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Pages 18 and 19: Background map is 1918 map drawn by L. Tanner. Southern Paiute basket weaver Mary Ann Pepo at Moapa in 1940 by Arthur Rothstein.

Page 20: Background map is 1918 map drawn by L. Tanner.

Page 21: Moapa Paiute House, William R. Palmer Collection, Special Collections, Southern Utah University. Las Vegas Paiute Encampment 1900 by Sadie Kiel George and in the private collection of Elizabeth v.T. Warren. Warm Springs Ranch 1941 station wagon "Woodie," donated by Ann W. Funk to the Nevada State Museum.

Page 27: Vermilion flycatcher, Pablo Lèautaud (shared under a Creative Commons license for non-commercial use at www.flickr.com/photos/pleautaud/913191344/in/set-72157603757048983/).

Page 28: From left to right. Common buckeye on sunflower, Bruce Lund. Old world swallowtail, Bruce Lund.

Page 33: Moapa dace illustrations by Joseph R. Tomelleri.

Page 38: Virgin River chub, Brandon Albrecht.

Page 40: Western yellow-billed cuckoo, US Bureau of Reclamation. Southwestern Willow Flycatcher, US Bureau of Reclamation. Summer tanager, Jerry Oldenettel (shared under a Creative Commons license for non-commercial use at www.flickr.com/photos/jroldenettel/2146321428/). Western yellow bat, Allen Calvert.

Page 43: Yuma clapper rail, Joe Kahl. Red-winged blackbirds, Bruce Lund.

Page 44: Vermilion flycatcher, Doug Greenberg (shared under a Creative Commons license for non-commercial use at www.flickr.com/photos/dagberg/2020944801/).

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Page 54: Metate, HRA, Inc. Conservation Archeology Staff. Arrowheads, HRA, Inc. Conservation Archeology Staff.

Page 51: GLO Plat, Government Land Office Plat surveyed September 1881.

All other photos by SNWA staff and Lucchesi Galati.

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- A.01** SNPLMA NOMINATION
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THE PROCESS

The Secretary of the Department of Interior approved funding to acquire the Warm Springs Natural Area under Round 6 of the SNPLMA "Park, Trails and Natural Area" category.

- **October 2005** – SNWA submitted an application under Round 6 of the Southern Nevada Public Land Management Act (SNPLMA) to acquire the Warm Springs Ranch under the "Park, Trails and Natural Area" category.
- **February 7, 2006** - the Secretary of the Department of Interior approved SNWA's request for funding to acquire Warm Springs Ranch.
- **July 20, 2006** - SNWA Board of Directors approved an agreement between South Fifteen, LLC, Sunburst Properties, LLC, Pay Dace, LLC, and SNWA for the acquisition of the Warm Springs Ranch by SNWA and authorized the General Manager to negotiate and execute the agreement and documents necessary to effectuate the transfer.
- **May 16, 2007** - The Financial Assistance Agreement between SNWA and the United States Department of Interior Bureau of Land Management (BLM) was signed. SNWA was awarded funding to purchase the property and committed to manage it as a Natural Area.
- **September 13, 2007** – Purchase of the Warm Springs Ranch was finalized and SNWA renamed the property "Warm Springs Natural Area".

A.01 SNPLMA NOMINATION

Financial Assistance Agreement

SNWA signed the Southern Nevada Public Land Management Act (SNPLMA) Financial Assistance Agreement (FAA) with the United States Department of Interior Bureau of Land Management on May 16, 2007 to purchase the property under the "Parks, Trails and Natural Area" category. The following are key excerpts from the FAA:

Section I. "Statement of Joint Objectives"

A. PURPOSE

This Agreement is made and entered into by the Department of the Interior, Bureau of Land Management (BLM), Nevada State Office for the Las Vegas Field Office, and the Southern Nevada Water Authority, through implementation of the Southern Nevada Public Land Management Act, for the purpose of developing parks, trails, and natural areas in Clark and Lincoln County, Nevada.

B. OBJECTIVE

Cooperation between BLM and Clark County in order to facilitate the construction of the Warm Springs Ranch Acquisition for Development of a Natural Area. The property will be acquired as a Parks, Trails, and Natural Area (PTNA) acquisition with the objective to develop a natural area under the PTNA category in a future round. Totalling approximately 1179 acres this property is located in the upper Muddy River Valley approximately 7 miles northwest of the Town of Moapa and borders the Moapa Valley National Wildlife Refuge.

There is approximately 3.8 miles of Muddy River and tributary frontage and substantial wetland and riparian habitat. The natural area will provide controlled public access to enjoy the abundant natural resources, will include interpretation of the resources and T&E species located on the site, and will include measures to preserve and protect those resources. Natural Resources on the Property include, aquatic habitat for the Virgin River Roundtail Chub, the endemic Moapa Dace (listed), the Southwestern Willow Flycatcher, and the Yellow-Billed Cuckoo. The property includes Nevada's largest breeding population of Vermilion Flycatcher. Within this section of the Muddy River reside pockets of native Mesquite Bosque and Cottonwood-Willow riparian habitat.

Section II. "Definitions"

Section III. "Project Management"

A. THE RECIPIENT (SNWA) AGREES TO:

- 1. Accomplish the stated Objective of the Project as approved by the Secretary of the Interior or as otherwise modified.*
- 2. Adhere to the policies and procedures identified in the IA.*
- 3. Furnish qualified personnel for the coordination, oversight, and performance of the objective for the Project.*
- 4. Provide supervision for the Project to include responsibility for all technical aspects, development, implementation, scheduling, safety, coordination, and other Project needs.*

- 5. Make certain necessary permits or environmental clearances are obtained.*
- 6. Own and maintain in perpetuity any land, buildings, trails, facilities, or other features improved or constructed, unless a shorter period is specifically stated in a separate project nomination authorized through the approval by the Secretary of the Interior.*

B. THE BLM AGREES TO:

- 1. Provide coordination and assistance during all phases of Project development, including, but not limited to providing guidance regarding SNPLMA policies and procedures.*
- 2. Conduct Project inspections and meet with Project staff to confirm project progress and assist in achieving objectives for this Project*
- 3. Facilitate and coordinate the processing of funding, to include amendments to this Agreement.*
- 4. Adhere to the policies and procedures identified in the IA.*
- 5. Recipient's submitted documents are incorporated by reference: Project Proposal entitled Warm Springs Ranch Acquisition for Development of a Natural Area, as approved by the Secretary of the Interior on February 7, 2006, SF 424, Application for Federal Assistance, SF 424A, Budget Information - Non-Construction Programs, SF 424B, Assurances - Non-Construction Programs, SF424B, Assurances - Non-Construction Programs, DI-2010 and Appendix B-6 Estimated Necessary Expenses & Key Milestone Dates.*

Nomination by the Secretary of the Interior

The following are excerpts from the SNPLMA Special Account Nomination Round 6 to the Secretary of the Department of Interior for the purchase of the Warm Springs Ranch (Warm Springs Natural Area).

Project: Warm Springs Ranch Acquisition

A. *The Southern Nevada Water Authority (SNWA) proposes to acquire and manage 1,179 acres of privately held property along the upper Muddy River, also referred to as the Warm Springs Ranch as a natural area under the PTNA category. This property is the single most ecologically significant privately held property along the Muddy River. The property is approximately seven miles northwest of the Town of Moapa in Clark County, Nevada. The property is bordered by State Route 168 to the north, Warm Springs Loop Road to the south and the Moapa National Wildlife Refuge to south and west (see attached map). The property is bisected by approximately 3.8 miles of the Muddy River. The acquisition will address the potential need to acquire water rights for sustainability of the natural area. It will also address acquisition of mineral and mining rights, including any that may be held by third parties, to ensure that the resources within the natural area will not be subject to damage or destruction from mining operations.*

Upon acquisition of the Warm Springs Ranch property, the SNWA will work cooperatively with stakeholders to implement a series of management and conservation actions. Principle among these may include:

- *Development of educational and recreational area/trails emphasizing the natural resources for public use consistent with the Moapa National Wildlife Refuge and other adjacent lands*
- *Invasive plant management*
- *Invasive fish and invertebrate management*
- *Bank and channel stabilization activities*
- *Construction and/or enhancement of wetlands*
- *Restoration and/or enhancement of riparian and upland habitat*
- *Spring pool restoration/enhancement*

B. *The SNWA will be responsible for the operation, maintenance and management of the property over the long-term as a natural area under the PTNA category. However it is anticipated that this will be accomplished cooperatively with other stakeholders.*

C.1. *The acquisition of this property will place in public ownership one of the most biologically and culturally significant properties in Southern Nevada. In addition to the significant benefits to species and habitat that would accrue from acquisition and restoration of the property, the Warm Springs Ranch also provides an opportunity to reconnect the local community*

with the resources and values of the Muddy River region. By creating opportunities for appropriate, low-impact public access, as well as the tremendous opportunities that would come from the potential to establish the property as a field research station, the educational opportunities are endless.

C.2. *Acquisition of the property by the SNWA would place the property in public trust in perpetuity.*

C.3. *Once acquired, the SNWA has committed to working with all relevant stakeholders (including, but not limited to, The Nature Conservancy, Clark County, U.S. Fish and Wildlife Service, U.S. Bureau of Land Management, Nevada Division of Wildlife, Town of Moapa, etc.) to determine how the property should be improved and managed for the long-term benefit of the species and habitat within the context of a natural area under the PTNA category.*

C.4. *Acquisition of the property will increase the opportunity to acquire funding and engage in collaborative joint management of the property.*

Acquisition of this property is considered as one of the highest priority action items for conservation in southern Nevada by Clark County, U.S. Fish and Wildlife Service, U.S. Bureau of Land Management, Red Rock Audubon Society and The Nature Conservancy.

Property Deed

The Deed for the Warm Springs Natural Area was signed on August 31, 2007 and recorded on September 13, 2007. In it, the Warm Springs Ranch and 16 other parcels were conveyed to the Southern Nevada Water Authority (Grantee) from the following Grantors: South Fifteen, LLC; Sunburst Properties LLC; Dace 2 Fish, LLC; Moapa Express, LLC; Pay Dace, LLC; and TNES, LLC. The following is an excerpt from the Property Deed:

THE GRANT & CONVEYANCE HEREUNDER IS EXPRESSLY SUBJECT TO A RESTRICTION & COVENANT RUNNING WITH THE LAND:

IT IS EXPRESSLY UNDERSTOOD AND AGREED that the conveyance of the Land described herein to the GRANTEE, SOUTHERN NEVADA WATER AUTHORITY, a political subdivision of the State of Nevada, is made for the benefit of the people of the State of Nevada for the exclusive use as a public park, trail, or natural area under Section 4(e)(3)(A)(iv) of the federal Southern Nevada Public Land Management Act of 1998, Public Law 105-263, 112 Stat. 2343, as amended. If the Land described herein is not used or ceases to be used as a public park, trail, or natural area within ninety-nine (99) years from the date of this conveyance, any person or entity may enforce the terms of this use restriction in a court of competent jurisdiction.

A.02 SENSITIVE SPECIES TABLE

28 Sensitive Species on WSNA				
Common Name	Scientific Name	USFWS	NNHP State Status	Footnotes
Fish				
1 Moapa White River springfish	<i>Crenichthys baileyi moapae</i>		critically imperiled in state	4,6,8
2 Virgin River chub	<i>Gila seminuda (Muddy River Population)</i>		globally - critically imperiled	4,5,6,8
3 Moapa dace	<i>Moapa coriacea</i>	Endangered	critically imperiled in state	1,4,5,6,8
4 Moapa speckled dace	<i>Rhinichthys osculus moapae</i>		critically imperiled in state	4,5,6,8
Invertebrates				
5 Western naucorid	<i>Ambrysus mormon</i>			7
6 Warm Springs crawling water beetle	<i>Haliplus eremicus</i>		not ranked	4
7 MacNeill sooty wing skipper	<i>Hesperopsis graciellae</i>		critically imperiled in state	4,5,6
8 Moapa naucorid	<i>Limnocoris moapensis</i>		critically imperiled in state	4,7,8
9 Moapa riffle beetle	<i>Microcyloepus moapus</i>		critically imperiled in state	4,5,7
10 Pahrnagat naucorid	<i>Pelocoris biimpessus shoshone</i>			4,7
11 Moapa pebblesnail	<i>Pyrgulopsis avernalis</i>	petitioned for listing	imperiled in state due to rarity	4,7,8
12 Moapa Valley pyrg	<i>Pyrgulopsis carinifera</i>	petitioned for listing	critically imperiled in state	4,7
13 Moapa skater	<i>Rhagovelia becki</i>			7
14 Moapa Warm Springs riffle beetle	<i>Stenelmis moapa</i>		critically imperiled in state	4,5,7,8
15 Grated tryonia	<i>Tryonia clathrata</i>	petitioned for listing	imperiled in state due to rarity	4,7,8
Birds				
16 Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	Candidate	globally - vulnerable to decline	3,4,5,6
17 Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered	critically imperiled in state	1,4,5,6
18 Phainopepla	<i>Phainopepla nitens</i>		imperiled in state due to rarity	4,5,6
19 Vermilion flycatcher	<i>Pyrocephalus rubinus</i>			6
20 Summer tanager	<i>Piranga rubra</i>			6
Bats				
21 Townsend's big-eared bat	<i>Corynorhinus townsendii</i>		imperiled in state due to rarity	4,5,6
22 Spotted bat	<i>Euderma maculatum</i>		imperiled in state due to rarity	4,5,6
23 Western red bat	<i>Lasiurus blossevillii</i>		critically imperiled in state	4,5
24 Western yellow bat	<i>Lasiurus xanthinus</i>		critically imperiled in state	4
25 California leaf-nosed bat	<i>Macrotus californicus</i>		imperiled in state due to rarity	4,5,6
26 Fringed myotis	<i>Myotis thysanodes</i>		imperiled in state due to rarity	4,5,6
27 Big free-tailed bat	<i>Nyctinomops macrotis</i>		imperiled in state due to rarity	4,5,6
Reptiles				
28 Desert tortoise	<i>Gopherus agassizii</i>	Threatened	vulnerable to decline	2,4,5,6

FOOTNOTES:

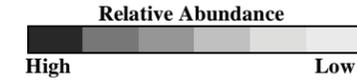
- 1 Listed as Endangered under the Endangered Species Act
- 2 Listed as Threatened under the Endangered Species Act
- 3 Candidate species under the Endangered Species Act
- 4 State of Nevada Department of Conservation & Natural Resources. 2009

- 5 Bureau of Land Management - Nevada Special Status Species
- 6 Clark County Multiple Species Habitat Conservation Plan (MSHCP). 2000
- 7 Muddy River Headwaters Macroinvertebrate Report - Albrecht et al. 2008
- 8 U.S. Department of the Interior Fish and Wildlife Service. 1996. Recovery plan for the rare aquatic species of the Muddy River ecosystem

A.03 RESOURCE INVENTORIES

Resource Inventories for WSNA				
Data	Completed	Survey Frequency	Source	Data Collection Methodology
Property Ownership				
ALTA survey	yes	once	SNWA	ALTA survey standard
Site Geography				
Aerial photo coverage	yes	biannual	SNWA	Aerial photography
LiDAR elevation	yes	once	SNWA	Laser altimetry
Soil survey	yes	once	NRCS	
Hydrological features	ongoing	progressive	SNWA	Multiple methods
Cultural Resources				
Class I archeological survey	yes	once	HRA Inc.	Literature search
Class III archeological survey	yes	once	HRA Inc.	30 m. transects, total coverage
Biological Resources				
Moapa dace survey	yes	biannual	SNWA, USGS, NDOW, USFWS	Snorkel survey - reach
Aquatic invertebrate survey	yes	5 years	Bio-West Inc.	D-frame kick net - reach segment
Small mammal survey	partial	5 years	SNWA	Sherman live trap - transect
Floral inventory	yes	10 years	SNWA	Observation
Lepidoptera	yes	5 years	BOR	Observation, netting
Hymenoptera survey	partial	10 years	BOR	observation, pan trapping
Bird survey	yes	annually	SNWA, GBBO, NDOW	GBBO transect, intensive area surveys, breeding bird census; Christmas bird count
Herpetological survey	no	5 years	SNWA	Observation, pitfall arrays

PRELIMINARY CHECKLIST OF MONTHLY RELATIVE ABUNDANCE OF BIRDS ON THE WARM SPRINGS NATURAL AREA



SPECIES*	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Cassin's Vireo												
Red-eyed Vireo												
Warbling Vireo												
Shrikes												
Loggerhead Shrike												
Northern Shrike												
Waxwings and Silky-Flycatchers												
Phainopepla												
Cedar Waxwing												
Thrushes												
Varied Thrush												
Western Bluebird												
Mountain Bluebird												
Townsend's Solitaire												
American Robin												
Mockingbirds and Thrashers												
Northern Mockingbird												
Sage Thrasher												
Crissal Thrasher												
Starlings												
European Starling												
Nuthatches and Creepers												
White-breasted Nuthatch												
Brown Creeper												
Wrens												
Cactus Wren												
Rock Wren												
Marsh Wren												
Bewick's Wren												
Winter Wren												
House Wren												
Gnatcatchers and Bushtits												
Verdin												
Blue-gray Gnatcatcher												
Black-tailed Gnatcatcher												
Bushtit												
Swallows												
Tree Swallow												
Violet-green Swallow												
Northern Rough-winged Swallow												
Barn Swallow												
Cliff Swallow												
Kinglets, Chickadees												
Ruby-crowned Kinglet												
Golden-crowned Kinglet												
Mountain Chickadee												
Larks												
Horned Lark												
Old World Sparrows												
House Sparrow												
Wagtails and Pipits												
American Pipit												
Siskins, Crossbills, and Allies												
Pine Siskin												
American Goldfinch												
Lesser Goldfinch												
Cassin's Finch												
House Finch												
Evening Grosbeak												
New World Warblers												
Orange-crowned Warbler												
Nashville Warbler												
Virginia's Warbler												
Lucy's Warbler												
Northern Parula												
Yellow Warbler												
Yellow-rumped Warbler												
Black-throated Gray Warbler												

SPECIES*	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Townsend's Warbler												
Hermit Warbler												
Black-and-White Warbler												
American Redstart												
Worm-eating Warbler												
MacGillivray's Warbler												
Common Yellowthroat												
Wilson's Warbler												
Yellow-breasted Chat												
Buntings, Sparrows, Tanagers, Allies												
Song Sparrow												
Lincoln's Sparrow												
Swamp Sparrow												
White-crowned Sparrow												
Dark-eyed Junco												
Savannah Sparrow												
Baird's Sparrow												
Chipping Sparrow												
Brewer's Sparrow												
Vesper Sparrow												
Lark Sparrow												
Black-throated Sparrow												
Sage Sparrow												
Green-tailed Towhee												
Spotted Towhee												
Abert's Towhee												
Hepatic Tanager												
Summer Tanager												
Western Tanager												
Rose-breasted Grosbeak												
Black-headed Grosbeak												
Blue Grosbeak												
Lazuli Bunting												
Indigo Bunting												
Blackbirds, Grackles, and Orioles												
Hooded Oriole												
Bullock's Oriole												
Orchard Oriole												
Scott's Oriole												
Yellow-headed Blackbird												
Red-winged Blackbird												
Western Meadowlark												
Great-tailed Grackle												
Brewer's Blackbird												
Brown-headed Cowbird												

* This checklist was compiled by GBBO using the Nevada Bird Atlas, Nevada Bird Count point count transects, two area search plots, and grid inventory/rapid area searches (April through June, and September 2009), as well as a checklist provided by Bruce Lund, containing the results of his birding on the property between 1998 and 2007.

Based on limited data; the Eurasian Collared-Dove was not recorded during the 1998-2007 time period but has been prevalent 2008-2009; however, winter surveys have not yet been completed on the property.

Footnotes:

- (1) Species names in **bold** indicate that they are confirmed or probable breeders. However, not all birds breeding on the property may be highlighted, since each year of surveys produces breeding evidence for new species.
- (2) The relative abundance of a species in a particular month is indicated by the shading (white indicates no records, black indicates high relative abundance). There are not specific numbers or densities attached to these because much of the non-breeding data was from Lund's checklist which has uncertain effort/standardization for each month.

A.05 FLORAL INVENTORY

Floral Inventory: Warm Springs Natural Area

Prepared by: Robert L. Johnson PhD, Southern Nevada Water Authority, May 2011

Family	Scientific Name Common Name	Author	Family	Scientific Name Common Name	Author
Amaranthaceae	<i>Amaranthus retroflexus</i> Redroot amaranth	L.	Asteraceae	<i>Conyza canadensis</i> Canadian horseweed	(L.) Cronquist var. glabrata (A. Gray) Cronquist
Amaranthaceae	<i>Tidestromia oblongifolia</i> Arizona honeysweet	(S. Watson) Standl.	Asteraceae	<i>Encelia farinosa</i> Brittlebush	A. Gray ex Torr
Apiaceae	<i>Apium graveolens</i> Wild celery	L.	Asteraceae	<i>Geraea canescens</i> Hairy desertsunflower	Torr. & A. Gray
Apiaceae	<i>Berula erecta</i> Cut-leaf water-parsnip	(Hudson) Cov	Asteraceae	<i>Geraea canescens</i> Hairy desertsunflower	Torr. & A. Gray
Apiaceae	<i>Cicuta maculata</i> Water-hemlock	L.	Asteraceae	<i>Gutierrezia sarothrae</i> Broom snakeweed	(Pursh) Britton & Rusby
Apiaceae	<i>Hydrocotyle verticillata</i> Whorled marshpennywort	Thunb.	Asteraceae	<i>Helianthus annuus</i> Common sunflower	L.
Apocynaceae	<i>Apocynum cannabinum</i> Indianhemp	L.	Asteraceae	<i>Isocoma acradenia</i> Alkali goldenbush	(Greene) Greene
Apocynaceae	<i>Nerium oleander</i> Oleander	L.	Asteraceae	<i>Lactuca serriola</i> Prickly lettuce	L.
Arecaceae	<i>Washingtonia filifera</i> California fan palm	(Linden ex André) H. Wendl.	Asteraceae	<i>Laennecia coulteri</i> Coulter's horseweed	(A. Gray) G.L. Nesom
Asteraceae	<i>Acroptilon repens</i> Hardheads, Russian knapweed	(L.) DC.	Asteraceae	<i>Palafoxia arida</i> Desert palafox	B.L. Turner & Morris
Asteraceae	<i>Ambrosia dumosa</i> Burrobush	(A. Gray) Payne	Asteraceae	<i>Pluchea odorata</i> Sweetcent	(L.) Cass.
Asteraceae	<i>Ambrosia eriocentra</i> Woolly fruit bur ragweed	(A. Gray) Payne	Asteraceae	<i>Pluchea sericea</i> Arrowweed	(Nutt.) Coville
Asteraceae	<i>Ambrosia salsola var. salsola</i> Burrobrush	(Torrey & A. Gray) Strother & B. G. Baldwin	Asteraceae	<i>Psathyrotes pilifera</i> Hairybeast turtleback	A. Gray
Asteraceae	<i>Amphipappus fremontii ssp. fremontii</i> Fremont's chaffbush	Torr. & A. Gray ex A. Gray	Asteraceae	<i>Psathyrotes ramosissima</i> Velvet turtleback	(Torr.) A. Gray
Asteraceae	<i>Antheropeas lanosum</i> White easterbonnets	(A. Gray) Rydb.	Asteraceae	<i>Psilostrophe cooperi</i> Whitestem paperflower	(A. Gray) Greene
Asteraceae	<i>Atrichoseris platyphylla</i> Parachute plant	(A. Gray) A. Gray	Asteraceae	<i>Rafinesquia neomexicana</i> New Mexico plumeseed	A. Gray
Asteraceae	<i>Baccharis emoryi</i> Emory's baccharis	A. Gray	Asteraceae	<i>Solidago spectabilis</i> Nevada goldenrod	(D.C. Eaton) A. Gray var. confinis (A. Gray) Cronquist
Asteraceae	<i>Baccharis salicifolia</i> Mule-fat	(Ruiz & Pav.) Pers.	Asteraceae	<i>Sonchus asper</i> Spiny sowthistle	(L.) Hill
Asteraceae	<i>Baileya multiradiata</i> Desert marigold	Harv. & A. Gray ex A. Gray	Asteraceae	<i>Sonchus oleraceus</i> Common sowthistle	L.
Asteraceae	<i>Bebbia juncea</i> Sweetbush	(Benth.) Greene	Asteraceae	<i>Stephanomeria pauciflora</i> Brownplume wirelettuce	(Torr.) A. Nelson
Asteraceae	<i>Centaurea melitensis</i> Maltese star-thistle	L.	Asteraceae	<i>Stylocline micropoides</i> Woollyhead neststraw	A. Gray
Asteraceae	<i>Chaenactis carphoclinia</i> Pebble pincushion	A. Gray	Asteraceae	<i>Symphotrichum divaricatum</i> Southern annual saltmarsh aster	(Nutt.) G.L. Nesom
Asteraceae	<i>Chloracantha spinosa</i> Spiny chloracantha	(Benth.) G.L. Nesom	Asteraceae	<i>Xanthium strumarium</i> Rough cocklebur	L.
Asteraceae	<i>Cirsium mohavense</i> Mojave thistle	(Greene) Petr.	Asteraceae	<i>Xylorhiza tortifolia var. tortifolia</i> Mojave woodyaster	(Torr. & A. Gray) Greene
			Boraginaceae	<i>Amsinckia menziesii var. intermedia</i> Common fiddleneck	(Lehm.) A. Nelson & J.F. Macbr. var. (Fisch. & C.A. Mey.) Ganders

Family	Scientific Name Common Name	Author
Boraginaceae	Amsinckia tessellata Bristly fiddleneck	A. Gray
Boraginaceae	Cryptantha angustifolia Narrowleaf cryptantha	(Torr.) Greene
Boraginaceae	Cryptantha barbiger Bearded cryptantha	(A. Gray) Greene
Boraginaceae	Cryptantha gracilis Narrowstem cryptantha	Osterh.
Boraginaceae	Cryptantha nevadensis Nevada cryptantha	Nelson & Greene
Boraginaceae	Cryptantha pterocarya var. cycloptera Wingnut cryptantha	(Torr.) Greene var. (Greene) J.F. Macbr.
Boraginaceae	Cryptantha recurvata Recurved cryptantha	Cov
Boraginaceae	Cryptantha utahensis Scented cryptantha	(A. Gray) Greene
Boraginaceae	Heliotropium curassavicum Salt heliotrope	L.
Boraginaceae	Pectocarya platycarpa Broadfruit combseed	Munz & I.M. Johnston.) Munz & I.M. Johnston.
Boraginaceae	Pectocarya recurvata Curvenut combseed	I. M. Johnston
Boraginaceae	Plagiobothrys jonesii Jone's popcornflower	A. Gray
Brassicaceae	Brassica tournefortii Sahara mustard	Gouan
Brassicaceae	Chorispora tenella Crossflower, Muskmustard	(Pall.) DC.
Brassicaceae	Descurainia pinnata ssp. Glabra Western tansymustard	(Walter) Britton ssp. (Woot. & Standl.) Detling
Brassicaceae	Guillenia lasiophylla California mustard	(Hook. & Arn.) Greene
Brassicaceae	Lepidium fremontii Desert pepperweed	S. Watson
Brassicaceae	Lepidium lasiocarpum var. lasiocarpum Shaggyfruit pepperweed	Nutt.
Brassicaceae	Lepidium latifolium Broadleaved pepperweed	L.
Brassicaceae	Malcolmia africana African mustard	R. Br.
Brassicaceae	Physaria tenella Moapa bladderpod	(A. Nelson) O'Kane & Al-Shehbaz
Brassicaceae	Rapistrum rugosum Annual bastardcabbage	(L.) All.
Brassicaceae	Sisymbrium irio London rocket	L.
Brassicaceae	Sisymbrium orientale Indian hedgemustard	L.
Brassicaceae	Thelypodium integrifolium ssp. affine Entireleaved thelypody	(Nutt.) Endl. ex Walp ssp. (Greene) Al-Shehbaz
Cactaceae	Cylindropuntia bigelovii Teddybear cholla	(Engelm.) F.M. Knuth

Family	Scientific Name Common Name	Author
Cactaceae	Cylindropuntia echinocarpa Wiggins' cholla	(Engelm. & Bigelow) F.M. Knuth
Cactaceae	Cylindropuntia ramosissima Branched pencil cholla	(Engelm.) F.M. Knuth
Cactaceae	Echinocactus polycephalus Cottontop cactus	Engelm. & Bigelow
Cactaceae	Echinocereus engelmannii Engelmann's hedgehog cactus	(Parry ex Engelm.) Lem.
Cactaceae	Echinomastus johnsonii Johnson's fishhook cactus	(Parry ex Engelm.) E.M. Baxter
Cactaceae	Ferocactus cylindraceus Lecote's barrel cactus	(Engelm.) Orcutt var. lecontei (Engelm.) H. Bravo
Cactaceae	Mammillaria tetrancistra Common fishhook cactus	Engelm.
Cactaceae	Opuntia basilaris Beavertail pricklypear	Engelm. & Bigelow
Cactaceae	Opuntia polyacantha var. erinacea Grizzlybear pricklypear	Haw. var. (Engelm. & Bigelow ex Engelm.) Parfitt
Campanulaceae	Nemacladus glanduliferus Glandular threadplant	Jeps.
Caryophyllaceae	Spergularia salina Salt sandspurry	J. Presl & C. Presl
Chenopodiaceae	Allenrolfea occidentalis Iodine bush	(S. Watson) Kuntze
Chenopodiaceae	Atriplex confertifolia Shadscale saltbush	(Torr. & Frém.) S. Watson
Chenopodiaceae	Atriplex elegans var. elegans Wheelscale	(Moq.) D. Dietr
Chenopodiaceae	Atriplex hymenelytra Desertholly	(Torr.) S. Watson
Chenopodiaceae	Atriplex lentiformis Big saltbush, Quailbush	(Torr.) S. Watson
Chenopodiaceae	Atriplex polycarpa Cattle saltbush	(Torr.) S. Watson
Chenopodiaceae	Atriplex semibaccata Australian saltbrush	R. Br.
Chenopodiaceae	Bassia hyssopifolia Fivehorn smotherweed	(Pall.) Kuntz
Chenopodiaceae	Monolepis nuttalliana Nuttall's povertyweed	(Schult.) Greene
Chenopodiaceae	Nitrophila occidentalis Boraxweed	(Moq.) S. Watson
Chenopodiaceae	Salsola tragus Prickly Russian thistle	L.
Chenopodiaceae	Suaeda calceoliformis Pursh seepweed	(Hook.) Moq.
Chenopodiaceae	Suaeda moquinii Mojave seablite	(Torr.) Greene
Convolvulaceae	Calystegia sepium Hedge false bindweed	(L.) R. Br.
Convolvulaceae	Convolvulus arvensis Field bindweed	L.

Family	Scientific Name Common Name	Author
Cuscutaceae	Cuscuta californica Chaparral dodder	Hook. & Arn.
Cuscutaceae	Cuscuta indecora Bigseed alfalfa dodder	Choisy
Cuscutaceae	Cuscuta pentagona Fiveangled dodder	Engelm.
Cuscutaceae	Cuscuta salina var. major Goldenthread	Engelm. var. Yunck.
Cyperaceae	Carex nebrascensis Nebraska sedge	Dewey
Cyperaceae	Carex praegracilis Clustered field sedge	W. Boott
Cyperaceae	Cladium californicum California sawgrass	(S. Watson) O'Neill
Cyperaceae	Cyperus odoratus Fragrant sedge	L.
Cyperaceae	Cyperus strigosus Strawcolored flatsedge	L.
Cyperaceae	Eleocharis macrostachya Pale spikerush	Britton
Cyperaceae	Eleocharis rostellata Beaked spikerush	(Torr.) Torr.
Cyperaceae	Schoenoplectus americanus Chairmaker's bulrush	(Pers.) Volkart ex Schinz & R. Keller
Elaeagnaceae	Elaeagnus angustifolia Russian olive	L.
Ephedraceae	Ephedra fasciculata Arizona jointfir	A. Nelson
Euphorbiaceae	Argythamnia neomexicana New Mexico silverbush	Müll. Arg.
Euphorbiaceae	Chamaesyce albomarginata Whitemargin sandmat	(Torr. & A. Gray) Small
Euphorbiaceae	Chamaesyce micromera Sonoran sandmat	(Boiss. ex Engelm.) Woot. & Standl.
Euphorbiaceae	Chamaesyce setiloba Yuma sandmat	(Engelm. ex Torr.) J.B.S. Norton
Fabaceae	Acacia greggii Catclaw acacia	A. Gray
Fabaceae	Glycyrrhiza lepidota Wild licorice	Pursh
Fabaceae	Lotus glaber Narrow-leaf bird's-foot trefoil	Mill.
Fabaceae	Medicago sativa Alfalfa	L.
Fabaceae	Melilotus indicus Annual yellow sweetclover	(L.) All.
Fabaceae	Melilotus officinalis Yellow sweetclover	(L.) Lam.
Fabaceae	Prosopis glandulosa var. torreyana Western honey mesquite	Torr. var. (L.D. Benson) M.C. Johnst.
Fabaceae	Prosopis pubescens Screwbean mesquite	Benth.

Family	Scientific Name Common Name	Author
Fabaceae	Psoralea fremontii Fremont's dalea	(Torr. ex A. Gray) Barneby
Fabaceae	Trifolium fragiferum Strawberry clover	L.
Geraniaceae	Erodium cicutarium Redstem stork's bill	(L.) L'Hér. ex Aiton
Geraniaceae	Erodium texanum Texas stork's bill	A. Gray
Hydrocharitaceae	Vallisneria americana American eelgrass	Michx.
Hydrophyllaceae	Eucrypta micrantha Dainty desert hideseed	(Torr.) A. Heller
Hydrophyllaceae	Nama pusillum Eggleaf fiddleleaf	A. Gray
Hydrophyllaceae	Phacelia calthifolia Calthaleaf phacelia	Brand
Hydrophyllaceae	Phacelia crenulata var. crenulata Cleftleaf wildheliotrope	Torr. ex S. Watson
Hydrophyllaceae	Phacelia fremontii Fremont's phacelia	Torr.
Hydrophyllaceae	Phacelia incana Hoary phacelia	Brand
Hydrophyllaceae	Phacelia neglecta Alkali phacelia	M.E. Jones
Hydrophyllaceae	Phacelia pulchella var. gooddingii Goodding's phacelia	A. Gray var. (Brand) J.T. Howell
Iridaceae	Sisyrinchium sp. Blue-eyed grass	
Juncaceae	Juncus cooperi Cooper's rush	Engelm.
Juncaceae	Juncus mexicanus Mexican rush	Willd. ex Schult. & Schult. f.
Krameriaceae	Krameria erecta Pima ratany	Schultes
Krameriaceae	Krameria grayi White ratany	Rose & Painter
Lamiaceae	Lycopus americanus Bugleweed	W.C. Barton
Lamiaceae	Salazaria mexicana Mexican bladdersage	Torr.
Lemnaceae	Lemna sp. Duckweed	
Lemnaceae	Spirodela polyrrhiza Common duckmeat	(L.) Schleid.
Liliaceae	Androstephium breviflorum Pink funnel lily	S. Watson
Liliaceae	Calochortus flexuosus Winding mariposa lily	S. Watson
Loasaceae	Mentzelia albicaulis Whitestem blazingstar	(Hook.) Torr. & A. Gray
Loasaceae	Mentzelia oreophila Argus blazingstar	J. Darl.

Family	Scientific Name Common Name	Author
Loasaceae	Mentzelia tricuspis Spinyhair blazingstar	A. Gray
Lythraceae	Lythrum californicum California loosestrife	Torr. & A. Gray
Malvaceae	Eremalche rotundifolia Desert fivespot	(A. Gray) Greene
Malvaceae	Malva neglecta Common mallow	Wallr.
Malvaceae	Malvella leprosa Alkali mallow	(Ortega) Krapov.
Malvaceae	Sphaeralcea ambigua Desert globemallow	A. Gray
Malvaceae	Sphaeralcea angustifolia Copper globemallow	(Cav.) G. Don
Nyctaginaceae	Allionia incarnata var. villosa Trailing windmills	L. var. (Standl.) B.L. Turner
Nyctaginaceae	Boerhavia wrightii Largebract spiderling	A. Gray
Nyctaginaceae	Mirabilis laevis var. retrorsa Wishbone-bush	(Benth.) Curran var. (A. Heller) Jeps.
Nyctaginaceae	Selinocarpus nevadensis Desert moonpod	(Standl.) Fowler & Turner
Oleaceae	Fraxinus velutina Velvet ash	Torr.
Onagraceae	Camissonia brevipes Sun cup	(A. Gray) Raven
Onagraceae	Camissonia refracta Narrowleaf suncup	(S. Watson) P.H. Raven
Onagraceae	Epilobium ciliatum Fringed willowherb	Raf.
Onagraceae	Gaura coccinea Scarlet beeblossom	Nutt. ex Pursh
Papaveraceae	Eschscholzia glyptosperma Desert poppy	Greene
Plantaginaceae	Plantago lanceolata Narrowleaf plantain	L.
Plantaginaceae	Plantago major Common plantain	L.
Plantaginaceae	Plantago ovata Desert Indianwheat	Forsk.
Poaceae	Achnatherum hymenoides Indian ricegrass	(Roemer & Schultes) Barkworth
Poaceae	Andropogon glomeratus Southwestern bushy bluestem	(Walter) Britton, Sterns, & Pogg
Poaceae	Aristida purpurea var. wrightii Wright's threeawn	Nutt. var. (Nash) Allred
Poaceae	Avena fatua Wild oat	L.
Poaceae	Bouteloua barbata Sixweeks grama	Lag.
Poaceae	Bromus catharticus Rescuegrass	Vahl

Family	Scientific Name Common Name	Author
Poaceae	Bromus diandrus Ripgut brome	Roth
Poaceae	Bromus rubens Red brome	L.
Poaceae	Bromus tectorum Cheatgrass	L.
Poaceae	Cynodon dactylon Bermudagrass	(L.) Pers.
Poaceae	Dasyochloa pulchella Low woollygrass	(Kunth) Willd. ex Rydb.
Poaceae	Distichlis spicata Saltgrass	(L.) Greene
Poaceae	Echinochloa crus-galli Barnyardgrass	(L.) P. Beauv.
Poaceae	Holcus mollis German velvetgrass	L.
Poaceae	Hordeum brachyantherum Meadow barley	Nevski
Poaceae	Hordeum marinum ssp. gussonianum Mediterranean barley	Huds. spp. (Parl.) Thell.
Poaceae	Muhlenbergia asperifolia Scratchgrass	(Nees & Meyen ex Trin.) Parodi
Poaceae	Paspalum dilatatum Dallisgrass	Poir.
Poaceae	Phalaris minor Littleseed canarygrass	Retz.
Poaceae	Phragmites australis Common reed	(Cav.) Trin. ex Steud.
Poaceae	Pleuraphis rigida Big galleta	Thurb.
Poaceae	Polypogon monspeliensis Annual rabbitsfoot grass	(L.) Desf.
Poaceae	Schedonorus arundinaceus Tall fescue	(Schreb.) Dumort.
Poaceae	Schismus arabicus Arabian schismus	Nees
Poaceae	Schismus barbatus Common Mediterranean grass	(Loefl. ex L.) Thell.
Poaceae	Setaria sp. Bristlegrass	
Poaceae	Sporobolus airoides Alkali sacaton	(Torr.) Torr
Polemoniaceae	Aliciella hutchinsifolia Desert pale gilia	(Rydb.) J.M. Porter
Polemoniaceae	Aliciella latifolia Broad-leaf gilia	(S. Watson) J.M. Porter
Polemoniaceae	Gilia scopulorum Rock gilia	M.E. Jones
Polemoniaceae	Gilia transmontana Transmontane gilia	(H. Mason & A.D. Grant) A.D. Grant & V.E. Grant
Polemoniaceae	Ipomopsis polycladon Manybranched ipomopsis	(Torr.) V.E. Grant

Family	Scientific Name Common Name	Author
Polemoniaceae	Langloisia setosissima Great Basin langloisia	(Torr. & A. Gray ex Torr.) Greene
Polemoniaceae	Linanthus arenicola Sanddune linanthus	(M.E. Jones) Jeps. & V. Bailey
Polemoniaceae	Linanthus demissus Desert snow	(A. Gray) Greene
Polygonaceae	Chorizanthe brevicornu Brittle spineflower	Torr.
Polygonaceae	Chorizanthe rigida Devil's spineflower	(Torr.) Torr. & A. Gray
Polygonaceae	Eriogonum brachypodum Parry's buckwheat	Torr. & A. Gray
Polygonaceae	Eriogonum fasciculatum Eastern Moave buckwheat	Benth.
Polygonaceae	Eriogonum inflatum Desert trumpet	Torr. & Frém
Polygonaceae	Eriogonum thomasi Thomas' buckwheat	Torr.
Polygonaceae	Eriogonum trichopes Little deserttrumpet	Torr.
Polygonaceae	Polygonum punctatum Dotted smartweed	Elliot
Polygonaceae	Rumex crispus Curly dock	L.
Polygonaceae	Rumex hymenosepalus Canaigre dock	Torr.
Primulaceae	Samolus valerandi. ssp. parviflorus Seaside brookweed	L. ssp. (Raf.) Hultén
Punicaceae	Punica granatum Pomegranate	L.
Ranunculaceae	Delphinium parishii ssp. parishii Desert larkspur	A. Gray
Resedaceae	Oligomeris linifolia Lineleaf whitepuff	(Vahl) J.F. Macbr.
Resedaceae	Oligomeris linifolia Lineleaf whitepuff	(Vahl) J.F. Macbr.
Rutaceae	Thamnosma montana Turpentinebroom	Torr. & Frém.
Salicaceae	Populus fremontii ssp. fremontii Fremont cottonwood	S. Watson
Salicaceae	Salix exigua Narrowleaf willow	Nutt
Salicaceae	Salix gooddingii Goodding's willow	C.R. Ball
Scrophulariaceae	Mimulus guttatus Yellow monkeyflower	DC
Scrophulariaceae	Mohavea brevipflora Golden desert-snapdragon	Coville
Scrophulariaceae	Neogaerrhinum filipes Yellow twining snapdragon	(A. Gray) Rothm.
Scrophulariaceae	Veronica americana American brooklime	(Raf) Benth

Family	Scientific Name Common Name	Author
Solanaceae	Datura wrightii Sacred thorn-apple	Regel
Solanaceae	Lycium andersonii Water jacket	A. Gray
Solanaceae	Lycium cooperi Peach thorn	A. Gray
Solanaceae	Lycium torreyi Torrey wolfberry	A. Gray
Solanaceae	Nicotiana obtusifolia Desert tobacco	M. Martens & Galeotti
Solanaceae	Physalis crassifolia Yellow nightshade groundcherry	Benth.
Solanaceae	Solanum elaeagnifolium Silverleaf nightshade	Cav.
Suaruraceae	Anemopsis californica Yerba mansa	(Nutt.) Hook. & Arn.
Tamaricaceae	Tamarix aphylla Athel tamarisk	(L.) Karst
Tamaricaceae	Tamarix ramosissima Saltcedar	Ledeb.
Typhaceae	Typha domingensis Southern cattail	Pers.
Verbenaceae	Phyla lanceolata Lanceleaf fogfruit	(Michx.) Greene
Viscaceae	Phoradendron californicum Mesquite mistletoe	Nutt.
Vitaceae	Vitis arizonica Canyon grape	Engelm.
Zygophyllaceae	Larrea tridentata Creosote bush	(DC.) Coville
Zygophyllaceae	Tribulus terrestris Puncture vine	L.
Total Species:	248	

A.06 HYDROLOGIC MONITORING TABLE

Basin_no	Name_2	Alias1	Alias2	TYPE	WellType	Hydrogeologic Unit	AGENCY	WL MEASUREMENT FREQUENCY	PRODUCTION/ FLOW DATA FREQUENCY	Remarks	UTM_X	UTM_Y
Groundwater Monitoring:												
219	ABBOTT	UM7		Well	Monitor	Valley Fill	NPC (NVEnergy)	Monthly			706442.8946	4065656.5879
219	ARROW_CANYON			Well	Production	Carbonate	MVWD	Continuous	Continuous		701103.7690	4067755.2460
219	ARROW CANYON 2			Well	Production	Carbonate	MVWD	Continuous	Continuous		701103.3700	4067768.3000
219	BEHMER-MW			Well	Monitor	Valley Fill	NPC (NVEnergy)	Monthly			706030.6983	4065280.1818
219	CSV-1	364601114514301		Well	Monitor	Valley Fill	SNWA	Monthly			691377.9927	4071630.4100
219	CSV-2	364650114432001		Well	Monitor	Carbonate	SNWA/USGS/NV Energy	Continuous		NVEnergy includes data	703217.0806	4072966.7777
219	EH-4			Well	Monitor	Carbonate	NPC (NVEnergy)	Continuous			703929.2650	4064736.4078
219	EH-5B			Well	Monitor	Carbonate	NPC (NVEnergy)	Continuous			701568.7861	4067619.1347
219	LDS CENTRAL	UM49		Well	Production	Valley Fill	NPC (NVEnergy)	Monthly	Daily		704113.9580	4066543.6361
219	LDS EAST	UM50		Well	Production	Valley Fill	NPC (NVEnergy)	Monthly	Daily		704478.9759	4066594.2407
219	LDS WEST	UM18		Well	Production	Valley Fill	NPC (NVEnergy)	Monthly	Daily		702746.2777	4067083.3415
219	LEWIS 1 OLD	UM55		Well	Monitor	Valley Fill	NPC (NVEnergy)	Monthly			702076.8581	4068229.1435
219	LEWIS 2	UM74		Well	Production	Valley Fill	NPC (NVEnergy)	Continuous	Daily		702339.3990	4067921.3381
219	LEWIS NORTH	UM45		Well	Monitor	Valley Fill	NPC (NVEnergy)	Continuous			701588.5926	4067871.6716
219	LEWIS SOUTH	UM43		Well	Monitor	Valley Fill	NPC (NVEnergy)	Continuous			702737.1327	4067265.8985
219	MX-6	CE-DT-6	364604114471301	Well	Production	Carbonate	MVWD	Monthly	Continous		697482.4475	4071381.1641
219	PERKINS OLD	UM15		Well	Monitor	Valley Fill	NPC (NVEnergy)	Continuous			705637.2978	4065223.3801
219	PERKINS PRODUCTION			Well	Production	Valley Fill	NPC (NVEnergy)	Monthly	Daily		705692.9601	4065206.0659
219	UMVM-1	DEADMAN WASH		Well	Monitor	Carbonate	SNWA	Continuous			694304.6450	4070247.5450
220	EH-3			Well	Monitor	Carbonate	NPC (NVEnergy)	Continuous			721085.0000	4063300.0000
220	EH-7			Well	Monitor	Carbonate	NPC (NVEnergy)	Continuous			720660.0000	4060990.0000
Surface Water Monitoring:												
219	BALDWIN SPRING BOX			Spring		Flow Meter	MVWD	Continuous	Continuous		703257.3243	4066270.2745
219	JONES SPRING BOX			Spring		Flow Meter	MVWD	Continuous	Continuous		703713.6616	4065660.8144
219	PEDERSON EAST SPRING GAGE	PLAYBOY POOL GAGE		Spring		Flume	SNWA/USGS	Continuous	Continuous		704034.2489	4065063.0421
219	PEDERSON SPRING GAGE			Spring		Weir	SNWA/USGS	Continuous	Continuous		704008.0508	4065088.5140
219	WARM SPRINGS WEST GAGE			Spring		Flume	SNWA/USGS	Continuous	Continuous		704210.7611	4065272.2446
219	IVERSON FLUME			Stream		Flume	SNWA/USGS	Continuous	Continuous		704569.9449	4065295.8619
219	MUDDY SPRING GAGE			Spring		Flume	SNWA/USGS	Continuous	Continuous		704018.1277	4066347.6635
219	MOAPA GAGE			Stream		Stream Gage	USGS	Continuous	Continuous		705823.3289	4065349.9049
220	GLENDALE GAGE			Stream		Stream Gage	USGS	Continuous	Continuous		719896.9331	4058057.4259
220	OVERTON GAGE			Stream		Stream Gage	SNWA/USGS	Continuous	Continuous		730091.3558	4046453.5134
215	BLUE POINT SPRING			Spring		Stream Gage	NPS	Continuous	Continuous		730352.7311	4030270.7397
215	ROGERS SPRING			Spring		Stream Gage	NPS	Continuous	Continuous		729419.7449	4028891.3629

Source: List of sites that will be monitored for the duration of the Order 1169 test, as requested by, and submitted to, the Nevada Division of Water Resources

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