

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



ELKO SEGMENT, HYDROGRAPHIC BASIN 4-049

CROP INVENTORY

CALENDAR YEAR 2015

Prepared by: Eric Schadeck
Landon Harris and Kyle Wolf

TABLE OF CONTENTS

	Page
ABSTRACT	1
HYDROGRAPHIC BASIN SUMMARY	2
PURPOSE AND SCOPE	3
DESCRIPTION OF THE STUDY AREA	3
GROUNDWATER LEVELS	3
METHODS TO ESTIMATE IRRIGATED ACREAGE	4
METHODS TO ESTIMATE PUMPAGE	4
TABLES	5
FIGURES	6
APPENDIX A. 2015 ELKO SEGMENT CROP INVENTORY	9

LIST OF TABLES

	Page
Table 1. Elko Segment historical irrigated acreage and pumpage data.	5

LIST OF FIGURES

	Page
Figure 1. Physiographic map of Elko Segment (Hydrographic Basin 4-049).	6
Figure 2. Aerial imagery with Elko Segment active water level monitoring sites.	7
Figure 3. Graph showing the Elko Segment historical irrigated acreage and pumpage. The NIWR method to estimate pumpage was used starting in 2014; estimates may differ significantly from previous years.	8

ABSTRACT

This inventory represents the status and usage of all permitted, certificated, and claims of vested right groundwater rights for irrigation purposes located within Elko Segment, Hydrographic Basin 4-049, for the year 2015. **Only those groundwater rights associated with irrigation purposes are represented in this report.** For a listing and summary of all other manners of use within the basin please refer to the [Nevada Division of Water Resources Hydrographic Basin Summary](#).

The data presented are valid for the time period of this report and may vary from previously published figures as water rights within the basin are subject to administrative action, such as certification, cancellation, forfeiture or withdrawal on a continuing basis.

For the year 2015, the permitted and certificated groundwater rights for irrigation purposes totaled **234 acres** with a total duty of 829 acre-feet within Elko Segment. An estimated **58 acres** were irrigated and 189 acre-feet were pumped during 2015.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER	049, REGION 4
HYDROGRAPHIC BASIN NAME	ELKO SEGMENT
COUNTIES	ELKO
MAJOR COMMUNITIES	CITY OF ELKO
DESIGNATED BASIN	DESIGNATED
DENIALS BASED UPON WATER AVAILABILITY	2750 , IRD DEN, 3/1/1982 4063 , IRR DEN, 12/20/1993 5980 , IRR DEN, 10/2/2001 5988 , MUN DEN, 5/8/2009
ESTIMATED IRRIGATION PUMPAGE 2015 (ACRE-FEET)	189*

STATE ENGINEER'S ORDERS

NO. 778 – DESIGNATION (PORTION)	DECEMBER 8, 1981
NO. 782 – NOTICE OF CURTAILMENT	JANUARY 2, 1982
NO. 864 – DESIGNATION OF BASIN (REMAINING PORTION)	JULY 10, 1985
NO. 872 – PREFERRED USE (PORITON)	JULY 18, 1985
NO. 1251 – METER	FEBRUARY 5, 2015

COMMITTED GROUNDWATER RESOURCE FOR IRRIGATION PURPOSES: 829 ACRE-FEET
DATE: DECEMBER 2015

NOTE: Committed groundwater resource data are accurate for December 2015. Rights may be subject to change applications, certification, withdrawals, forfeiture and cancellations; each of these circumstances could impact the duty, diversion rate and acreage associated with a given right. Be advised this report acknowledges that other manner of uses may be present in the basin; however, only those groundwater rights associated with irrigation purposes are represented in this report.

* Acreage represented in this report may have surface water rights appurtenant. This report acknowledges those acres with surface water rights but is not intended to quantify, nor present any definitive use of those surface water rights. The data represent only the pumping of groundwater and the acreage to which it is applied.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated to irrigation and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped for irrigation purposes within the Elko Segment Hydrographic Basin (4-049), for the year 2015.

DESCRIPTION OF THE STUDY AREA

The Elko Segment Hydrographic Basin is located in northeastern Nevada (Figure 1), occupying approximately 314 square miles in Elko County. The adjacent hydrographic basins are Marys Creek Area (4-052), Maggie Creek Area (4-051), Susie Creek Area (4-050), and North Fork Area (4-044) to the north and west; Lamoille Valley (4-045) and Dixie Creek-Tenmile Creek Area (4-048) to the east; and Pine Valley (4-053) to the south.

Elko Segment is bounded on the northwest by the Adobe Range, to the east by the Elko Hills, and to the southeast by the Elko Mountains. The Humboldt River runs through the middle of the basin, except in the southwestern part of the basin where the river is the western basin boundary. This Basin includes the City of Elko, is elongated in a northeasterly direction, and is approximately 9 miles wide by 36 miles long. Basin elevations range from approximately 4,900 feet above mean sea level on the valley floor to approximately 7,500 feet in the surrounding mountains. Irrigation occurs primarily in the central part of the basin (Figure 2).

GROUNDWATER LEVELS

Depths to groundwater in the Elko Segment are measured on a semi-annual basis. Active measurement sites and links to their data include:

[049 N32 E52 13CDBC2](#)
[049 N34 E54 26CDB 1](#)
[049 N34 E54 35CBC 1](#)
[049 N34 E55 07CA 1](#)
[049 N34 E55 11BA 1](#)
[049 N34 E55 15DBD 1](#)
[049 N34 E55 16DAB 1](#)
[049 N34 E55 21CCD 1](#)

[049 N34 E55 21CDB 1](#)
[049 N34 E55 21DCC 1](#)
[049 N34 E55 24BAA 1](#)
[049 N34 E55 33B 1](#)
[049 N35 E56 19BBAA1](#)
[049 N35 E56 19BDDD1](#)
[049 N35 E56 19DCAA1](#)

[049 N35 E56 19DCDB1](#)
[049 N35 E56 19DDCD2](#)
[049 N35 E56 19DDDA1](#)
[049 N35 E56 20CCC 1](#)
[049 N35 E56 30AACD1](#)
[049 N35 E56 30DBBB1](#)
[049 N35 E56 31BBB 1](#)

Groundwater level data have also been collected by the U.S. Geological Survey (USGS) and can be accessed through their website (<http://nevada.usgs.gov>).

METHODS TO ESTIMATE IRRIGATED ACREAGE

This report estimates the number of acres irrigated by the groundwater pumped under permits, certificates, and claims of vested right issued by the State Engineer. Table 1 and Figure 3 present the current and historic irrigated acreage and pumpage; Appendix A presents estimates detailed by certificate, permit, or vested claim number. The following methods were used to arrive at the estimated acreage:

- Field inspection of the place of use was conducted to estimate the number of acres under cultivation.
- In cases where field inspection of the place of use was not practical, aerial and/or satellite imagery were analyzed to determine acreages.

METHODS TO ESTIMATE PUMPAGE

This report estimates the amount of groundwater pumped under the permits and certificates issued by the Nevada State Engineer as well as claims of vested right and exempt domestic wells in the Elko Segment Basin. The following methods were used to arrive at the estimated use:

- Where totalizing meters were in place, meter readings were taken and compared with previous data (if available).
- Where meters were not in place and the use was irrigation, pumpage was estimated by multiplying the number of hours the well was operated during the past year (determined from an hour meter reading or asking the water user) by the certificated diversion rate.
- Where there were no flow meters or other reliable options for estimating pumpage and the use was irrigation, pumpage was estimated by dividing the Net Irrigation Water Requirement (NIWR) for the crop grown by the efficiency of the irrigation method used, then multiplying by the number of acres irrigated. Irrigation efficiencies associated with three types of irrigation methods are: pivot at 85%; wheel line or other hand moved sprinklers at 75%; and flood at 60%. The pumpage amount estimated by this method was limited by the duty of the permit. For places where the groundwater rights are supplemental to surface water, groundwater use was estimated using the NIWR method above, but adjusted based on available surface water for the year. Evapotranspiration and NIWR data by basin can be found on the NDWR website at: http://water.nv.gov/mapping/et/et_general.cfm. This approach using the NIWR to estimate pumpage was not used in previous inventories, and pumpage estimates for 2014 and subsequent years may differ significantly from estimates of previous years.
- Where lands are irrigated by both surface water and groundwater, the surface water supply for the irrigation season was considered in estimating groundwater pumpage.

TABLES

Table 1 Elko Segment historical irrigated acreage and pumpage data.

Year	2011	2012	2013	2014	2015
Acres Irrigated	58	58	58	58	58
Acre-Feet Pumped*	220	218	218	188	189

* The NIWR method to estimate pumpage was used starting in 2014; estimates may differ significantly from previous years.

FIGURES

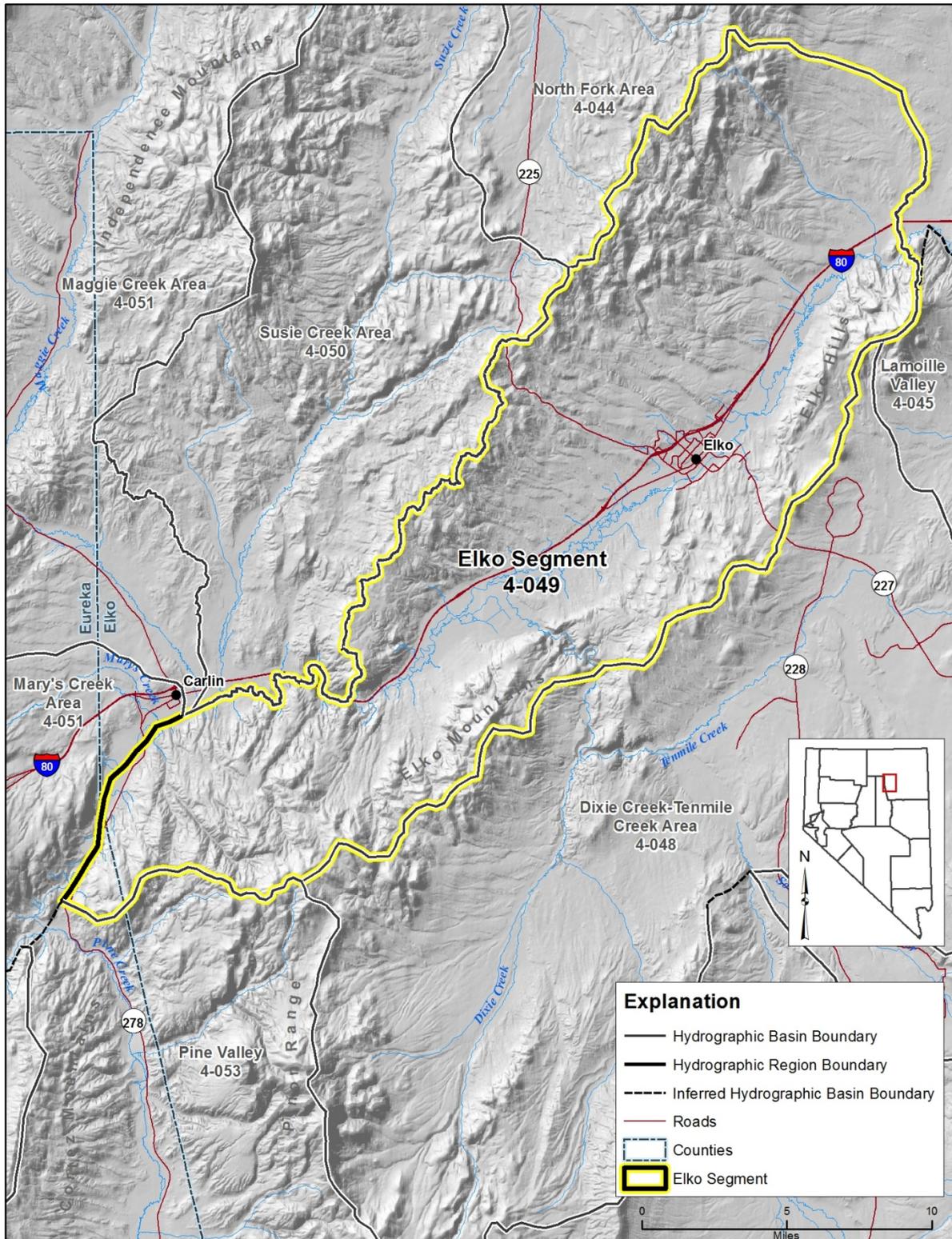


Figure 1. Physiographic map of Elko Segment (Hydrographic Basin 4-049).

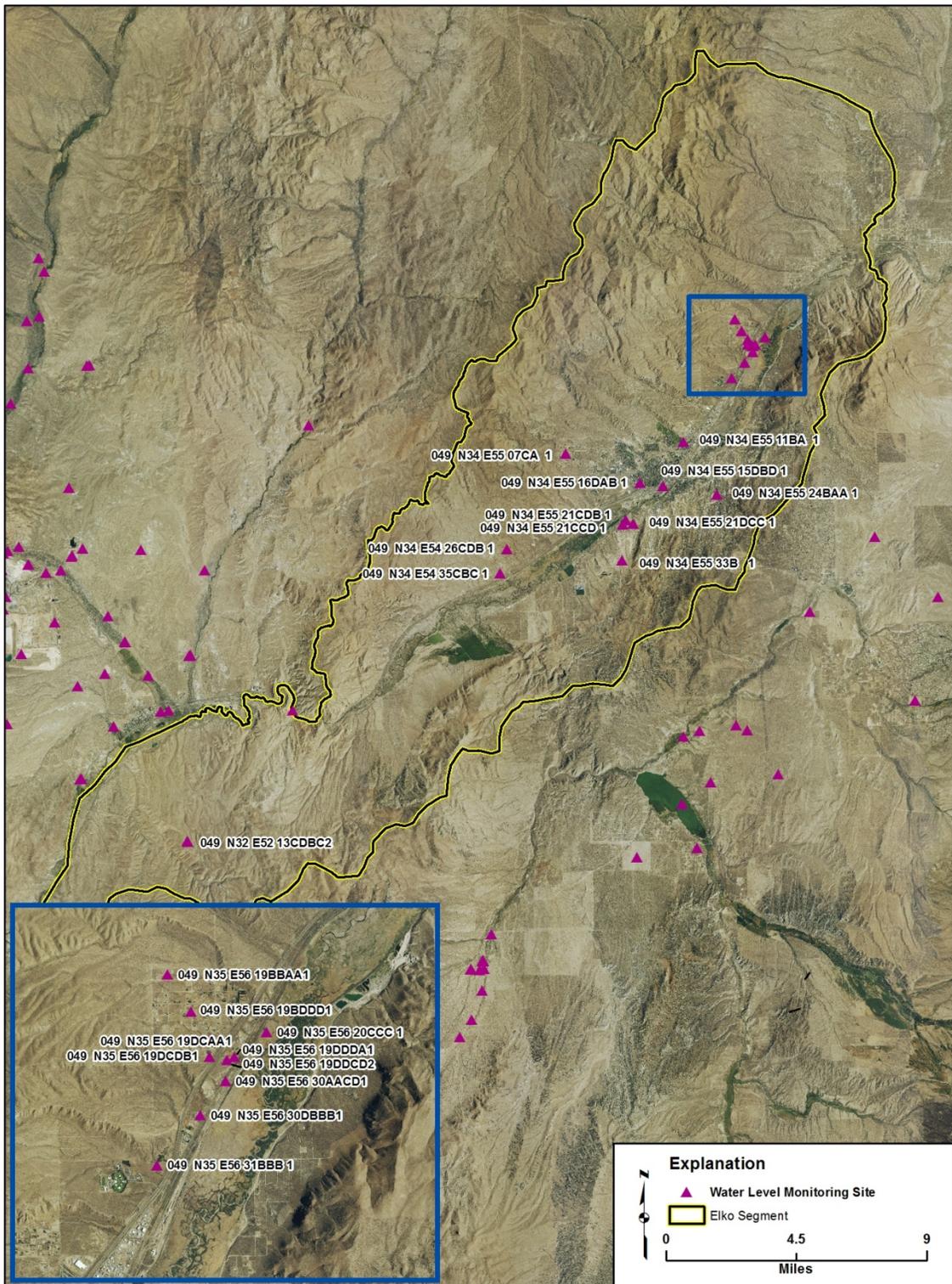


Figure 2. Aerial imagery with Elko Segment active water level monitoring sites.

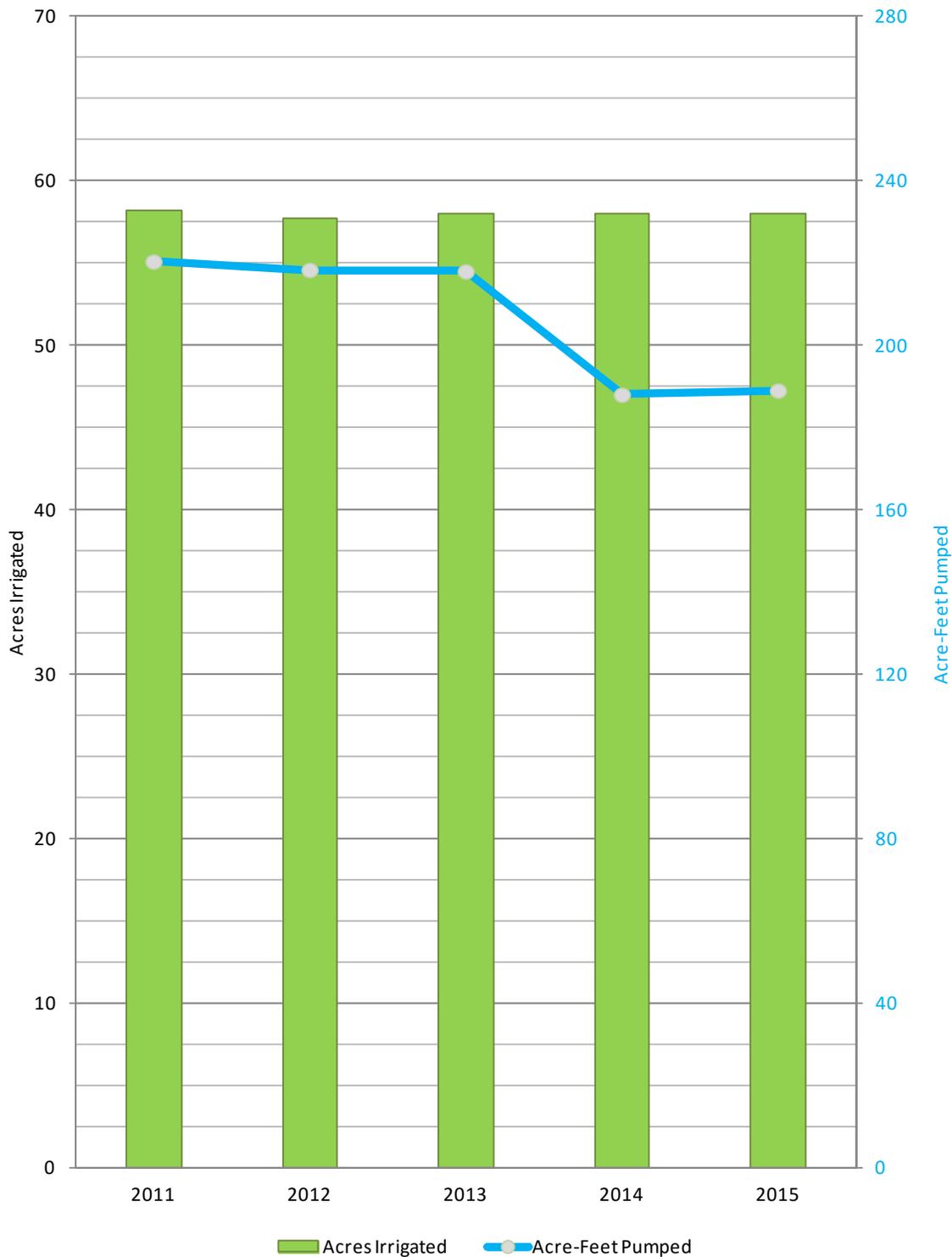


Figure 3. Graph showing the Elko Segment historical irrigated acreage and pumpage. The NIWR method to estimate pumpage was used starting in 2014; estimates may differ significantly from previous years.

APPENDIX A. 2015 ELKO SEGMENT CROP INVENTORY.

EXPLANATION OF COLUMN HEADINGS

App No	The file number of the Application to Appropriate/Change Water or the Claim of Vested Right.
Status	Indicates the status of an application: Permit (PER), Certificated (CER), or a Claim of Vested Right (VST).
QQ	The quarter-quarter of the Section in which the point of diversion is located.
Q	The quarter of the Section in which the point of diversion is located.
Sec	The Section in which the point of diversion is located.
Twn	The Township in which the point of diversion is located.
Rng	The Range in which the point of diversion is located.
Sup	Indicates whether the groundwater right is part of a group of groundwater rights used to irrigate all or a portion of the same acreage (supplemental). A “Y” in this column signifies the groundwater right is supplemental to other groundwater rights.
Supplemental Application Number	The application number(s) of the water right(s) that are supplemental to one another.
Permitted Acres	The number of acres defined by the permit or certificate that is eligible to be irrigated.
Supplementally Adjusted Permitted Acres	The supplementally adjusted, total number of acres that is eligible to be irrigated under a supplemental group of water rights.
Permitted Duty Acre-Feet	The amount of water that may be pumped in a given year, or season, as defined by the permit, certificate, or claim of vested right. If there is a supplemental group, the total combined duty is listed as a supplementally adjusted duty.
Supplementally Adjusted Duty Acre-Feet	The supplementally adjusted, total combined duty that may be pumped in a given year, or season, for a supplemental group of water rights, expressed in acre-feet. The supplementally adjusted, total combined duty is listed at the end of a supplemental group in bold .
Owner of Record	The owner of the water right as recorded in the records of the State Engineer. A water right may have more than one owner of record. Only the first, alphabetically, is listed in this table.
Crop Type	Indicates whether or not a crop was in production during the water year. If a crop was in production, the common name description of the plants under cultivation if given (e.g. alfalfa).

NIWR (ft)	Net Irrigation Water Requirement, defined to be equal to the annual crop evapotranspiration less the effective precipitation entering the root zone that is available for evaporation or transpiration.
Irrigation Method	The method by which the water is applied to the crop and ground (e.g. pivot).
Irrigation Efficiency	The estimated efficiency of the desired irrigation method used.
Irrigated Acreage	The estimate of the number of acres irrigated associated with a particular water right. A “-“ in this field indicates that pumpage was attributed to a senior supplemental permit or certificated water right.
Acreage Estimation Method	The method by which the number of acres irrigated was determined. F – Field inspection. I – Aerial or satellite imagery.
Acre-Feet Pumped	The estimate of the amount of water pumped under a particular water right, expressed in acre-feet. One acre-foot equals 325,851 gallons. A “-“ in this field indicates that pumpage was attributed to a senior supplemental permit or certificated water right.
Pumpage Estimation	The method used to estimate the amount of water pumped. M – Totalizing meter readings. N – NIWR Method.
Remarks	The numbers in this column correspond to footnotes at the end of the table.

Crop Inventory and Groundwater Pumpage for Irrigation - Elko Segment, Basin 049, 2015

App No	Status	QQ	Q	Sec	Twn	Rng	Sup	Supplemental Application Number	Permitted Acres	Supplementally Adjusted Permitted Acres	Permitted Duty Acre-Feet	Supplementally Adjusted Duty Acre-feet	Owner of Record	Crop Type	NIWR (ft)	Irrigation Method	Irrigation Efficiency (%)	Irrigated Acres	Acreage Estimation Method	Acre-Feet Pumped	Pumpage Estimation Method	Remarks
54672	CER	NW	NW	2	33N	54E			7.30	7.30	21.90	21.90	REED, JAKE L	MEADOW HAY/PASTURE	2.1	FLOOD	60%	7.30	F	25.55	N	AFS
																TOTAL:		7.30		21.90		AFS
27568	CER	SW	SE	7	34N	55E			3.07	3.07	12.28	12.28	WOODSON, WADE F	DOMESTIC USE	2.5	YARD/TREES	75%	1.00	F	3.33	N	AFA
																TOTAL:		1.00		3.33		AFA
28044	CER	SE	SE	7	34N	55E			1.00	1.00	4.00	4.00	LIPPARELLI, BARRY A	DOMESTIC USE	2.5	YARD/TREES	75%	1.00	F	3.33	N	AFA
																TOTAL:		1.00		3.33		AFA
30346	CER	SE	NE	7	34N	55E			0.261	0.261	1.04	1.04	SEYFERTH, CHARLOTTE	YARD/ DOMESTIC	2.5	LANDSCAPING	75%	0.26	F	0.87	N	AFA
																TOTAL:		0.26		0.87		AFA
31856	CER	SW	SE	7	34N	55E			2.58	2.58	10.32	10.32	BITTON, DEBORAH L	LAND SCAPING/ TREES	2.5	SPRINKLERS	75%	2.58	F	8.60	N	AFA
																TOTAL:		2.58		8.60		AFA
34296	CER	SE	NW	7	34N	55E			7.00	7.00	28.00	28.00	CHESTER, CHARLES J	NO CROP	n/a	SPRINKLERS	75%	0.00	F	0.00	N	AFS
																TOTAL:		0.00		0.00		AFS
34298	CER	NE	SW	7	34N	55E			17.43	17.43	52.52	52.52	CHESTER, CHARLES H	NO CROP	n/a	WHEEL LINE	75%	0.00	F	0.00	N	AFS
																TOTAL:		0.00		0.00		AFS
35400	CER	SW	SE	7	34N	55E			3.427	3.427	13.71	13.71	BERGERON, LOUIS AND PAULA	DOMESTIC USE STOCK WATERING	2.5	n/a	75%	0.50	F	1.67	N	AFS
																TOTAL:		0.50		1.67		AFS
80834	PER	SW	SE	7	34N	55E			2.96	2.96	11.85	11.85	BERGERON, LOUIS & PAULA	NO CROP	n/a	NO IRR	n/a	0.00	F	0.00	N	AFA
																TOTAL:		0.00		0.00		AFA
44380	CER	SW	SE	7	34N	55E			2.09	2.09	8.38	8.38	BAER, TEDDI J	YARD/ TREES	2.5	LANDSCAPING	75%	1.00	F	3.33	N	AFA
																TOTAL:		1.00		3.33		AFA
46789	CER	NE	SW	7	34N	55E			7.19	7.19	28.77	28.77	PARIS, MARK	TREES & DOMESTIC	2.5	LANDSCAPING	75%	0.50	F	1.67	N	AFA
																TOTAL:		0.50		1.67		AFA
20521	CER	NW	NW	8	34N	55E			1.83	1.83	7.32	7.32	ELDRIDGE, MARK D AND VERONICA	DOM, GARDEN, YARD, STKWATER	2.5	LANDSCAPING	75%	1.00	F	3.33	N	AFA
																TOTAL:		1.00		3.33		AFA
24014	CER	NE	NW	8	34N	55E			2.50	2.50	10.00	10.00	MONTROSE, OWEN	DOM, YARD, TREES	2.5	LANDSCAPING	75%	1.00	F	3.33	N	AFA
																TOTAL:		1.00		3.33		AFA
43040	CER	SW	NW	8	34N	55E			0.50	0.50	1.00	1.00	BOYACK, ALAN S. & PHYLLIS	YARD, DOMESTIC	2.5	LANDSCAPING	75%	0.50	F	1.67	N	AFA
																TOTAL:		0.50		1.00		AFA

App No	Status	QQ	Q	Sec	Twn	Rng	Sup	Supplemental Application Number	Permitted Acres	Supplementally Adjusted Permitted Acres	Permitted Duty Acre-Feet	Supplementally Adjusted Duty Acre-feet	Owner of Record	Crop Type	NIWR (ft)	Irrigation Method	Irrigation Efficiency (%)	Irrigated Acres	Acreage Estimation Method	Acre-Feet Pumped	Pumpage Estimation Method	Remarks
55403	CER	SE	SW	8	34N	55E			0.274	0.274	0.95	0.95	BOYACK, ALAN S	YARD, DOMESTIC	2.5	LANDSCAPING	75%	0.27	F	0.90	N	AFA
																TOTAL:		0.27		0.90		AFA
55404	CER	SE	SW	8	34N	55E			0.218	0.218	0.87	0.87	BOYACK, ALAN S	YARD, DOMESTIC	2.5	LANDSCAPING	75%	0.22	F	0.73	N	AFA
																TOTAL:		0.22		0.73		AFA
55405	CER	SE	SW	8	34N	55E			0.50	0.50	1.00	1.00	BOYACK, PHYLLIS & ALLAN S.	YARD, DOMESTIC	2.5	LANDSCAPING	75%	0.50	F	1.67	N	AFA
																TOTAL:		0.50		1.00		AFA
55406	CER	NW	SE	8	34N	55E			0.39	0.39	1.00	1.00	BOYACK, ALAN S	YARD, DOMESTIC	2.5	LANDSCAPING	75%	0.39	F	1.30	N	AFA
																TOTAL:		0.39		1.30		AFA
22570	CER	SE	SE	14	34N	55E			3.70	3.70	14.80	14.80	BAUMANN, FRANCES JEAN	DOMESTIC	2.5	LANDSCAPING	75%	0.50	F	1.67	N	AFA
																TOTAL:		0.50		1.67		AFA
27824	CER	SE	NE	17	34N	55E			4.79	4.79	19.16	19.16	CLARIDGE, REX C	LANDSCAPING/TREES	2.5	SPRINKLERS	75%	4.79	F	15.97	N	AFA
																TOTAL:		4.79		15.97		AFA
17465	CER	SW	SW	21	34N	55E			23.50	23.50	94.00	94.00	TRINDLE, THOMAS G & MEREDITH	GRASS HAY	2.5	H. LINE	75%	23.50	F	78.33	N	AFS
																TOTAL:		23.50		78.33		AFS
29855	CER	SW	NW	20	35N	56E			11.65	11.65	46.61	46.61	BOYCE, TED B. & DALE J.	LANDSCAPING/TREES	2.5	SPRINKLERS	75%	2.00	F	6.67	N	AFA
																TOTAL:		2.00		6.67		AFA
50069	CER	NE	SW	20	35N	56E		SUPP TO A PORTION OF PROOF 00201	43.67	43.67	174.68	174.68	ELKO BLACKSMITH SHOP, INC	MEADOW HAY	2.1	NOT PUMPED	n/a	0.00	F	0.00	N	AFA
																TOTAL:		0.00		0.00		AFA
17108	CER	NW	NW	31	35N	56E			43.80	43.80	131.40	131.40	NEVADA YOUTH TRAINING CENTER	NO CROP	n/a	NOT PUMPED	n/a	0.00	F	0.00	N	AFS
																TOTAL:		0.00		0.00		AFS
28466	CER	NE	SE	35	35N	55E			2.50	2.50	10.00	10.00	ROSE, JOHN & RANAE	LANDSCAPING/TREES & DOMESTIC	2.5	SPRINKLERS	75%	2.50	F	8.33	N	AFA
																TOTAL:		2.50		8.33		AFA
55455	CER	NE	SW	35	35N	55E			3.83	3.83	15.32	15.32	MENAKA, JOSE B	ALFALFA	2.6	WHEEL LINE	75%	3.83	F	13.28	N	AFA
																TOTAL:		3.83		13.28		AFA
16929	CER	NW	NE	36	35N	55E		SUPP TO A PORTION OF PROOF 00201	36.10	36.10	108.30	108.30	NEVADA SCHOOL OF INDUSTRY	LANDSCAPING/TREES	2.5	SPRINKLERS	75%	2.60	F	8.67	N	AFA
																TOTAL:		2.60		8.67		
								TOTAL:	234.06			829.18				TOTAL:		57.74		189.20		