9	9.73	3.73	1.60	0.78	0.40

Explanation

A	Approved for publication -- Processing and review completed.

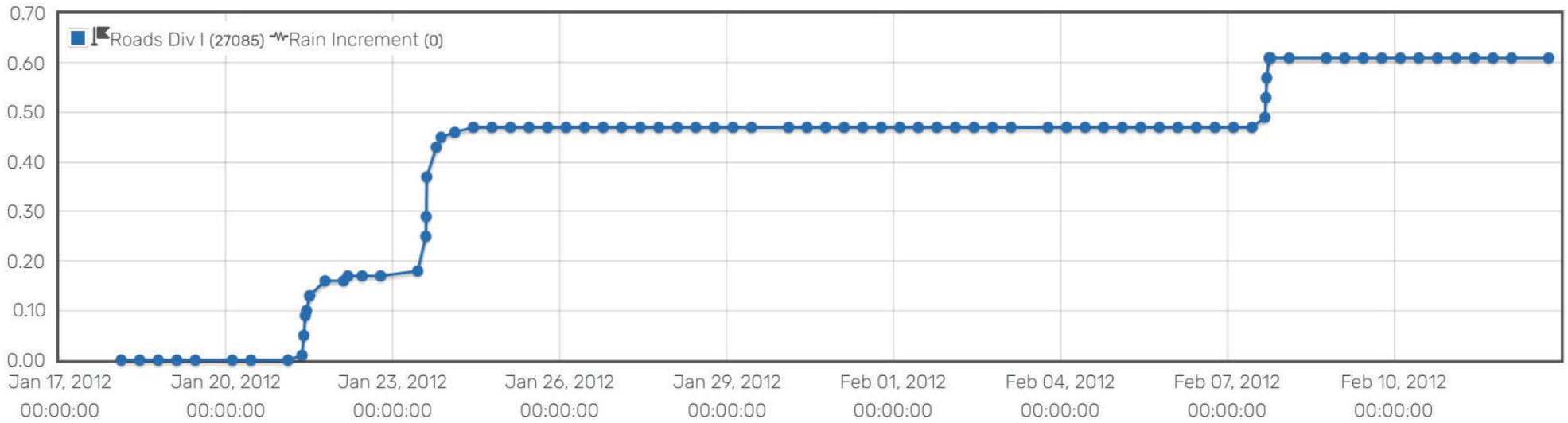
County of San Diego Roads Division 1 Rain Gage Records

21 January, 2010 - 18 February, 2010

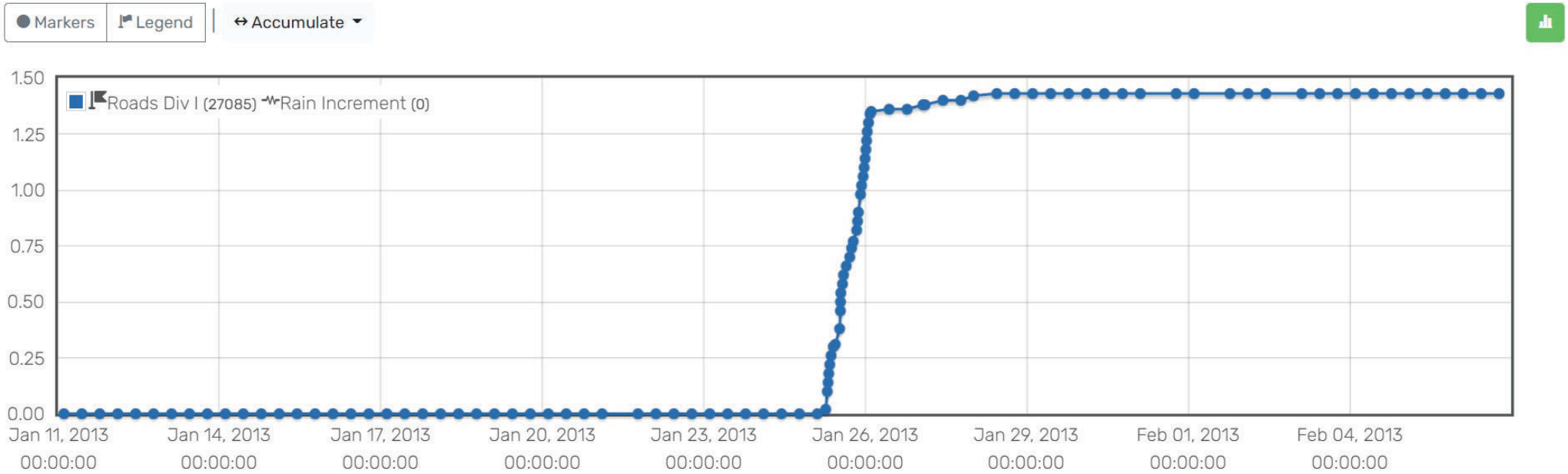


17 January, 2012 - 12 February, 2012

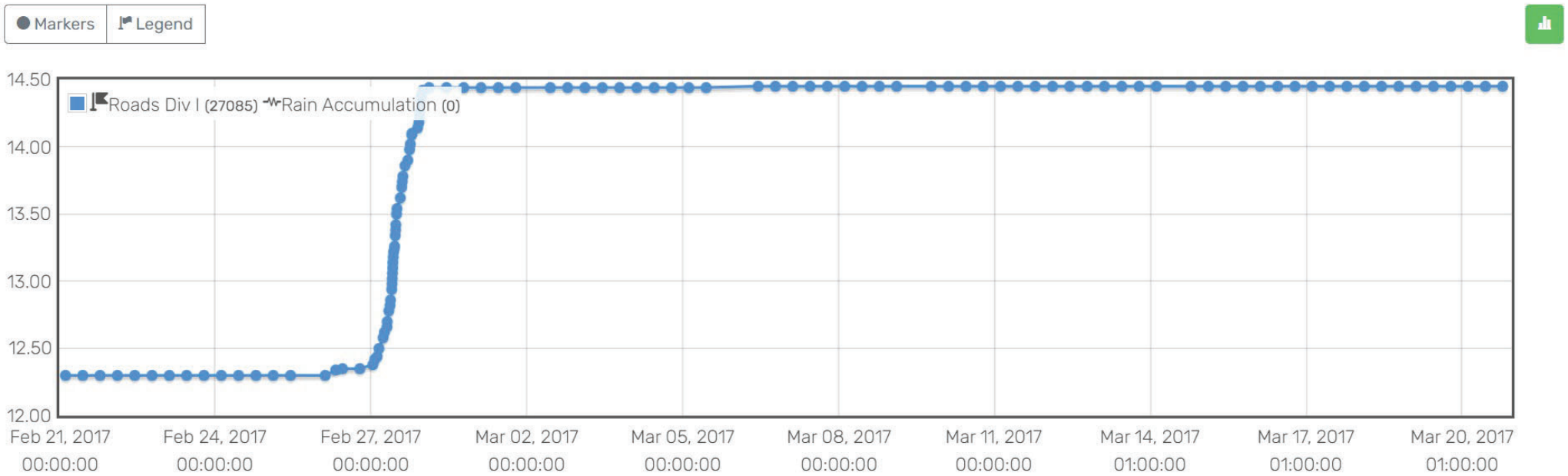
Markers | Legend | ↔ Accumulate



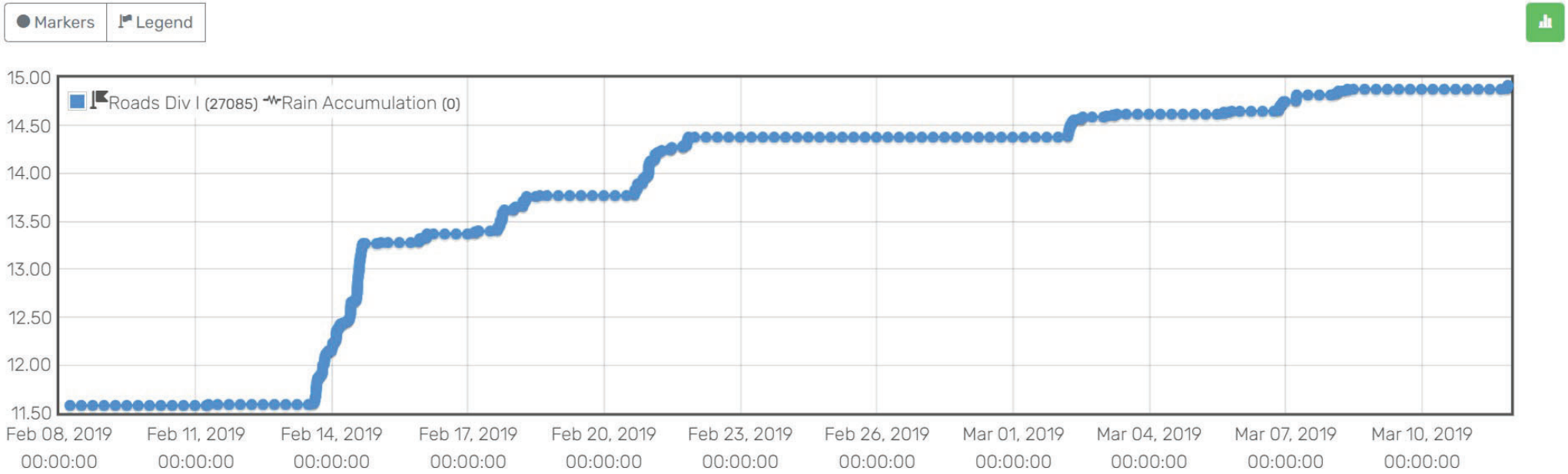
11 January, 2013 - 06 February, 2013



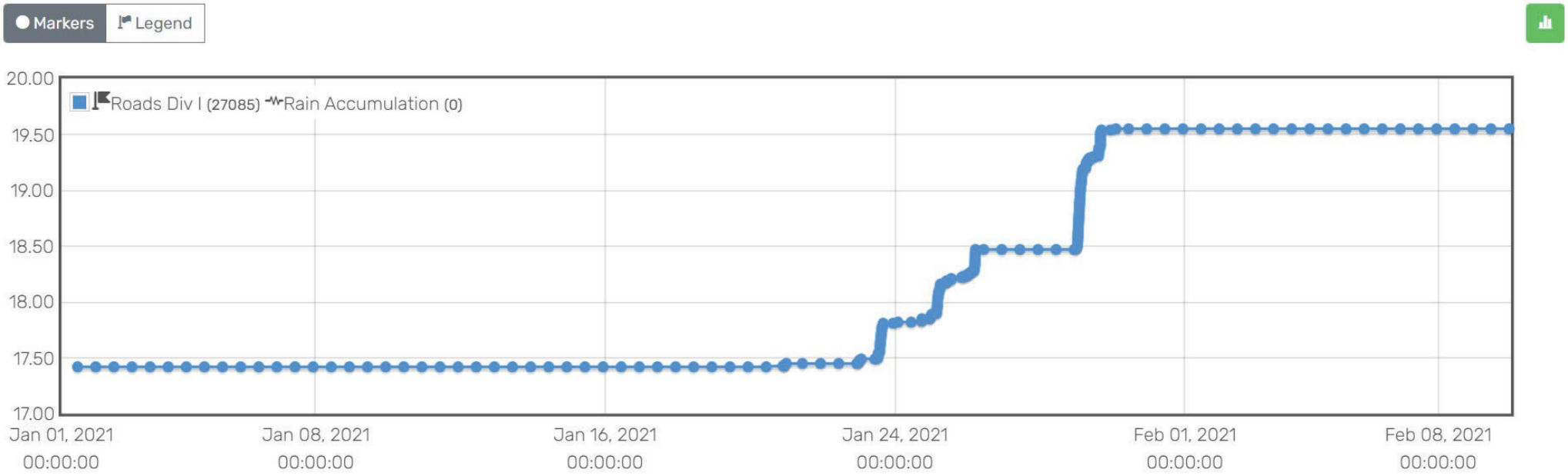
21 February, 2017 - 20 March, 2017



08 February, 2019 - 11 March, 2019



01 January, 2021 - 09 February, 2021



Worksheet for 25' Trapezoidal Channel Capacity

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.0053 ft/ft
Normal Depth	3.5 ft
Left Side Slope	3.0 H:V
Right Side Slope	2.0 H:V
Bottom Width	25.00 ft

Results	
Discharge	618.1 cfs
Flow Area	118.1 ft²
Wetted Perimeter	43.9 ft
Hydraulic Radius	2.7 ft
Top Width	42.50 ft
Critical Depth	2.4 ft
Critical Slope	0.0190 ft/ft
Velocity	5.23 ft/s
Velocity Head	0.43 ft
Specific Energy	3.93 ft
Froude Number	0.553
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 ft
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	3.5 ft
Critical Depth	2.4 ft
Channel Slope	0.0053 ft/ft
Critical Slope	0.0190 ft/ft

Worksheet for 50' Trapezoidal Channel Capacity

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.0022 ft/ft
Normal Depth	3.5 ft
Left Side Slope	3.0 H:V
Right Side Slope	3.0 H:V
Bottom Width	50.00 ft

Results	
Discharge	756.4 cfs
Flow Area	211.8 ft²
Wetted Perimeter	72.1 ft
Hydraulic Radius	2.9 ft
Top Width	71.00 ft
Critical Depth	1.9 ft
Critical Slope	0.0199 ft/ft
Velocity	3.57 ft/s
Velocity Head	0.20 ft
Specific Energy	3.70 ft
Froude Number	0.365
Flow Type	Subcritical

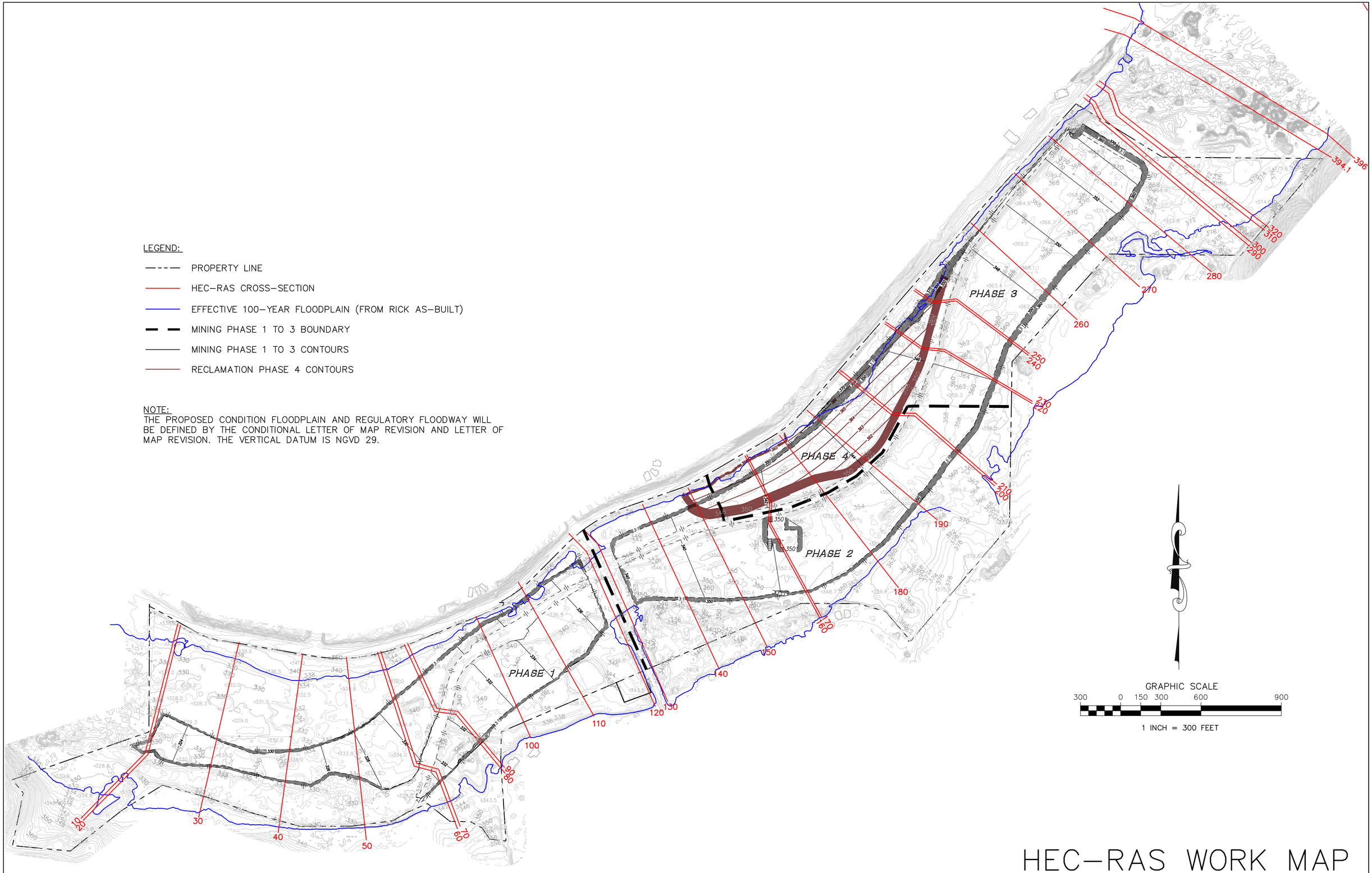
GVF Input Data	
Downstream Depth	0.0 ft
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	3.5 ft
Critical Depth	1.9 ft
Channel Slope	0.0022 ft/ft
Critical Slope	0.0199 ft/ft

LEGEND:

- PROPERTY LINE
- HEC–RAS CROSS–SECTION
- EFFECTIVE 100–YEAR FLOODPLAIN (FROM RICK AS–BUILT)
- MINING PHASE 1 TO 3 BOUNDARY
- MINING PHASE 1 TO 3 CONTOURS
- RECLAMATION PHASE 4 CONTOURS

NOTE:
THE PROPOSED CONDITION FLOODPLAIN AND REGULATORY FLOODWAY WILL BE DEFINED BY THE CONDITIONAL LETTER OF MAP REVISION AND LETTER OF MAP REVISION. THE VERTICAL DATUM IS NGVD 29.



GRAPHIC SCALE

300 0 150 300 600 900

1 INCH = 300 FEET

HEC–RAS WORK MAP

Attachment F

Conditions of Approval & CEQA Mitigation Measures (To Be Included Upon Final Approval)