STATE OF NEVADA
COMMISSION ON MINERAL RESOURCES
DIVISION OF MINERALS
400 W. King Street, Suite 106
Carson City, Nevada 89703
(775) 684-7040 • Fax (775) 684-7052
http://minerals.nv.gov/

BRIAN SANDOVAL
Governor

Las Vegas Office: 2030 E. Flamingo Rd. #220, Las Vegas, NV 89119
Phone: (702) 486-4343; Fax: (702) 486-4345

RICHARD PERRY
Administrator

COMMISSION ON MINERAL RESOURCES
Eureka County Courthouse Commission Chambers
10 South Main Street Eureka, Nevada 89316

Thursday, August 23, 2018 1:00 P.M.

AGENDA

CALL TO ORDER The Agenda for this meeting of the Commission on Mineral Resources has been properly posted for this date and time in accordance with NRS requirement.

ROLL CALL

PLEDGE OF ALLEGIANCE

COMMENTS BY THE GENERAL PUBLIC Pursuant to N.R.S. 241, this time is devoted to comments by the public, if any, and discussion of those comments. No action may be taken upon a matter raised under this item on the agenda until the matter itself has been specifically included on a successive agenda and identified as an item for possible action. All public comments will be limited to 5 minutes for each person.

ACTION WILL NOT BE TAKEN

I. MINUTES

A. Approval of the May 17, 2018 meeting minutes **FOR POSSIBLE ACTION**

II. NEW BUSINESS

A. Northern Nevada Education Activities – The northern Nevada Earth Science Teachers Workshop was held at Wooster High School on July 17, 2018. Four NDOM Staff presented classes at the workshop, which included a new activity entitled "Drilling For Energy in Nevada". Courtney Brailo will summarize the activities at the workshop and other NDOM education and outreach activities in northern Nevada. **FOR DISCUSSION ONLY**

B. Summary of oil, geothermal and dissolved mineral resource drilling activities from January 2017 to July, 2018, updates to the oil and gas database, and results of the most recent oil/gas leasing on Federal lands in Nevada – Lowell Price **FOR DISCUSSION ONLY**

C. Nevada Land Withdrawals from Mineral Entry-A Historical Perspective This report and presentation was first developed in 2011 at the direction of the Commission on Mineral Resources by the Geography Department at UNR. Garrett Wake recently updated the maps and presentation to highlight **FOR DISCUSSION ONLY**

changes in the past two years and pending actions which could reduce lands in Nevada available for mineral entry. – Garrett Wake

D. Consideration of funding a minerals and geology display at the Las Vegas Natural History Museum. The Las Vegas Natural History Museum is relocating to a larger space and is seeking support for interactive educational exhibits on Nevada minerals, geology and uses. The Museum has provided an example of an interactive exhibit and requested funding of up to $50,000 and in-kind assistance with design, and a supply of Nevada minerals and rocks. This would be a one-time item in the current fiscal year and would require the Division to work with the museum on the exhibit design and a scope of work that would be put out to bid, and delivered to the museum by the end of the current fiscal year. The Division has funding available for this in FY 2019. If approved by the Commission, approval from IFC and /or the BOE would also be required. – Rich Perry **FOR POSSIBLE ACTION**

III. OLD BUSINESS

A. Presentation and possible approval of the NDOM 2020-21 biennium budget. Division staff has prepared a budget for the next biennium that must be submitted to the Governor's finance office on August 31st. At the May CMR meeting, preliminary assumptions to build the budget were presented and discussed. Division staff will present the budget that was built since that meeting when the CMR provided guidance, and after closing of fiscal year 2018. Mike Visher and Rich Perry **FOR POSSIBLE ACTION**

B. AML Program: Broken Hills Mine Closure Project, Gold Butte Project and AML Summer intern work completed.- Rob Ghiglieri **FOR DISCUSSION ONLY**

IV. STAFF REPORTS

1.) Mining and Reclamation Bond Pool – Mike Visher
2.) Administrator Report and Correspondence

COMMISSION BUSINESS
Determination of time and place of next CMR meeting

COMMENTS BY THE GENERAL PUBLIC Pursuant to N.R.S. 241, this time is devoted to comments by the public, if any, and discussion of those comments. No action may be taken upon a matter raised under this item on the agenda until the matter itself has been specifically included on a successive agenda and identified as an item for possible action. All public comments will be limited to 5 minutes for each person.

ACTION WILL NOT BE TAKEN

NOTICE TO PERSONS WITH DISABILITIES

Members of the public who are disabled and require special accommodations or assistance at the meeting are requested to notify the Division of Minerals, 400 W. King Street, suite 106, Carson City, NV 89701 or contact Valerie Kneefel at (775) 684-7043 or Email Vkneefel@minerals.nv.gov

The Commission will be attending a field trip on Friday 8/24 to McEwan Mining's Gold Bar mine, located west of Eureka. The Commission will caravan in a number of trucks and stage some of these at the turn-off off of Highway 50 and Three Bars Road to minimize the number of vehicles. Members of the public may attend but must provide their own transportation and safety equipment. Advanced notification is required. Please call Valerie Kneefel at (775) 684-7043.

I. MINUTES

STATE OF NEVADA
COMMISSION ON MINERAL RESOURCES
DIVISION OF MINERALS
400 W. King Street, Suite 106
Carson City, Nevada 89703
(775) 684-7040 • Fax (775) 684-7052
http://minerals.nv.gov/

BRIAN SANDOVAL
Governor

Las Vegas Office: 2030 E. Flamingo Rd. #220, Las Vegas, NV 89119
Phone: (702) 486-4343; Fax: (702) 486-4345

RICHARD PERRY
Administrator

COMMISSION ON MINERAL RESOURCES
Clark County Commission Chambers
500 S. Grand Central Pkwy., Las Vegas, NV 89155

Thursday, May 17, 2018 1:00 P.M.

MINUTES

CALL TO ORDER
1:02 PM

ROLL CALL
All commissioners were present with the exception of John Snow.

Commission Present:	Staff Present:
Richard DeLong	Rich Perry
Dennis Bryan	Rob Ghiglieri
Nigel Bain	Valerie Kneefel
Art Henderson	Mike Visher
Mary Korpi	Garrett Wake
David Parker	Aubrey Bonde
	Debbie Selig
	Bryan Stockton

PLEDGE OF ALLEGIANCE

COMMENTS BY THE GENERAL PUBLIC

Rich DeLong: We lost a great Nevadan recently, Fred Gibson. His interests in Nevada were very wide ranging, from industry to philanthropy to mining. He served as the chairman of the Minerals Commission for approximately 30 years. He helped guide the Commission and the Division through several incarnations. His wisdom, insight and friendship will be greatly missed.

I. MINUTES

A. Approval of the February 20, 2018 meeting minutes
Motion to approve minutes by Nigel Bain
Seconded by David Parker
Unanimously approved

B. Approval of the April 27, 2018 Commission hearing minutes
Motion to approve minutes by Dennis Bryan
Seconded by David Parker
Unanimously approved

II. NEW BUSINESS

A. NDOM Abandoned Mine Lands (AML) 2017 program summary and plan for 2018 work activities. AML Chief Rob Ghiglieri will present.

Rob Ghiglieri: Gave a PowerPoint presentation:

The following is a 2017 Review-

There were NO reported abandoned mine accidents or fatalities making 2017 the fourth year in a row without an incident.

In 2017, 1,021 hazards were discovered and 1,152 hazards were secured. 641 hazards securing's by the Division, the most in program history for a calendar year. 957 known hazards were revisited to confirm securing status and make repairs as needed. Hazards discovered and ranked since the beginning of the program is now 21,632 discovered and the total number recorded as secured is 17,456. 329 permanent AML closures took place in 13 of 17 Nevada counties. There were 87 by the Division.

The AML interns secured 490 hazards between summer and winter. The Division and its contractor Environmental Protection Services built a demonstration bat compatible grate with informational kiosk at the Tonopah Historic Mining Park. The Division surpassed both of the AML performance indicators required by the State Legislature. 80.7% of discovered hazards were secured, and total public awareness presentations averaged 31 per staff member for the year.

Here are the 2017 Emergency Closures-

Carnation- A Jeep was parked on the road when the back right tire collapsed into a "ballroom" style working below and almost took the Jeep with it. The hazard was fenced and road closed the following day after being reported. 14 hazards in the immediate area were closed, including five wildlife compatible closures, for $46,038.68.

Monte Cristo-A collapse of a "ballroom" style working along the Virginia City Grand Prix race route. NDOM staff and Storey County firefighter constructed a fence the same day it was reported. Site was backfilled for $3,000.

Rich Perry: Clark County is only for the Winter Interns.

Nigel Bain: You're doing record numbers, is it true to say that our cost per site or closure is going down?

Rob Ghiglieri: as for fencings, the record to that is a combination between summer and winter interns. The winter interns are getting 150 to 200 fencings that we normally wouldn't have closed. The contracting has gone up as well. As well as the digital field devices, bringing technology in. We're now traveling a bit farther to get to new sites. All of this is making the price per closure go up a bit.

Expected 2018 contractor work:

Hard Closure Projects

Arden (Completed)

- 47 hard closures on County and BLM land

Broken Hills

- 40 hazards Mineral County

Tungsten Mountain Closure Project

- Some BCC's completed in 2017, the 11 remaining sites to be completed

Fort Churchill

Gold Butte AML

- 42 hazards in the new National Monument
- $165,000 of funding from Clark County Desert Conservation

Inventory and Fencings projects

Gold Point, fencings in the area after 2018 summer intern loggings

Shoshone, Inventory and Fencing

White Pine, Fencing

Walker River State Park

MGL Mine

Rich DeLong: Sounds like it was a great year. This is really good for the state.

B. Development and delivery of Minerals Education and AML lessons in Southern Nevada. Field Specialist Aubrey Bonde will present lesson plans and a summary of 2017 activities.
Aubrey Bonde: Gave a PowerPoint presentation.
Here is an example of the lesson plan that we provide to the teachers:

Grade Level & Duration: Kindergarten & 50 minutes

Description: This activity demonstrates the ability of people to use natural materials to meet their needs.

Goals: Students will understand how people extract and use Earth's materials and the suitability of those materials for different applications.

Objectives: Students will use natural materials (e.g., straw and wood) and mined, processed materials (e.g., brick) to build model homes and then test the durability of each of the materials as a use in construction.

Background: Lesson can begin by reading the story of the Three Little Pigs. Then talk about each of the materials they used. Straw comes from dried stalks of grain, sticks come from trees and are made of wood, bricks are processed sand and clay that is baked to become hardened. Talk about if we currently use straw, wood, and bricks as uses for homes. Then test why we would use each following the activity below.

Standards:

Science and Engineering Practices	Crosscutting Concepts	Disciplinary Core Ideas	NGSS	NVACC
Engaging in Argument for Evidence **Planning and Carrying Out Investigations** **Developing and Using Models** **Obtaining, Evaluating, and Communicating Information**	**Systems and System Models** **Interdependence of Science, Engineering, and Technology** **Influence of Engineering, Technology, and Science on Society and the Natural World**	**ESS2.B.** Biogeology **ESS3.A.** Natural Resources **ESS3.C.** Human Impacts on Earth Systems **ETS1.A.** Defining and Delimiting an Engineering Problem	**K-ESS2-2.** Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. **K-ESS3-3.** Communicate solutions that will reduce the impact of humans on land, water, air, and/or other living things in the local environment.	**RI.K.1.** With prompting and support, ask and answer questions about key details in a text. **MP.2.** Reason abstractly and quantitatively. **MP.4.** Model with mathematics.

Here is what the new NDOM Geoscience lessons look like:

Grade	Lesson	Adaptability
Kinder	The Three Little Pigs: Building Materials	1st
1st	Rolling along the Rock Cycle	2nd –Middle
2nd	What am I made of?	4th – 5th
3rd	Minerals Role in Fossilization	1st – 5th

4th	Earth and Human Activity	5th – High
5th	Minerals and their Products	4th – Middle
Middle	Minerals Identification and Social Utility	High
High	Nevada's Minerals and Reserves	Middle

Learning techniques- We use a variety of techniques to engage students of all learning types.
We have interactive presentations, hands-on activities (manipulative objects, maps, books, activity pages, mineral and rock hand samples, mineral testing tools, etc.), group work and group presentations.
Lesson development- Lessons are designed to be flexible in addition to adaptable.
For example, a teacher may just provide grade level and leave the content up to us, although if they are specific in their content we can use these lessons to pluck information from and meet their preferences.
Efficacy of the lessons- Teachers have used the lessons for their activity grades for that day. We have had extremely positive feedback from teachers. We are already booking lessons for next school year. The number of classroom presentations has increased.
Plans for the future- Reach out to more Middle Schools and High Schools and more rural schools. We will be updating lessons and creating additional novel activities.

Rich DeLong: How many High School (HS) and Middle School (MS) in Clark County?
Aubrey Bonde: At least a thousand total schools, I think. We definitely have room to grow with many more schools to reach out to.
Rich DeLong: It's great to see these numbers increase for outreach, it's really important
Dave Parker: It seems that HS and MS is a critical ages why is the emphasis on grade school?
Aubrey Bonde: There is a lot less emphasis in HS and MS, they've got this standard that they have to hit during the school year. They have geoscience classes, but it's more of an elective. And rarely, in Clark County is there a geoscience teacher. There just isn't enough emphasis on the geosciences.
Dave Parker: Don't you bring in a lot of Chemistry, such as what are these rocks made of?
Aubrey Bonde: I've been gathering information for biology teachers. The Environmental Science teachers are probably going to be the pathway into the geoscience.
Rich DeLong: Mr. Bain just Googled how many schools there are in Clark County, it is 336. If we are hitting 250 per year, we are getting most of them. This is really impressive.
Aubrey Bonde: 250 is the total number of presentations. This year I've been in over 40 schools, which leaves a lot more to do.
Dennis Bryan: What is a rule of standards on slide 3 mean?
Aubrey Bonde: Nevada's science standards adhere to the Next Generation Science Standards (NGSS). Nevada academic standard. Cross cutting standards and how we incorporate the STEM.
Dennis Bryan: These are the standards that teachers must teach their children?
Aubrey Bonde: Yes. There isn't a lot of geology in the standards, so this curriculum connects the geo into the standards.
Mary Korpi: Great job. Are the lesson plans and materials available on our website?
Aubrey Bonde: Not yet, but we are looking to put them on our website or NVMA's website. We try to collaborate with them.
Art Henderson: (This question is for Rich) In Tonopah, we talked about education of oil and gas and hydraulic fracking. I don't see anything about that here. We focused on Las Vegas because it is the area that has the most people here that were opposed to fracking. We said we were going to focus on the students, especially HS students because they will become voters very soon. I don't see anything in this program.
Rich Perry: The first activity we are developing is from Courtney Brailo. She is putting together an exercise for the Teachers Workshop on oil drilling with hydraulic fracturing. She's working on that now and should be ready for the July workshop in Reno.
Art Henderson: You're showing plastic in the "identifications/what am I made of", but you can't mine that. Plastic comes from oil. You could go a few extra steps and show some things that are from oil. We should include products from oil.

Dennis Bryan: When you talk about plastic you don't say it comes from oil?
Aubrey Bonde: We talk about them being from petroleum products but we don't go into it much.
Art Henderson: When we had our public hearing here on fracking, the room was packed. The people in this area I believe misunderstand what fracking is about. We must introduce them to our program, and you say you have a plan to do that. It was a priority to educate the public and I just don't see that it's being done.
Rich Perry: The exercise at the teacher's workshop is a geothermal one for the past couple of years. We will get the new oil drilling one rolled out at the teacher's workshop first and then continue to add to it.
Art Henderson: The whole purpose of this is because we understand at the next Legislative session we are going to face the same story as we did before and now we've lost nine months of education.
Dennis Bryan: The latest National Geographic magazine is on plastic, and it's very negative. There is a lot of education that needs to be done.
Nigel Bain: congratulations on a good program, Aubrey. These comments are not a reflection on your efforts.

C. 2017 Nevada Mineral, Geothermal and Oil production statistics. Production data is due from all Nevada producers by April of each year. Mike Visher will present the first look at 2017 production for the State.
Mike Visher passed out a press release, on silver, copper and gold production for the state in 2017. We are up 3.2% for Gold. We did slip in the global ranking from 4th to 5th. He went through the production numbers in more detail which were provided in the commission packets and available to the public.

D. 2019-2020 biennium budget development. Development of the next biennium budget will begin this July. Rich Perry will present the major initiatives funded in the existing budget and is seeking input from the CMR on priorities for the next biennium.
Rich Perry: gave a PowerPoint presentation.
Recap of 2018-2019 Budget-
Personnel
- Moved vacancy and hired Field Specialist in Las Vegas
- F/T staffing at 11
- Legislature approved salary caps for 4 unclassified positions

Special Projects
- NBMG 2-year agreement for reports and archiving $85K/yr
- NvMA Teachers Workshop supplies and buses - $15K/yr
- PDAC Trade Booth – $25K/yr + travel (2018 was 1st year)
- 2 new portable trade show booths - $18K
- 2018 was last year of MSM $2 claim fee - $359K

AML Enhancement – Hard closure work
- 2018: $488K - $150K reimbursed = $338K
- 2019: Forecast: $417K - $192 reimbursed = $225K

PERFORMANCE MEASURES	2014	2015	2016	2017	2018P	2019
ACTIVITY: *OGG Well and Resource Regulation*						
MEASURE: Percent of OGG Wells inspected per year	99.64%	33.69%	60%	48%	41%	41%
GOAL: 33% of all wells in state inspected per year						
ACTIVITY: *Mining Regulation and Fluid Management and Reclamation*						
MEASURE: Percent of Hazardous Abandoned Mine Openings Secured	79.06%	80.40%	80.97%	80.88%	80.00%	81.02%
GOAL: > 70% annually						

ACTIVITY: *Mining Regulation and Fluid Management and Reclamation*						
MEASURE: AML AND MINERALS EDUCATION PRESENTATION PER YEAR	196	192	252	345	386	220
Goal: 20 per year per employee average						

Budget Assumptions for Biennium July, 2019-June 202-
Personnel
- No change at 11 F/T employees and 8 summer interns

Special Projects
- Continue with $85K/yr. deliverables with NBMG
- PDAC trade booth + travel for 2-3 ~$38,000/yr.
- Continue annual funding for Teacher Workshops at $15K/yr.
- New professional Stay Out, Stay Alive video (HD) and Public Service Announcements ~$110,000

Fleet Services for truck replacements
AML Enhancements (contracted hard-closure work)
- Estimate our upper capacity at appx $500K/yr. (5 projects of avg. $100K each)

Hardware/Software/GIS - $22K in FY 2020, $25K in FY 2021

Options to evaluate when building the budget-
Performance measures
- Ideas from CMR on what else should be measured?

Additional AML hard-closure contracted work each year to keep reserve at minimum ~$950K
Assumptions of number of claims
- In last budget we assumed declining number of claims

Other ideas for discussion
Rich Delong: I was wondering about capacity and limits of capacity. What would be the next step to take to move farther? Is the limit because we only have one contractor to do the work, do we need to find another contractor to help ramp it up? Or is it that we don't have enough staff to manage the additional issues that go along with the hard closures, or both?
Rob Ghiglieri: One of the biggest constraints we have isn't what we can do internally. It is the approval process for cultural resource surveys by the BLM or Forest Service. We've been working on this list of closure projects that have probably a couple million dollars' worth of projects and I may submit a request to do these 2 years in advance. It's more of a logistical process to get an approval. There are a few projects that are coming down the pipeline that will be a little more expensive because they are in the Virginia City area. There is a lot more work there due to historical preservation and that will be a different closure.
Rich DeLong: What I'm hearing is this is a pipeline issue not a capacity issue from the Division. The real bottleneck is actually the BLM or the Forest Service.
Rob Ghiglieri: We like to inventory everything in the entire area so it's one area and done. Instead of piece-mailing them, and having difficulty finishing inventory beforehand. We are planning for a couple years out so we can do the field work at the same time as inventory.
Rich DeLong: If there was additional staff could we do this?
Rob Ghiglieri: Yes.
Dave Parker: What does our future budgeting issue have to do with any of this? You never know from one year to another whether we are going to see a decrease or increase in number of claims fees?
Rob Ghiglieri: The beauty of a lot of these projects is there is a long grace period of 5 years from when I receive that document to when I can complete the closure work. Even though we have these 5 projects for 2018, if one pops up that needs to be addressed, I may push one back so we can complete this one. It is easier for me to manage the amount of spending this year by what is the highest priority.
Dave Parker: I was just wondering about the issues we always seem to have on whether we are going to increase or decrease the claim fee. If the fee decreases, what kind of planning do you have for that?
Rich Perry: One of the reasons we came up with a general number here is when we do a spreadsheet on revenues and expenditures, we put variable numbers in there to tweak it as to what the claim fee numbers do. They can

change significantly, that way we are modeling it and looking at it from a sensitivity stand point. The Commission had this discussion about two meetings ago about if we should reduce the claim fee. It was decided to run this out for a year and see where we are at. We can look at this in the next biennium. The hard closure work is the way to reduce the reserve if it gets too high.
Rich DeLong: Wanted to make a point on adjusting the claim fee. On purely a logistical perspective, this would be a regulation change. We can't do a permanent regulation change starting from July this year to July next year. We are looking at July 2019 which wouldn't take effect until August 2020. There would potentially be 2 years before we see a change in the fee. Rob Ghiglieri: One other aspect of the hard closure budget is the funding sources that come from outside the claim fee. Such as, we were able to get funding from Clark County for the Arden Project, but outside sources are not guaranteed.
Dennis Bryan: For clarification, we continued $85,000 for deliverable per year to the Bureau. Is the $35,000 for the exploration survey every other year?
Rich Perry: Yes, it is $85,000 total and the $35,000 is part of the $85,000. This fee includes deliverables of the Exploration Survey, MI Report, archiving of OGG cuttings, scanning well logs, mineral industry study or other study per the Commission request.
Rich DeLong: Under the Fleet Service, starting next fiscal year this will be an operating cost with Fleet Services? We aren't buying any trucks; we are going to pay a fee on a monthly basis?
Rich Perry: For the next replacement truck only moving forward, we will be paying a fee to Fleet Services.
Rich DeLong: Have we looked at 519A the Bond Pool regulation for any changes?
Mike Visher: In NAC 519A the last change was building in the cap for the amount to be transferred for the administrative fee. For the bond pool's account there is a separate budget account which is not subject to the budget building process. It is a non-executive budget, We built into it the admin fee transfer cap of up to 3% of the bond amount but, limited to what the actual costs are. The cap is approximately $80-90ka year. Then it is rolled over to our general account. There is potential for some tweaking to be done in the regulations. We talked about reducing the 3% fee to something more appropriate. In regards to how the bond pool works, I haven't heard any complaints or wanting it any different.
Rich DeLong: When you talk about reducing the 3%, do you mean reducing the amount transferred or the 3% charged to the participants?
Mike Visher: Charged to the participant.
Mike Visher: If you look under Staff Reports, there is a graph that will help explain. This is the standard bond pool status report I present at each meeting. One of the key points is on the table at the top, is the total bond amount, cash in the account and the unfunded amount which is our surplus. Right now we have $925,000 in excess of our obligations. That amount allows us to take on liability without bringing the reserve below zero. For any one operator they are limited to 3 million total bond amounts for all operations. The cost to come into the bond pool is determined by a formula. The higher amount you need obligated, the more you will have to put down as a deposit. The remainder will be paid through premium payments, so the bond is whole within 5 years. The statute says that money is only to be used for the administration of the bond pool. The Legislature swept all the interest ever earned in that account as well as the oil, gas and geothermal bond pool account. That was 20 years of accumulated interest that was taken to help balance the State's general fund budget. We need money in that account so we have the ability to write a plan-level bond. Plan-level bonds do not have to put 100% down like the notice-level bonds do. If they leave the bond pool, then they are only refunded their deposit. In this case, the excess of obligations would go over $1 million. Maybe we should have a task force take a look at the fee?
Dennis Bryan: Clarified what Mike said with a scenario.
Mike Visher: There is a cost to administer the bond pool. When I run the scenario and consider the time it takes to administer the bond pool, I take into consideration all the staff that takes care of the bond pool and 3% is about what it costs. The amount we are asking is in line with what we are expending to do these services.
Rich Perry: Add to regulation update. Update language for plan level bonding works. Start reducing the reserve by reducing the fee to participants or attracting more notice-level bonds.
Dennis Bryan: Should we address this at the next meeting?
Rich Perry: I think we should form a team and look at options and present at the final meeting of the year.
Dennis Bryan: I'd like to participate.
Rich Delong: I'd like to be involved.
*Task force- Dennis Bryan, Rich DeLong, Rich Perry and Mike Visher.

Art Henderson: We discussed the possibilities of having public service announcements regarding hydraulic fracking. Do we have anything in the budget for this in the Las Vegas area?
Rich Perry: No we don't, but we did make some swag stickers and pins to start using in the classrooms.
Art Henderson: We previously discussed doing television announcements or billboards? Last legislative session we were without defense.
Rich Perry: There is something that we have been doing and if you recall after that bill left the Assembly where it passed to Senate Natural Resources, by that time there was a much more cohesive discussion of some of the realities for the state, what would happen if the state instituted a ban on hydraulic fracturing. One of the most salient one of those was an informal opinion by BLM solicitor in Washington D.C. that a state ban on hydraulic fracturing would not be enforceable on Federal leases. Nevada is mostly Federal land. By MOU and Interior agreement with State, if the State's regulations are more stringent than the Federal then the Federal permit has to adhere to the State regulations. We can certainly go through and make sure we have some money put aside for educating the public.
Dave Parker: I agree on promoting education on fracking.
Rich DeLong: It would be good idea to have something more formal in preparation for the next session.
Dennis Bryan: We assumed declining claims in the last budget, and then claims went up. What do you think claims are going to do this next year?
Rich Perry: Lithium brine claims have gone down but hard rock claims have gone up. There are lode claims being staked somewhere. Price of gold drives the claims, so I don't see that claims will see a huge decrease.

III. OLD BUSINESS

A. Report on Arden Mine Closure work of portals and hazards at the Arden Mine done by NDOM contractor Environmental Protection Services between April 2nd and April 27th. The work is now completed. Rob Ghiglieri and Garrett Wake will do a presentation on the work performed.
Garrett Wake: Gave a PowerPoint presentation with Rob Ghiglieri. A lot of public interaction went on during this project. The PowerPoint was presented in the Commissioner's binders and was also available to the public.
Dennis Bryan: When you send the scouts out to secure them, how long does the securing's last?
Garrett Wake: It depends, but at this Arden project they would be compromised after a couple of months.
Rich DeLong: This is amazing work.
Nigel Bain: You'll have to monitor the portals; people can be ingenious on re-opening them.
Rob Ghiglieri: When the BLM found their bat gates were compromised they more than happy to help with closure.
Rich Perry: We are going to be putting this closure project in for a couple of awards.

B. Report on the Prospector's and Developers Association of Canada (PDAC) meeting, March 4-7 in Toronto. Nevada was represented by Industry Trade Associations, State Agencies and the BLM in the first-ever Nevada trade booth, which was funded by NDOM. Garrett Wake will provide a report.
Garrett Wake: See PowerPoint presentation. The PowerPoint presentation was provided to Commission and to the public.
Garrett Wake: Went over the impact of the PDAC on Nevada. We saw some increased activity on our website.
Rich DeLong: This has been a long time coming. When I first joined the Commission I brought it up to the Administrator, I think it is very important for Nevada to have a presence at PDAC and to compete with the other states and provinces for business.
Garrett Wake: We did have a lot of people come to our booth and asked why we haven't been at PDAC before. If we don't see numbers in the website hits, we can say we had a lot of visitors at the booth giving us praise for being there.
Dave Parker: Great professional job, next year you should see some better numbers.
Garrett Wake: We don't have any statistics from previous years to compare it to. So hopefully we will see some increase in website activity next year. Maybe we can get a booth in the South Hall next time and will see an increase in traffic.
Rich Perry: It was Garrett and I who went this year. Getting a booth location is a seniority issue, so with time we can get a better spot. We suggested the other agencies do some nighttime events to bring people in.
Nigel Bain: I would encourage Sheldon Mudd to continue to be involved.
Rich Perry: They are actually interviewing for his replacement.

C. NDOM Administrator evaluation by Commission.
Rich DeLong: This is our first formal evaluation of the Administrator. Rich has brought this up on many occasions over the past couple of years as something he wanted to see implemented. The Commission also thought it was a good idea. Asked Mary to go through the process that her and Art went through in compiling the information in regards to the evaluations from each Commissioner. That compilation has been delivered to Rich. We are not going over it specifically but would invite each Commissioner to give their opinion on Rich's performance.
Mary Korpi: Went through a proposed format to make sure there was consistency on seven key areas and receive feedback. We will individually talk about strengths and if there are any recommendations. The one area that has struck me, the communication with Rich and at NDOM is great. The outreach to make sure questions were answered I appreciate. In public presentations, he does a great job on his public presentations. The inclusion in staff in reporting and involvement, and it could easily be all about Rich but he includes the staff and makes it a cohesive effort. The relationship side working with the other agencies and partners in the industry is a driving force for Rich. Nothing ever seems to be up against a deadline. The planning effort is great.
Dennis Bryan: I agree with what Mary has said. He is very knowledgeable about the industry. He has great communication and is respected by the industry. His demeanor with the general public is very professional. People respect what you have to say. I think you're doing a great job.
Nigel Bain: The ability to communicate with the different stakeholders is being done very well. On strategic planning, has a good understanding and supports the Commission and makes sure we don't get into trouble. He does a great job.
David Parker: I agree with everything that is said. I give him kudos for having such a great staff.
Rich DeLong: I'll try and add to what has already been said, there have been spot on comments with regards to Rich's performance. His presentation capabilities and how he interacts with his staff and the Commission the public is commendable. We are highly fortunate to have Rich as an administrator. I can't think of anyone better at this time to have at the Division.

IV. STAFF REPORTS

1) Mining and Reclamation Bond Pool – Mike Visher
Mike Visher: Bond pool is in good health. I've already partially gone over this before. Activity has dropped off a bit since last quarter. The activity is in line with the claims.

2) Administrator Report and correspondence
Rich Perry: NvMA letter from Dana Bennett mentioned in last meeting that she sent over to us on the discussion of Washoe county lands bill. NvMA has formed a Public Lands Committee. The next page is from GBSSRL report for our funding of the cuttings, scanning, etc.… Final page is Lowell's report on Oil, Gas and Geothermal Activity.

COMMISSION BUSINESS

A. Resolution honoring former Commissioners John Mudge and Fred Gibson for their many years of service on the Commission.
Rich DeLong: John started on the Commission maybe 6 months after I did. It was a pleasure serving with John, on many levels he was a mentor and I really appreciate working with him. I was sorry to see you had to leave the Commission. He asked John Mudge to come forward to the dais to present him with a certificate of acknowledgment from the Governor as well as a medallion.
Rich DeLong: The recognition of Fred is bittersweet since he recently passed. It would have been wonderful to present this to him personally. Fred had a unique position with the Commission in serving for so many years and so involved. Governor Richard Bryan appointed Fred in July 1983. Fred served faithfully and continuously for 34 years. And he served as Chairman for over 30 of those years. Fred guided the Commission and the Division of Minerals through a number of organizational changes into the current structure as a state agency. He oversaw the development of the geothermal regulations, the Abandoned Mine Lands program, as well as the fracking regulations. The Commission and the Division are deeply indebted to Fred for his dedication to the mining industry and his service to the Commission. Maureen, his granddaughter, is here to accept his award. He invited Maureen to the dais to accept Fred's award.

COMMENTS BY THE GENERAL PUBLIC

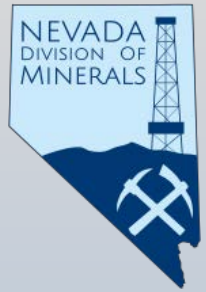
Garrett Wake: McCaw School of Mines is having their annual golf tournament June 9, 2018. It's a big event in which they raise money to help provide buses for kids to come visit the school of mines.
John Mudge: Thank you for that nice recognition and more especially working together and all the great things we were collectively able to accomplish. Three things come to mind that I'd like to name. Emphasis on the AML closures and great work from staff, that program is really remarkable. I'm obviously proud of the support that we could give Mackay for 10 years that is pretty special. Lastly, one of the huge things we did is finding and hiring of Rich was a great accomplishment. Thank you for letting this public person speak.

Determination of time and place of next CMR meeting
Eureka- August 23rd and 24th 2018. At the Eureka County Courthouse.

ADJOURNMENT 4:21 PM

II. NEW BUSINESS

II. A Northern Nevada Education Activities.

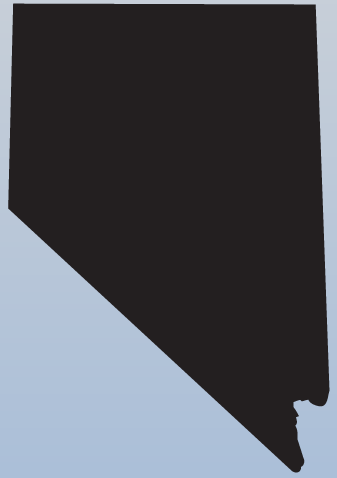


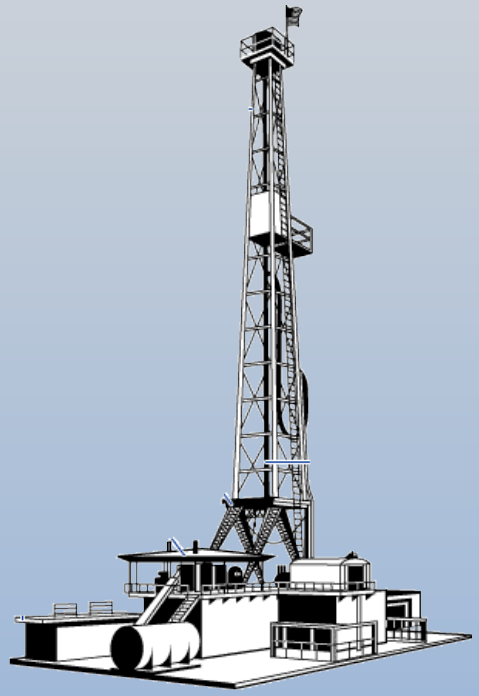
NDOM Education Outreach

Northern Nevada & Teacher's Workshops

Presentation by Courtney Brailo

Development of New Activities





- Oil, Gas & Geothermal Activity
  - Exploration to Production activity
  - Nevada based example
  - Geology-based
  - Includes resource feasibility understanding
  - Hydraulic Fracturing demonstration

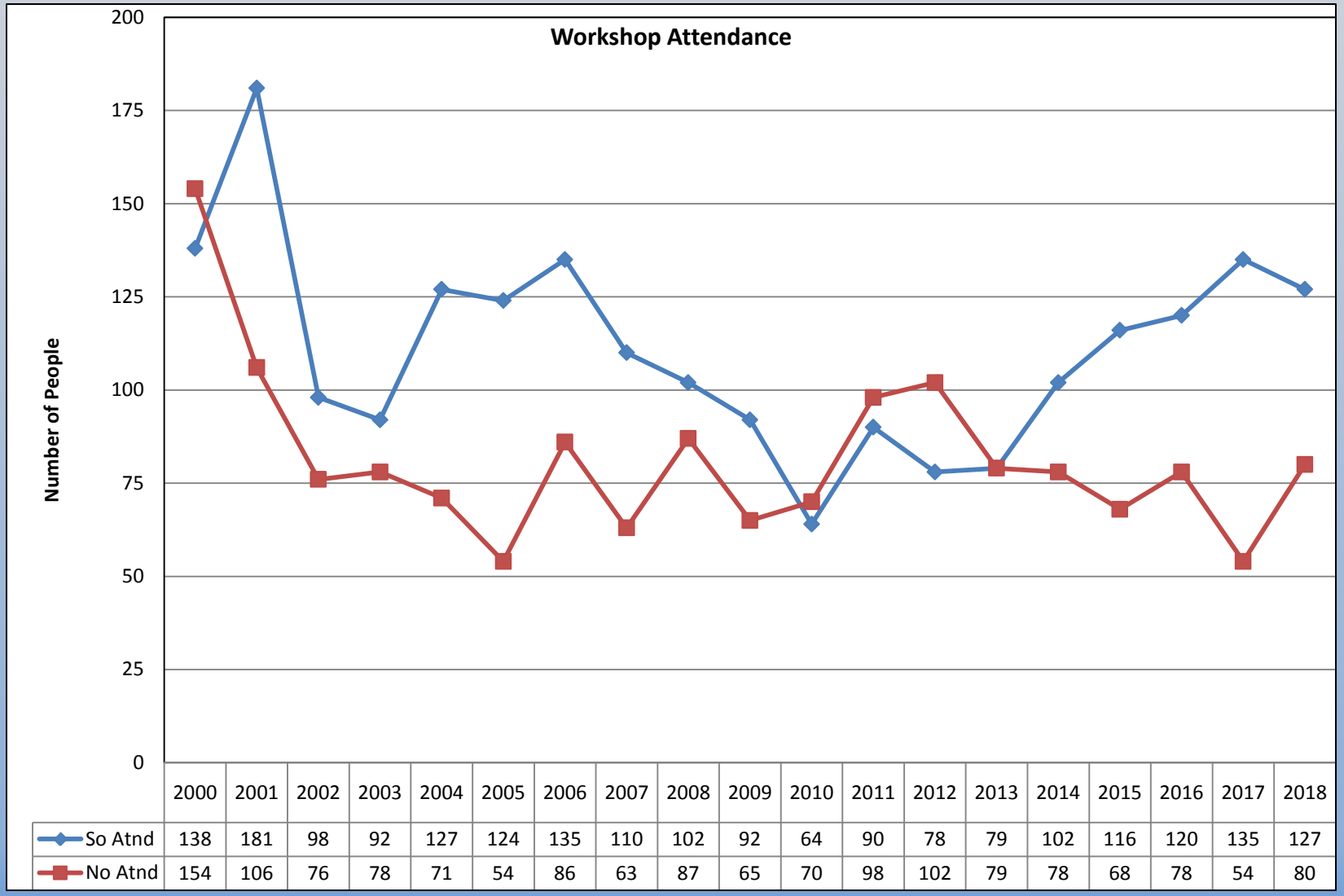
Teacher's Workshops

- **Northern Nevada Workshop (Reno) July 16-18**

- **Day One:** Mineral & Rock basics *(R. Ghiglieri),* with an advanced option *(L. Patterson, C. Brailo)*
  - *Geology Tours*
- **Day Two:** Mixed Mining & Geology Topics
  - *Mining Tours*

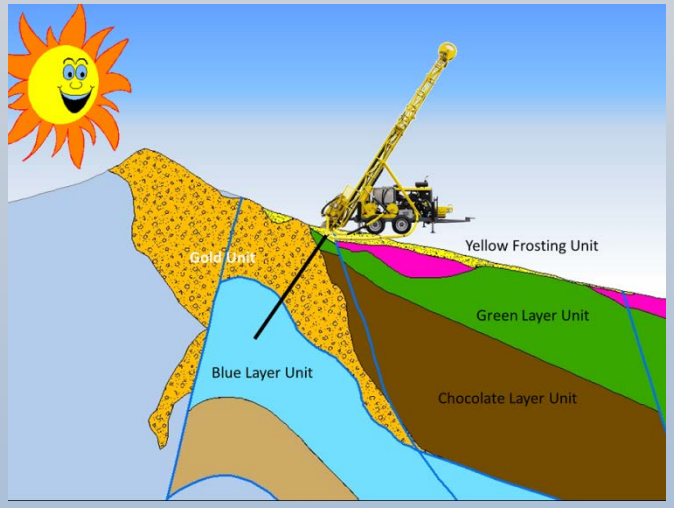
- Give away all classroom resources as prepackaged activities and each teacher gets a swag bag they can use in their classrooms

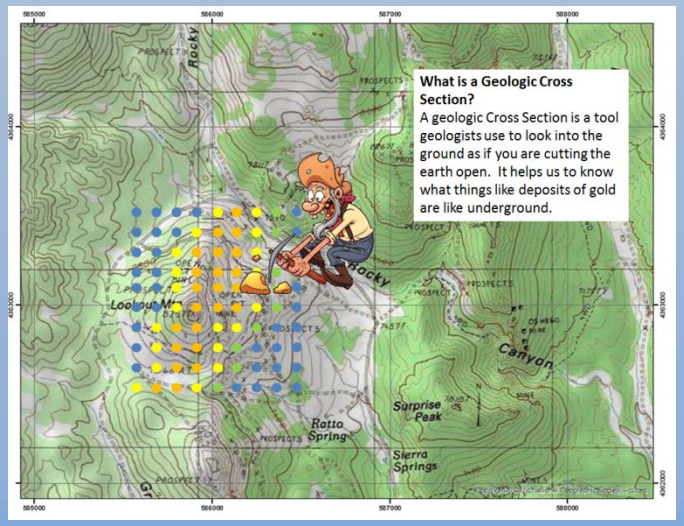
Total Number of People Reached



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
So Atnd	138	181	98	92	127	124	135	110	102	92	64	90	78	79	102	116	120	135	127
No Atnd	154	106	76	78	71	54	86	63	87	65	70	98	102	79	78	68	78	54	80

Classes & Sessions





- **Oil and Gas Session -** *added this year*
  - Outcrop mapping, basin analysis – exploration to production methods at Railroad Valley, NV

- **Cupcake core drilling –** An exploration and mining activity very popular at schools and teacher's workshop *(L. Patterson)*
  - Mineral Uses
  - Drilling and drill rig types
  - Development of cross sections from drill hole samples
  - Mining in Nevada
  - Commodity Use
  - Number of people employed at Nevada's mines
  - Locating the major mines on a Nevada Map

Other Notable Classes & Contributions

34th Annual Northern Nevada Earth Science Education Workshop 2018
Class/Session Plan Chart For Tuesday and Wednesday updated 06/18/2018 vk

Room#	Tuesday Session 1 8:25 – 10:10 a.m.	Tuesday Session 2 10:20 - 12:05 a.m.	Wednesday Session 3 8:30 – 10:00 a.m.	Wednesday Session 4 10:10 – 11:40 a.m.	Wednesday Breakout Session 11:40 AM – 12:25 PM
B-13	**Minerals** K-8 DD	**Rocks and Geology** K-8 DD	**Mineral Use** 4-8 DD		
B-15	**Minerals- LVL 2** Advanced Lucia P./Courtney	**Rocks and Geology-LVL 2** Advanced Lucia P./Courtney	**Geologic Time and Fossils** K-8 Lucia P./Courtney	**Cupcake Core Drilling** 6-12 Lucia P./ Rob G.	
B-9	**Minerals** K-8 Terry/Rob G.	**Rocks and Geology** K-8 Terry/Rob G.	**Natural Disasters** 5-12 Maureen L.	**Build a Mine** 4-12 Joe/Terry	
B-16				**When Rocks Sing- Petroglyphs** K-6 Maria	
B-7			**History of Mining** K-6 Sam	**Edible Geology** K-6 Sam	
B-12			**Nevada's Natural Resources** K-12 Patti	**Extraction: Where do Au, Ag, and Cu come from?** 5–8 Ginger/Beth	
B-11	**Minerals** K-8 Rachel M	**Rocks and Geology** K-8 Rachel M	**Plate Tectonics** 5-12 Rachel M./Garrett W.	**Drilling for Energy** 6-12 Courtney B./Garrett W.	
B-10	**Minerals** 9-12 Jon P	**Rocks and Geology** 9-12 Jon P	**Critical Elements of Energy** 6-12 Jon P		

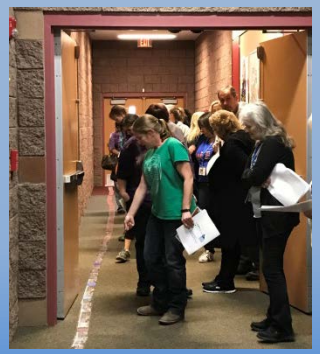
Day 1 Tours	Description	Tour Guide	Day 2 Tours	Tour Description	Tour Guides
#1	Local Resources	Sam and Terry	#1	Martin Marietta- EP Minerals	Joe, DD, Courtney
#2	Museum tours	Rachel and Courtney	#2	Nevada Cement- Q&D	Terry and Sam

- NDOM:
  - Build a Mine: Economics of Mining & Mine Development for younger grades *(R. Ghiglieri)*
  - Geologic Time – Comprehensive instruction with multiple activities *(L. Patterson)*
  - Plate Techtonics *(G. Wake)*
  - Geothermal: Build a powerplant *(replaced by OGG)*

- Other Contributors (NMA, volunteers, sponsors)
  - Critical Elements of Energy
  - Nevada's Natural Resources
  - History of Mining
  - Extraction: Where do Au, Ag, Cu come from?

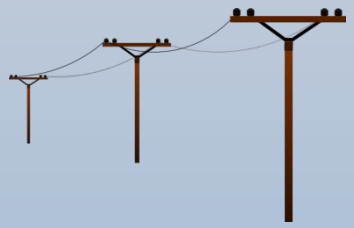
- NDOM
  - Tote Bags
  - Hand Lenses & Lanyards
  - Rock and Mineral Samples
  - Mineral Test Kits
  - Mineral ID Books
  - Lunch Bags
  - Posters
  - Pencils
  - Stickers
  - Buttons
  - Element Bookmarks
  - Prizes - Microscope

- Other:
  - Gold Splatter
  - Sunscreen
  - Chap Stick
  - Water Bottles

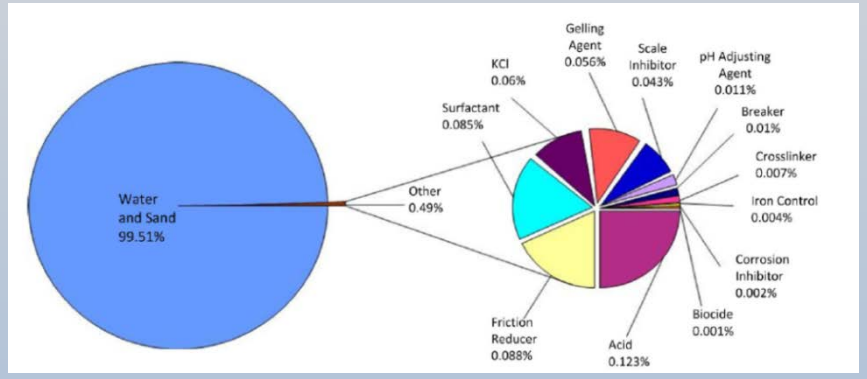


Oil, Gas and Geothermal Activity

- Introductory Presentation
  - Why do we need oil, gas and geothermal?
  - What do we use these resources for?
    - **Products, energy and JOBS!**
  - Where our resources come from
    - Heat/permeability – Geothermal
    - Biologically rich 'cooked' deposits – Oil and Gas
  - Methods by which we explore and produce from these resources
    - Geologic mapping, drilling and feasibility studies
    - Creation of Well Logs, Stratigraphic Columns, Cross Sections, 3D modeling
    - Types of Drill Rigs, Reverse Circulation vs Core Rigs
  - Conventional vs non-conventional resources and traps for oil and gas
    - Natural pressurized flow with minimal pumping
    - Well stimulation and hydraulic fracturing of low permeability reservoirs



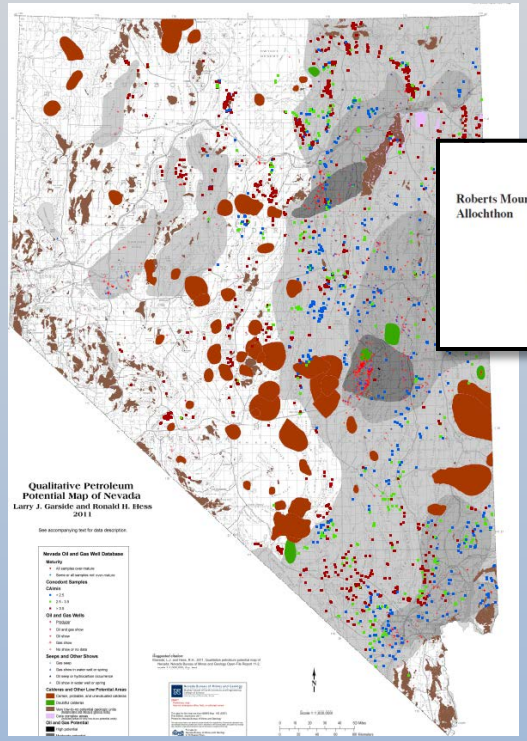
Oil, Gas and Geothermal Activity

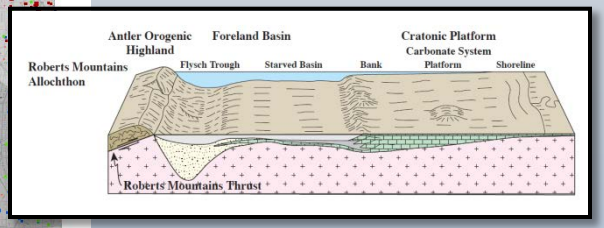


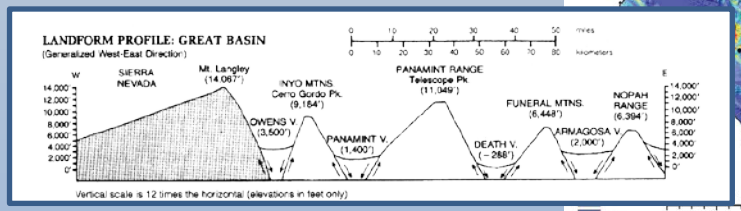
- Introductory Presentation
  - Non-conventional benefits and misconceptions
    - Depths of resources
    - Use of water as compared to other practices
    - Minimal use of chemicals and NV regulator ability to not allow for use of any particular chemical
    - Efficiency and cleanliness of oil and gas as compared to coal
    - Induced seismicity – rare and deep, can limit the rate of re-injection
    - Nevada's existing laws and regulations – Cement bond logs & Plugging and Abandonment
  - Hydraulic Fracturing

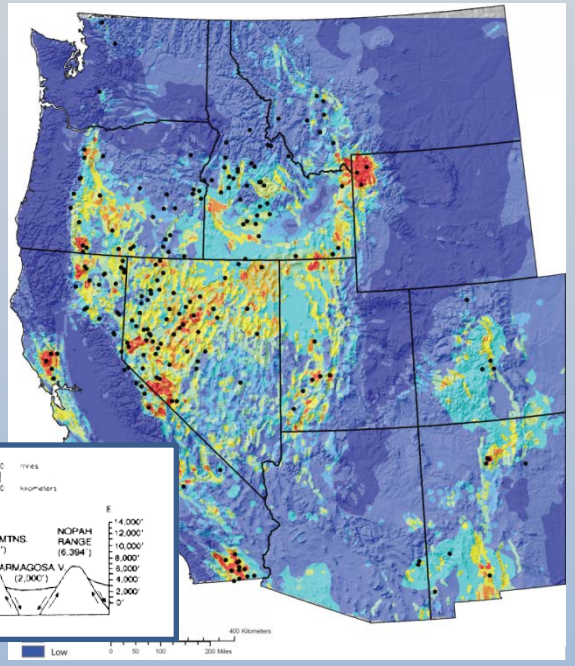
- Where did the technology stem from? Need to minimize dependence of foreign oil – oil crisis of 1973
- Perfected technique in the 1990s
- We have many resources here in the US! Texas, North Dakota, Colorado and Pennsylvania
- This year for the first time we are net exporters of petroleum and petroleum products!

Why is Nevada so rich in energy resources?





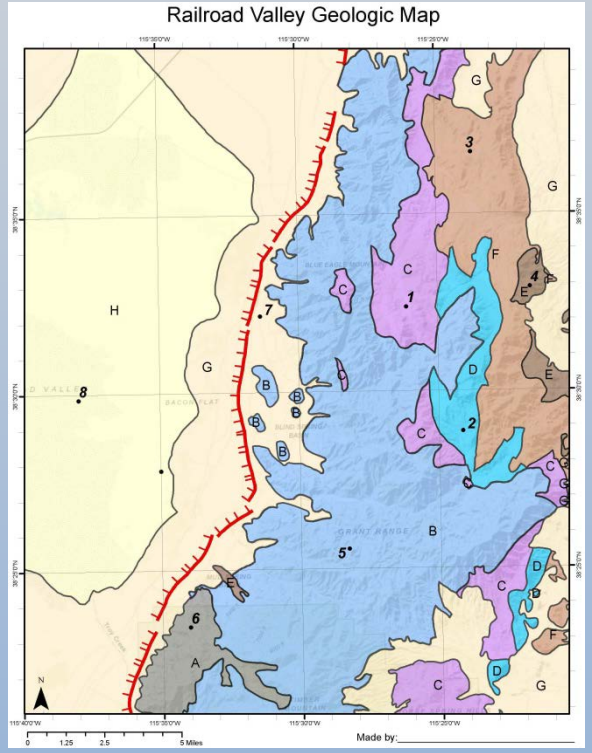


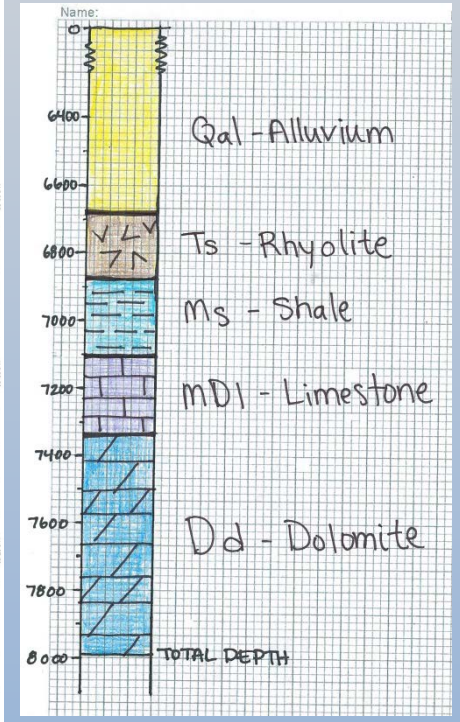


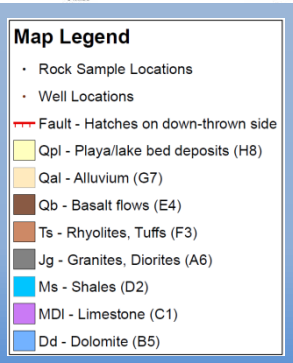
- Oil & Gas: Paleozoic Limestones & Shales
- Geothermal: Basin and Range Extension & Walker Lane Strick Slip
  - Began in the Tertiary (40-30 million years ago)

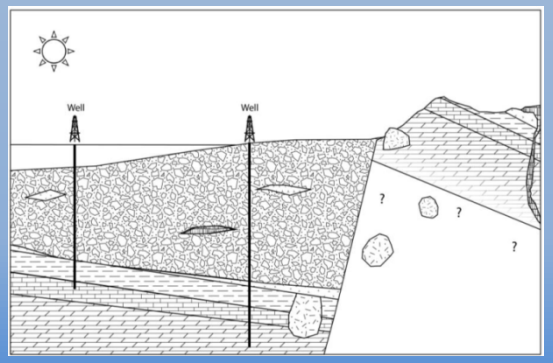
Exploration & Drilling Activity
Railroad Valley, NV

- Rock Identification
  - Limestones, Dolomites, Shales, Rhyolites, Basalts, samples in class and included in their rock boxes
- Creation of a Geologic Map and Locating Collection sites
- Understanding and creating Well Logs
  - from wells drilled at Bacon Flat
- Understanding cross sections and making simple geologic interpretations



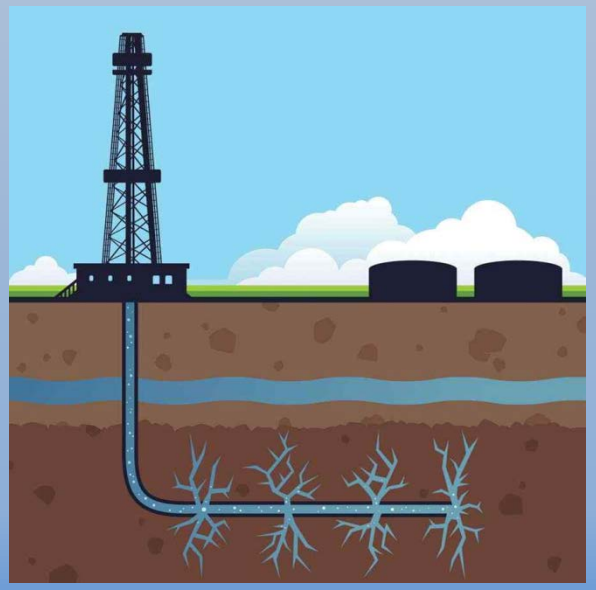






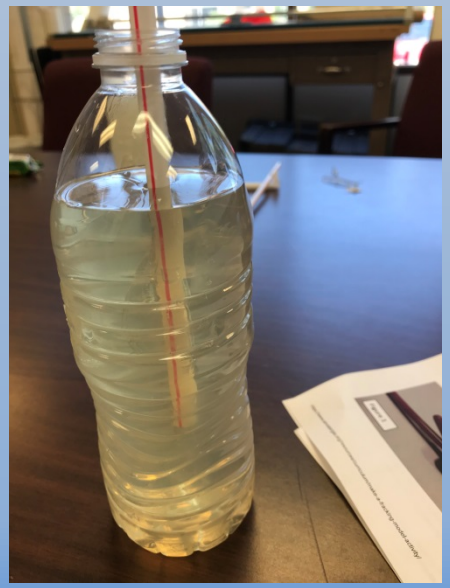
Exploration & Drilling Activity Railroad Valley, NV

- Feasibility studies
- Costs of Drilling and Permitting
- Price of oil/gas
- Generated Revenue – Costs to Drill
- How can you increase production?
- What if you don't have a permeable reservoir rock, what are you options for producing hydrocarbons from that reservoir?

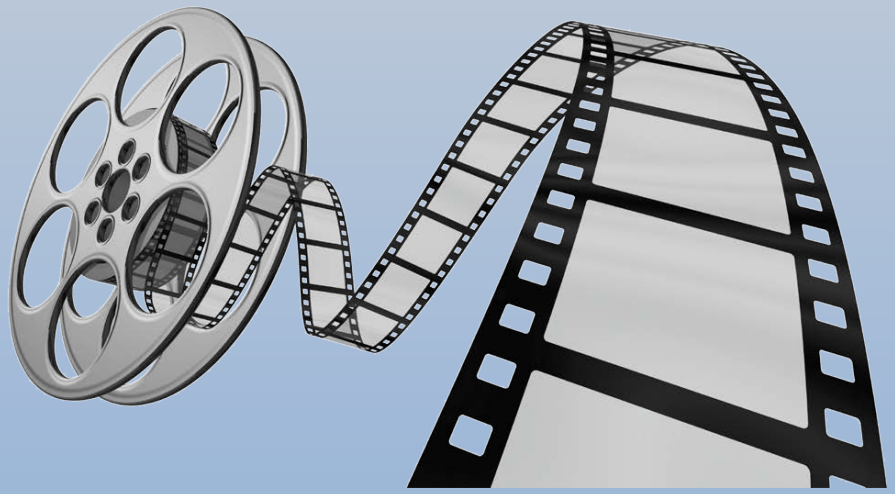


Hydraulic Fracturing – Hands on Exercise

- Understanding the basics behind the method
- Uses gelatin as medium (limestone, dolomites, shales)
- Straw = Core Rig, Casing String
- Syringe/Plunger = Hydraulic Fracturing Rig
- Plaster of Paris = Proppant and HF fluids

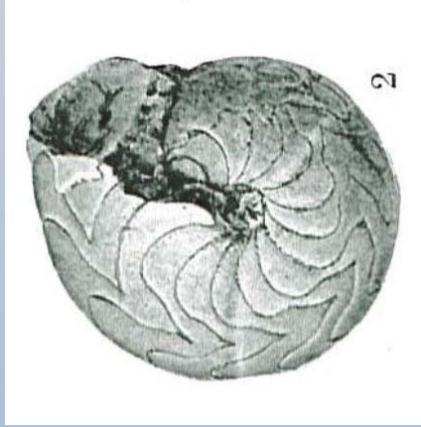


Hydraulic Fracturing Classroom Activity



Play Video

Railroad Valley Resources where discovered in this way



- This kind of exploration and mapping is how we know there were inland seas in NV
- 1948 PhD Thesis by Walt Youngquist – studied cephalopods, some of which contained oil pockets
- Shell became interested and in 1954 discovered oil
- Now the basin has 9 recognized oil fields and has produced over 47 million barrels of oil
- Early wells were the largest producers in the country at the time
- Due to new technologies and discoveries we are now the 27th of 30 oil producing states

Tours

- **Geology**
  - Resources for teachers
  - Reno Museums
    - Discovery
    - Keck
    - NV Historical Society
  - Bureau of Mines and Geology
  - National Weather Service
    - Balloon Launch
- **Mining**
  - EP Minerals
  - Martin Marietta
  - NV Energy Tracy Plant
  - *Last year (rural NV): Barrick Gold, Newmont, Silver Standard*

Other NDOM outreach Northern Nevada

- **Classroom presentations** *(L. Patterson, C. Brailo)*
  - Cupcake Core Drilling (~4th Grade)
  - Geologic Time Scale (2-5th grade)
  - The Rock Cycle (~2nd Grade)
  - Weird Rocks (~K-1st grades)
  - High School Presentations
- **4th Grade Mail Out – Project-based learning module** *(R. Ghiglieri, C. Brailo, L. Patterson)*
  - Abandoned Mine Campaign
  - History of Mining in Nevada
  - Core Drilling
  - Best Campaign Project 4th grade class @ Alice Maxwell Elementary, Sparks
  - To be completed at new Sparks school
- **Career Fairs / Career Days – All Grades** *(All Staff)*
- **Special Events – Farm Days, Nevada Day Celebrations, Association Meetings** *(All Staff)*
- **Northern Nevada Totals:**
  - 2017: 128 presentations (5302 attendees)
  - 2018: 66 presentations (3540 attendees)

Questions?

II. B Summary of oil, geothermal and dissolved mineral resource drilling

Summary of Oil, Geothermal, and Dissolved Minerals Activity 2017 and 2018

Recent Leasing of Federally Managed Lands

Commission on Mineral Resources Meeting
August 25, 2018

Lowell Price
Fluid Minerals Program Manager
Nevada Division of Minerals

Geothermal Drilling – 2017: 29 Wells

Temperature Gradient Wells: 15

- City of Wells: 13 (Geoprobe)
- Ormat Nevada, Dixie Valley: 2 (Core)

Observation Wells: 4

- US Geothermal, San Emidio: 3 (deepened reclassified TG wells)
- City of Wells: 1

Production Wells: 5

- Ormat Nevada, Tungsten Mountain: 1
- Ormat Nevada, McGinness Hills: 3
- Homestretch Geothermal, Wabuska: 1

Injection Wells: 3

- Ormat Nevada, Dixie Meadows: 1
- Ormat Nevada, McGinness Hills: 1
- Ormat Nevada, Carson Lake: 1

Domestic Wells: 2, Reno Moana Area, 1 Production, 1 Injection

Geothermal Drilling – 2018: 20 Wells

Temperature Gradient Wells: 15

- NBMG, Granite Springs Valley: 9 (Geoprobe)
- NBMG, Gabbs Valley: 6 (Rotary Drilled)

Observation Wells: 2

- Ormat Nevada, Carson Lake (FORGE): 1
- Ormat Nevada, Tungsten Mountain (P&A after conductor): 1

Production Wells: 3

- Ormat Nevada, McGinness Hills: 2
- Ormat Nevada, Tungsten Mountain: 1

Injection Wells: 0

Domestic Wells: 0

Oil Exploration Drilling – 2017 and 2018: 2 Wells

True Oil, Railroad Valley: 1

Spudded DY Federal 13-31 in December 2017, P&A January 2018

Major Oil International, Hot Creek Valley: 1

Spudded Eblana 3 in April 2018, completed drilling May 2018

Currently in extended testing program

Wells Permitted, Not Drilled: 3

Makoil, Railroad Valley, Munson Ranch 12-23X

Major Oil International, Hot Creek Valley, Eblana 6

Envy Energy, Northern Railroad Valley, Black Point 1

Federal Leasing - Geothermal

- Last annual statewide lease sale was held on October 24, 2017.
- 20 parcels totaling 38,208 acres were offered.
- No acreage was deferred from the preliminary list of parcels due to sage grouse.
- 10 parcels totaling 19,208 acres were sold.
- Total receipts for the October 24th sale were $78,444
- Next lease sale will be on October 26, 2018.
- Sale notice and parcel listing for the October 2018 sale have not been published.

Federal Leasing – Oil and Gas

- Last lease sale was held on June 12, 2018, for the Battle Mountain District.
- 166 parcels totaling 313,715 acres were offered.
- No acreage was deferred due to sage grouse.
- 40 parcels in total were sold. 22 parcels were sold in the competitive auction, covering 38,575 acres, along with 18 parcels, consisting of 36,755 acres, selling on a non-competitive basis, totaling 75,330 acres.
- Acreage for the June sale is located in Nye, Eureka, and Lander (one 614 acre parcel) Counties.
- Total receipts for the June 12th sale were $201,290.50.
- Next lease sale will be on September 11, 2018, and will cover 144 parcels, or 295,174 acres, within the Ely BLM District. The acreage is located in White Pine, Eureka, Lincoln, Elko, and northern Nye Counties. Elko County has one 480 acre parcel.

Dissolved Minerals Activity - 2018

Five dissolved minerals exploration well permits have been issued by the Division

- Sierra Lithium, Columbus Salt Marsh: two permits, one well was drilled and plugged
- Sierra Lithium, Clayton Valley: two permits, one well was drilled and plugged
- 3PL Operating, Railroad Valley: one permit, one well drilled and remains open for testing

Four borehole Notices of Intent (NOI) approved by the Division

- Mathers Lithium, Clayton Valley: drilled and plugged
- Bonaventure Nevada, Sarcobatus Flat: drilled and plugged
- Belmont Resources (two NOI's), Monte Cristo Valley, one of two boreholes was drilled during August 2018

Upcoming activity: working with Lithium Ore on either their first borehole NOI or exploration well permit for their drilling project in Railroad Valley

FY 2018 OGG Inspections

FY 2018 Well Inspections	Total Wells	Wells Needed for FY18	Wells Inspected	% of Total Needed	Wells Remaining
Geothermal (33 Locations)	457	152	244	160.5%	-92
Oil (24 Locations)	119	40	127	320%	-87
Totals	575	192	371	194%	-179

FY 2018 DMRE Inspections

Operator	Permit Number	NOI Number	Location	Number of Visits	Reason for Visit
Sierra Lithium	W0001		Columbus Salt Marsh	2	Drilling & Plugging
Sierra Lithium	W0004		Clayton Valley	2	Drilling & Plugging
3PL Operating	W0003		Railroad Valley	2	Cement Casing & Testing
Mathers Lithium		N0001	Clayton Valley	1	Verify Plugging
Bonaventure Nevada		N0002	Sarcobatus Flat	2	Pre-drill & Drilling

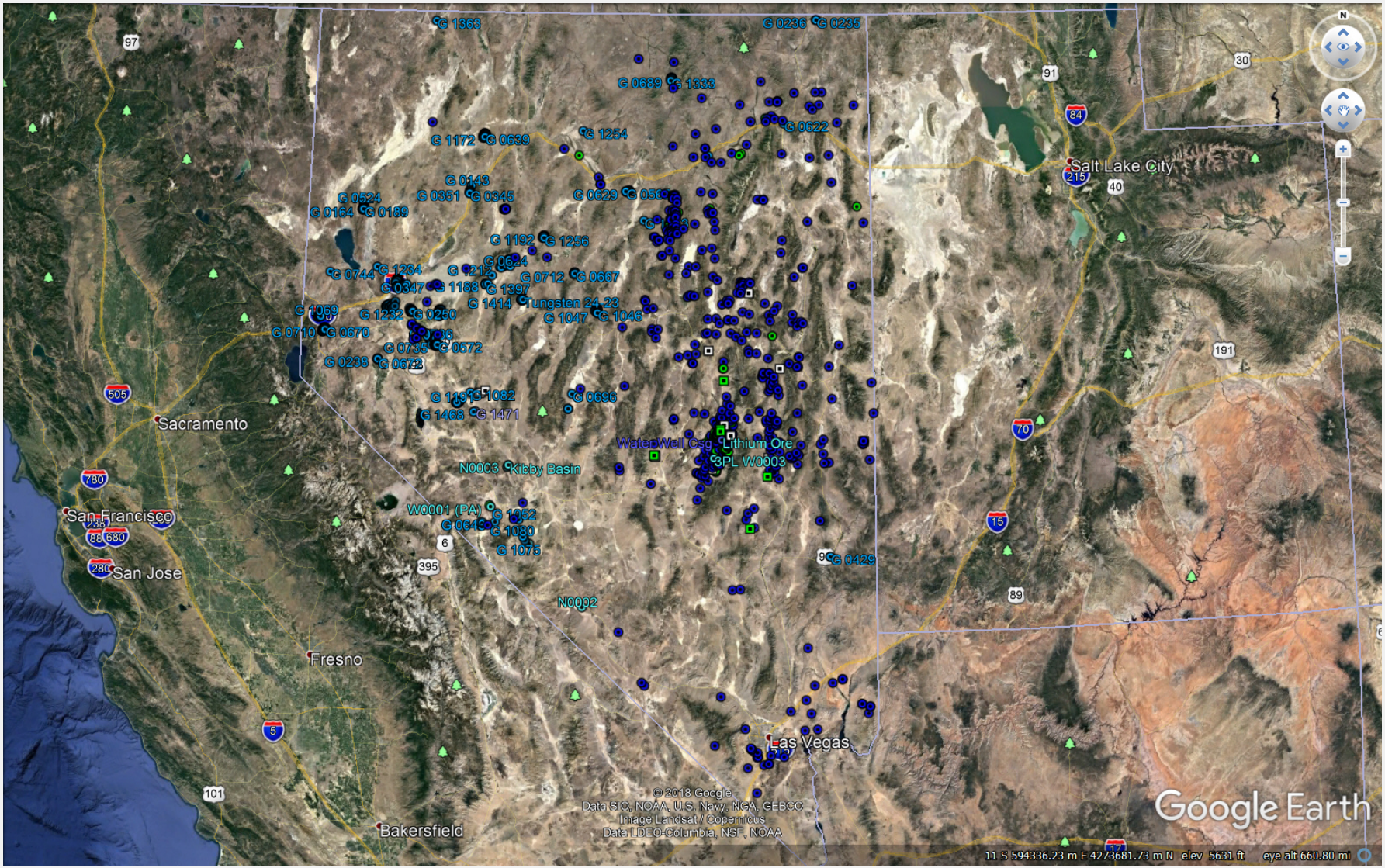
Oil & Gas Database

Permit	UTM East	UTM Nort	BLMLease#	Well	Status	ActiveFieldN	WellAlias	API	Permit Issue	Well Type	Operator	Field	Permit E
0070			57499	Palawan 1	Expired	No		27-011-05001	8/14/1963		Palawan Oil Company	EXP	8/14/1965
0071	628229	4273155	42341	Eagle Springs 74-35	Shut-In	Yes		27-023-05013	1/30/1964	Prod	Kirkwood Oil & Gas	ESP	1/30/1966
0072	358120	4402650		Carson Sink 1	Plugged	No		27-001-05061	2/17/1964	Prod	HB Thorpe	EXP	2/17/1966
0073	628320	4272830	12321	Eagle Springs 85-35	Plugged	No		27-023-05014	3/30/1964	Prod	Texota	EXP	3/30/1966
0074	621560	4338917	55981	Nevada Federal A-1	Plugged	No		27-033-05005	4/3/1961	Prod	Suntide Petroleum	EXP	4/13/1963
0075	670120	4286840	62362	Federal 1	Plugged	No		27-033-05001	8/19/1964	Prod	Empire State Oil Company	EXP	8/19/1966
0076	629434	4273265	42341	Eagle Springs 1-36	Shut-In	Yes		27-023-05076	9/29/1964	Prod	Kirkwood Oil & Gas	ESP	9/29/1966
0077	628368	4273165	42341	Eagle Springs 84-35	In Use	Yes		27-023-05016	11/6/1964	Inj	Kirkwood Oil & Gas	ESP	11/6/1966
0078	664930	4294020	62839	Gov't 1	Plugged	No		27-033-05078	12/7/1964	Prod	Empire State Oil Company	EXP	12/7/1966
0079	683960	4277800	64769	Federal 1	Plugged	No		27-017-05000	3/21/1965	Prod	Willard Pease Drilling	EXP	3/21/1967
0080	629532	4272859	42341	Eagle Springs 2-36	Shut-In	Yes		27-023-05077	5/10/1965	Prod	Kirkwood Oil & Gas	ESP	5/10/1967
0081	629531	4272860	42341	Pennington 7	Plugged	No		27-023-05080	5/28/1965	Prod	Western Oil Lands	EXP	5/28/1967
0082	629940	4273690	64997	Pennington 3	Plugged	No		27-023-05078	6/9/1965	Prod	Western Oil Lands	EXP	6/9/1967
0083	629234	4273259	42341	Eagle Springs 43-36	Shut-In	Yes		27-023-05017	7/2/1965	Prod	Kirkwood Oil & Gas	ESP	7/2/1967
0084	631890	4289070		WC 1	Plugged	No		27-023-05019	8/3/1965	WW	WC Company	EXP	8/3/1967
0085	688780	4344120	65274	Nevada Federal O-1	Plugged	No		27-033-05051	8/9/1965	Prod	Gulf Oil Corporation	EXP	8/9/1967
0086	629532	4272957	42341	Eagle Springs 4-36	Shut-In	Yes		27-023-05086	8/12/1965	Prod	Kirkwood Oil & Gas	ESP	8/12/1967
0087	699910	4011340	19208	Muddy Dome 1	Plugged	No		27-003-05003	8/24/1965	Prod	Rosen Oil	EXP	8/24/1967
0088	629229	4272942	42431	Eagle Springs 45-36	Plugged	No		27-023-05088	9/15/1965	Prod	Eagle Springs Production	EXP	9/15/1967
0089	627226	4273444	54164	Eagle Springs 11-36	Expired	No		27-023-05074	9/15/1965		Texota	EXP	9/15/1967
0090	690000	4375580	65259	Nevada A-1	Plugged	No		27-033-05053	9/16/1965	Prod	Gulf Oil Corporation	EXP	9/16/1967
0091	655220	3991270	57775	Wilson 1X	Plugged	No		27-003-05070	10/27/1965	Prod	Jack F. Grimm	EXP	10/27/1967
0092	687950	4344320	65274	Nevada Federal O-2	Plugged	No		27-033-05050	11/5/1965	Prod	Gulf Oil Corporation	EXP	11/5/1967
0093	665810	4384810	66551	Nevada Federal BS 1	Plugged	No		27-033-05054	12/15/1965	Prod	Gulf Oil Corporation	EXP	12/15/1967
0094	629515	4273595	42341	Eagle Springs 5-36	In Use	Yes		27-023-05075	12/27/1965	Prod	Kirkwood Oil & Gas	ESP	12/27/1967
0095	651310	4192270	66739	Nevada Federal CM 1	Plugged	No		27-017-05002	2/1/1966	Prod	Gulf Oil Corporation	EXP	2/1/1968
0096	629280	4273730	12321	Eagle Springs 41-36	Plugged	No		27-023-05079	2/28/1966	Prod	Texota	EXP	2/28/1968
0097	626979	4272486	12321	Eagle Springs 17-35	Plugged	No		27-023-05073	2/28/1966	Prod	Texota	EXP	2/28/1968
0098	629530	4272160	64997	Pennington Federal 6	Plugged	No		27-023-05098	3/10/1966	Prod	Western Oil Lands	EXP	3/10/1968
0099	606900	4376650	66739	Nevada Federal CG 1	Plugged	No		27-033-05052	3/15/1966	Prod	Gulf Oil Corporation	EXP	3/15/1968
0100	689760	4257380	66565	Cave Valley 1	Plugged	No		27-017-05001	4/25/1966	Prod	Gulf Oil Corporation	EXP	4/25/1968
0101	615640	4241585	62500	Pennington Pan American 1	Plugged	No		27-023-05101	7/27/1966	Prod	Pennington Oil Producers	EXP	7/27/1968
0102	637050	4408630		Long Valley 35-88	Plugged	No		27-033-05059	10/1/1966	Prod	El Paso Natural Gas	EXP	
0103	630710	4275220	12513	Eagle Springs Pennington Texota	Plugged	No		27-023-05103	12/28/1966	Prod	Trans Western Lands	EXP	12/28/1968
0104	643700	4381610	63956	Robber's Roost 28-76	Plugged	No		27-033-05060	4/4/1967	Prod	Harry Riggs	EXP	4/4/1967
0105	603990	4235410	62404	Nyala 1	Plugged	No		27-023-05063	4/21/1967	Prod	Gulf Oil Corporation	EXP	4/21/1969
0106	609630	4251180	62346	Duck Unit 1	Plugged	No		27-023-05061	6/12/1967	Prod	Gulf Oil Corporation	EXP	6/12/1969
0107	626817	4273184	42341	Eagle Springs 1-34	Shut-In	Yes		27-023-05199	6/12/1967	Inj	Kirkwood Oil & Gas	ESP	6/12/1969
0108	613220	4251250	11	Duck Unit 2	Plugged	No		27-023-05062	5/5/1967	Prod	Gulf Oil Corporation	EXP	5/5/1969
0109	604760	4363450	480	Illipah Federal 1	Plugged	No		27-033-05062	6/29/1967	Prod	Tenneco Oil Company	EXP	6/29/1969
0110	687860	4294650	64772	Federal 1	Plugged	No		27-033-05200	7/7/1967	Prod	Dwight M. Ross Jr	EXP	7/7/1969
0111	622184	4251364	63438	Duck Unit 3	Plugged	No		27-023-05200	11/6/1967	Prod	Gulf Oil Corporation	EXP	11/6/1969
0112			62342	Duck Unit 4	Plugged	No		27-023-052001	11/6/1967	Prod	Gulf Oil Corporation	EXP	11/6/1969

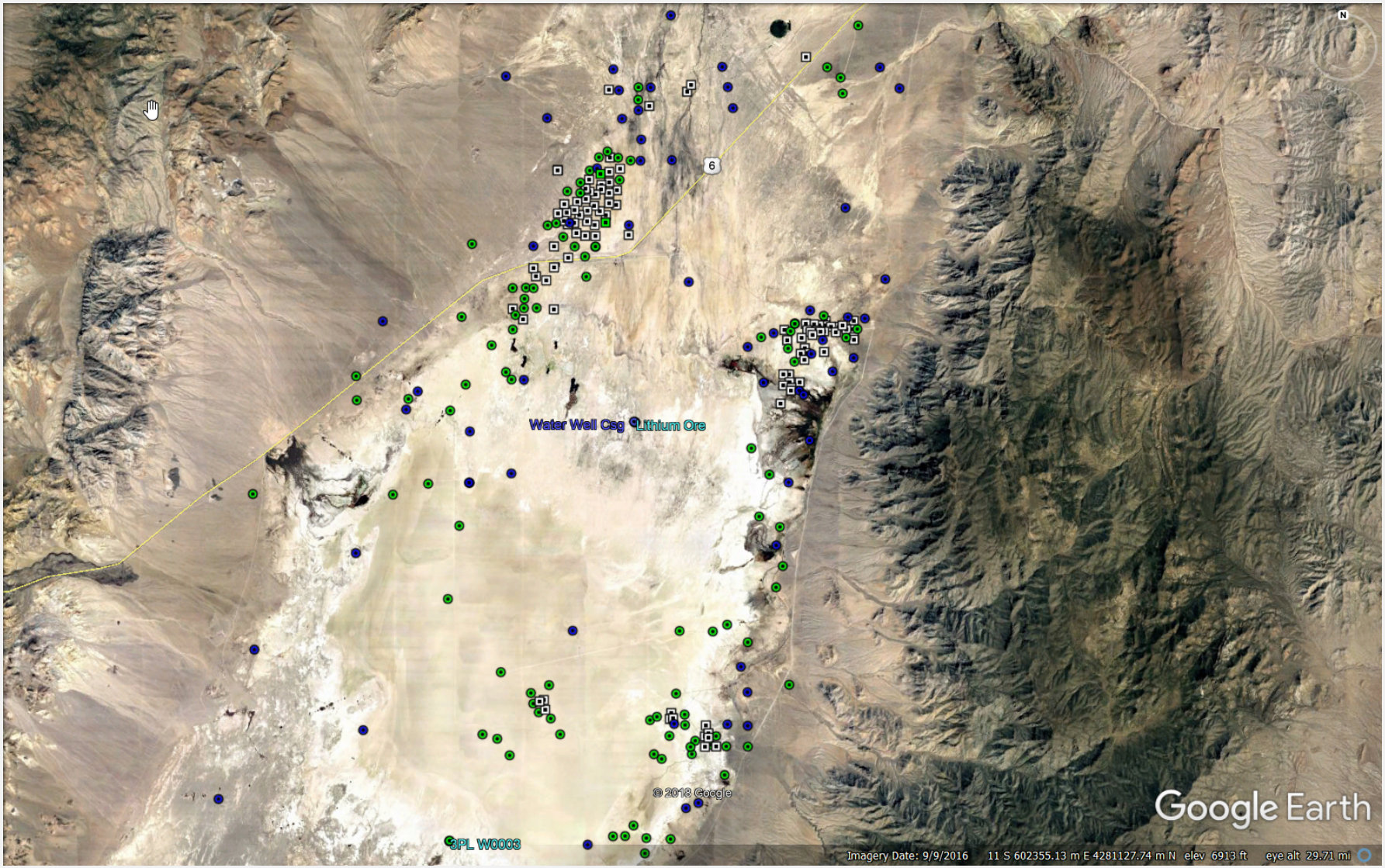
Oil & Gas Database

Total Dept	NAD Ty	Confidential?	BLMFieldOfI	Conventional	Spud Date	Completion Da	Production I	Remarks	F
		No		Yes				Expired	
7045	NAD83	No	BM/TO	Yes	2/14/1964	4/1/1964		Δ from Berry Petroleum	
2805	NAD83	No		Yes	10/15/1963	12/8/1963		GPS reflects 'possible' pad location; no lease # on federal form	
8485	NAD83	No		Yes	4/13/1964	6/4/1964		archives; GPS reflects pad location	
2681	NAD83	No		Yes	4/3/1961	4/28/1961		archives; GPS plotted from permit section line measurements	
3581	NAD83	No		Yes				archives; GPS reflects pad location; GPS plotted from permit section line measurements	
7020	NAD83	No	BM/TO	Yes	12/28/1964	2/15/1965		Δ from Berry Petroleum	
6900	NAD83	No	BM/TO	Yes	12/17/1964	1/29/1965		Δ from Berry Petroleum	
5895	NAD83	No		Yes	12/12/1964	1/22/1965		GPS reflects pad location	
6264	NAD83	No		Yes		5/9/1965		4500 Original Depth; GPS reflects pad location	
6660	NAD83	No	BM/TO	Yes	5/9/1965	7/5/1965		Δ from Berry Petroleum	
5670	NAD83	No		Yes	6/1/1965	7/2/1965		(Steve Goss)	
7195	NAD83	No		Yes	12/10/1967	4/2/1967		6570 Original Depth; spud dates 6/3/65-12/10/67; comp dates 9/6/65-4/2/67; plug dates7/19/65-4/4/67; (Steve Goss); GPS reflects pad	
6752	NAD83	No	BM/TO	Yes	7/5/1965	8/6/1965		Δ from Berry Petroleum	
620	NAD83	No		Yes	8/15/1965	8/19/1965		GPS reflects possible drilling area (location is a guess)	
2690	NAD83	No		Yes	8/15/1965	9/4/1965		GPS reflects pad location	
6381	NAD83	No	BM/TO	Yes	8/11/1965	10/18/1965		Δ from Berry Petroleum	
5666	NAD83	No		Yes	9/17/1965	10/23/1965		GPS reflects pad location	
6903	NAD83	No		Yes	9/28/1965	11/18/1965		archives; GPS reflects pad location	
		No		Yes				Expired	
6100	NAD83	No		Yes	9/21/1965	11/4/1965		GPS reflects pad location	
5686	NAD83	No		Yes	11/4/1965	12/28/1965		abandoned 1965; (Minerals Drilling); GPS reflects possible drilling area (location is a guess)	
3253	NAD83	No		Yes	11/13/1965	11/30/1965		GPS reflects pad location	
2978	NAD83	No		Yes	12/27/1965	1/15/1966		GPS reflects pad location	
7170	NAD83	No	BM/TO	Yes	1/18/1966	4/6/1966		Δ from Berry Petroleum; no scanned permit file	
2434	NAD83	No		Yes	2/3/1966	3/7/1966		GPS reflects pad location	
7566	NAD83	No		Yes	7/14/1966	10/1/1966		archives; GPS reflects pad location	
7500	NAD83	No		Yes	3/3/1966	4/14/1966		archives; GPS reflects pad location	
5198	NAD83	No		Yes	3/18/1966	4/24/1966		archives; (Steve Goss); GPS reflects pad location	
5001	NAD83	No		Yes	3/19/1966	4/14/1966		archives; GPS reflects pad location	
7024	NAD83	No		Yes	6/9/1966	7/6/1966		GPS reflects pad location	
1505	NAD83	No		Yes	7/29/1966	8/8/1966		abandoned 1966	
7084	NAD83	No		Yes				archives?; comp-no info; GPS reflects pad location; no scanned permit file	
4420	NAD83	No		Yes	12/30/1966	3/18/1967		archives; GPS reflects pad location	
6428	NAD83	No		Yes	4/6/1967	6/2/1967		GPS reflects pad location	
7780	NAD83	No		Yes	5/1/1967	6/11/1967		GPS reflects pad location	
6553	NAD83	No		Yes	7/28/1967	8/8/1967		GPS reflects pad location; Google Earth shows pad in SWSW	
8694	NAD83	No	BM/TO	Yes	12/7/1967	12/18/1967		spud dates 6/15/67-12/7/67; comp dates8/23/67-12/18/67; from Berry Petroleum; original lease #12318B	
6553	NAD83	No		Yes	6/21/1967	7/21/1967		GPS reflects pad location; Google Earth shows pad in SESW	
7620	NAD83	No		Yes	7/5/1967	8/31/1967		GPS reflects pad location	
5016	NAD83	No		Yes	6/25/1967	8/3/1967		GPS reflects 'possible' pad location	
7000	NAD83	No		Yes	11/4/1967	11/17/1967		Obtained GPS in field	
3138		No		Yes	11/4/1967	11/17/1967		Not seen on Google Earth	

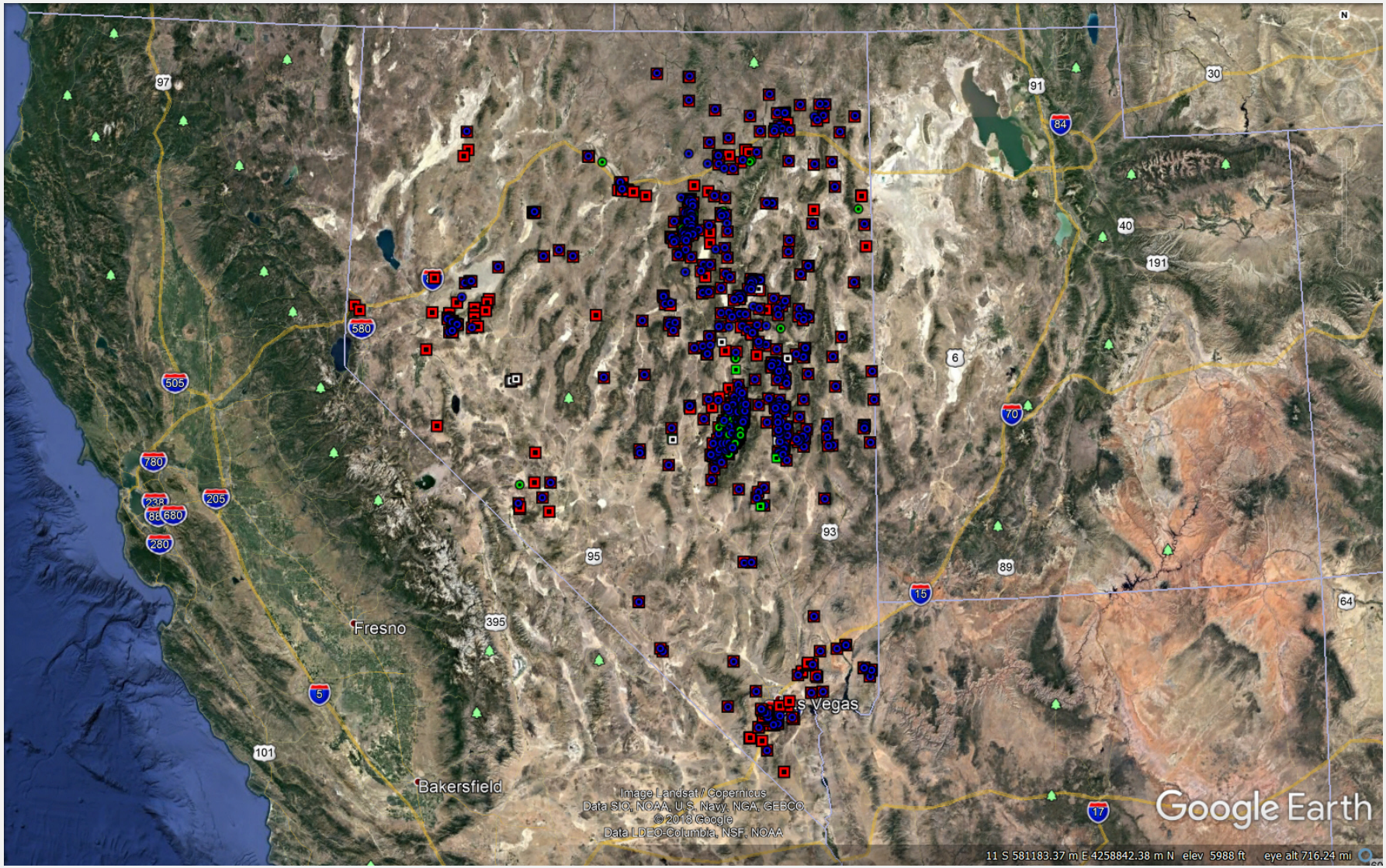
All Wells Plotted On Google Earth



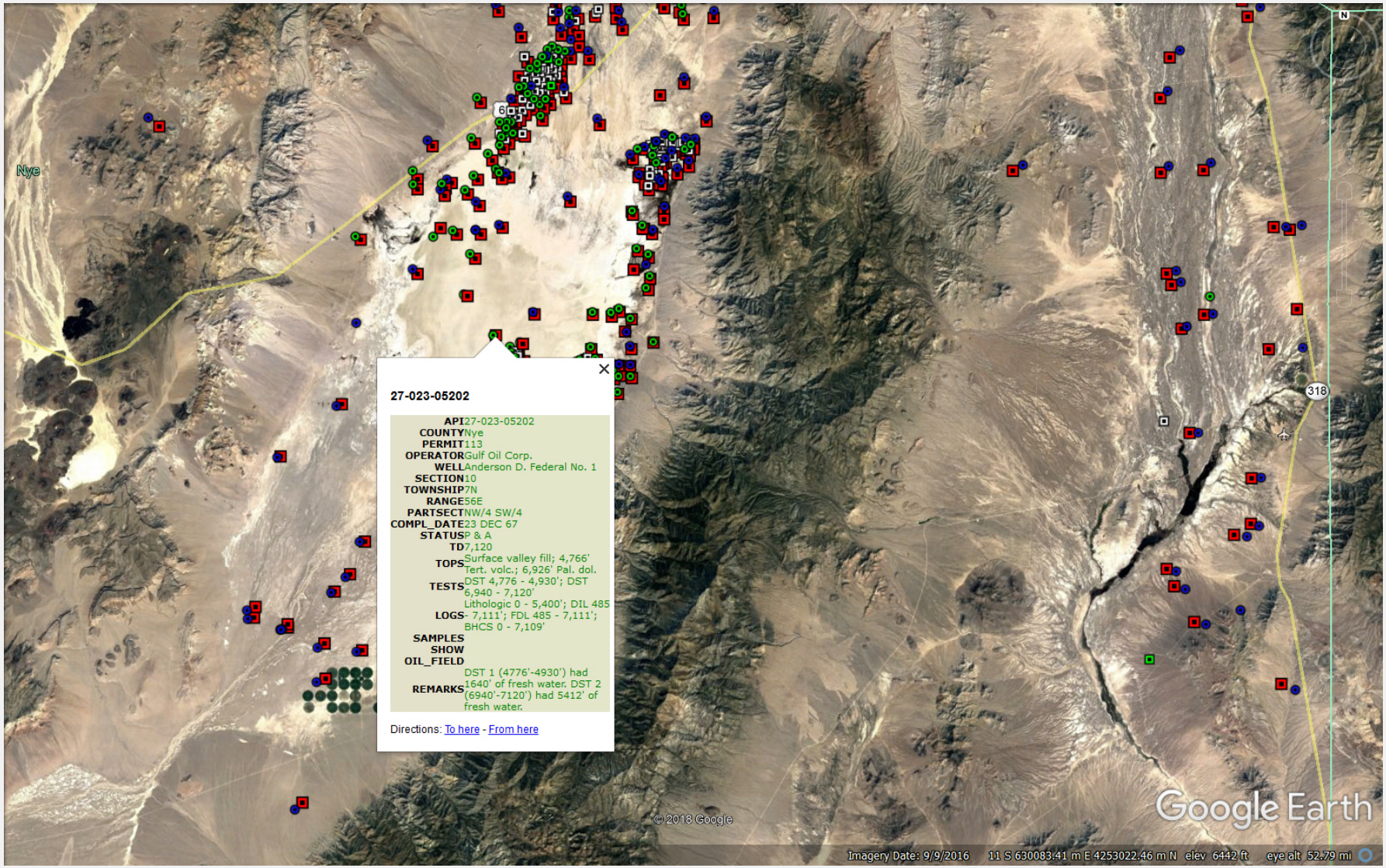
Wells Plotted On Google Earth



Wells Plotted - Ron Hess 2007



Wells Plotted - Ron Hess 2007

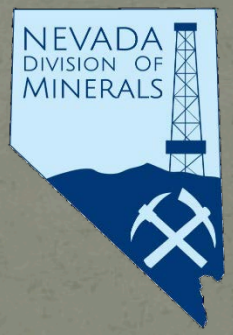


II. C Nevada Land Withdrawals from Mineral Entry-A Historical Perspective

Nevada Land Withdrawals from Mineral Entry
A Historical Perspective

May, 2018 update

University of Nevada, Reno



Modified from original study in 2011 by:
S. Bassett, I. Morrison, and K. Berry
Department of Geography
Mackay School of Earth Sciences and Engineering,
College of Science
University of Nevada, Reno

Updated in May, 2018 by:

Garrett A. Wake
Nevada Division of Minerals
gwake@minerals.nv.gov
Minerals.nv.gov

Disclaimer:

The Nevada Division of Minerals (NDOM hereafter) assumes no responsibility for errors or omissions. No warranty is made by NDOM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data; nor shall the act of distribution to contractors, partners, or beyond, constitute any such warranty for individual or aggregate data use with other data. In no event shall NDOM have any liability whatsoever for payment of any consequential, incidental, indirect, special, or tort damages of any kind, including, but not limited to, any loss of profits arising out of the use or reliance on this data.

"Unbelievable as it may seem, an area larger than that encompassing 25 of the 27 states east of the Mississippi River is no longer accessible even for mineral exploration, not to mention development for mining"

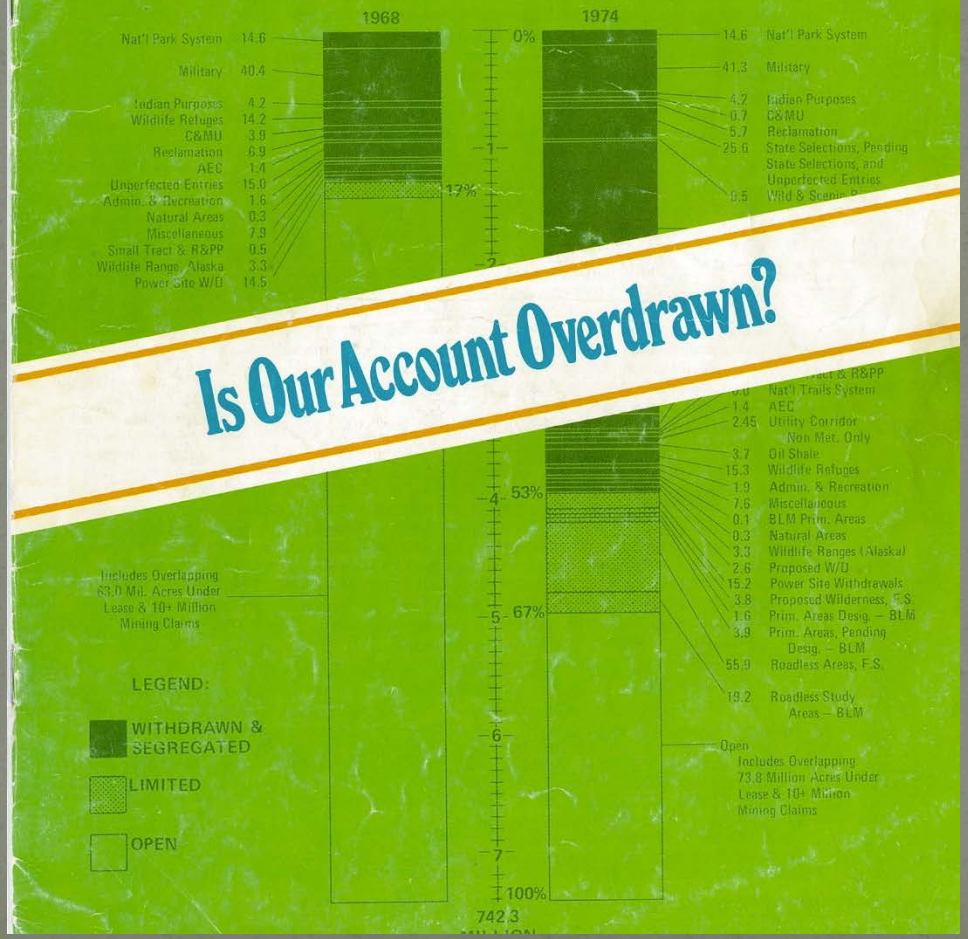
J. Allen Overton. Jr.
President
American Mining Congress

1975

MINING CONGRESS JOURNAL
PUBLISHED BY THE AMERICAN MINING CONGRESS

Is Our Account Overdrawn?

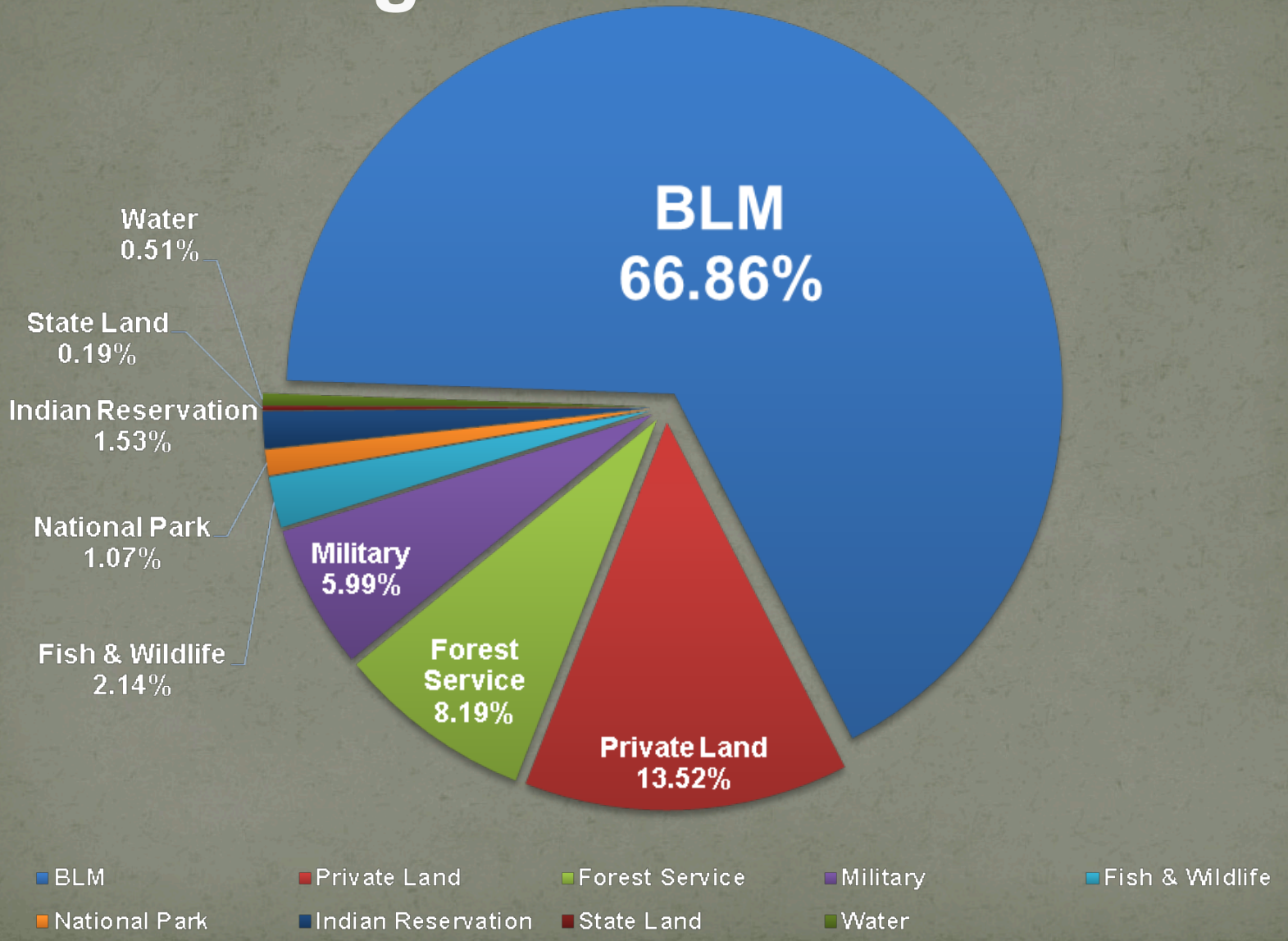
PUBLIC LANDS EXCLUDED FROM MINERAL EXPLORATION AND DEVELOPMENT UNDER THE MINING LAW



NEVADA Statistics

- Became Territory of the United States in 1848 as part of the Treaty with Mexico following the Mexican-American War
- Part of Utah Territory originally then became Nevada Territory in 1860
- Established as the 36th state of the Union October 31, 1864 – Population @ 50,000
- Total Area: 70,264,320 acres, 7th largest state

Who Manages/Owns Nevada Lands?



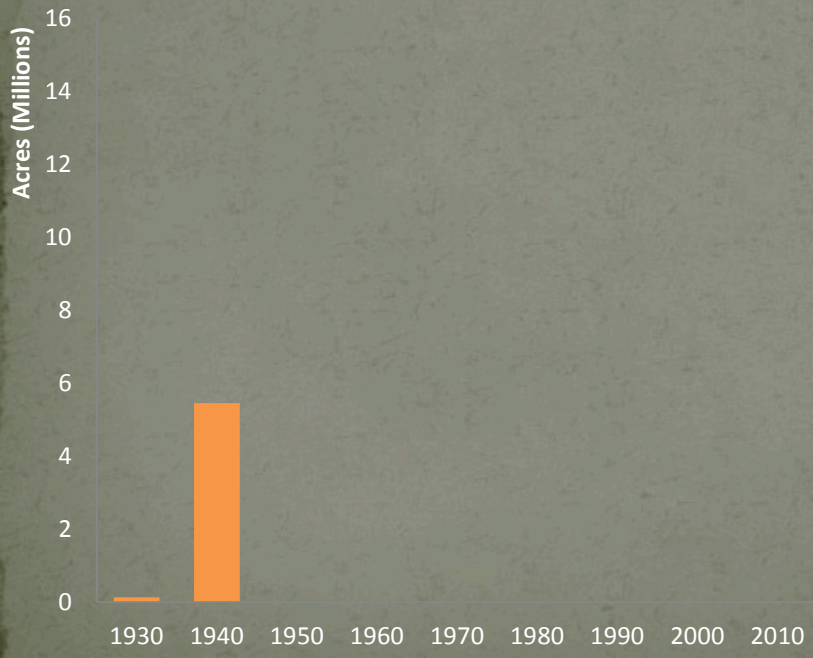
Data from BLM Public Land Statistics Publication, Vol. 201, May, 2017 (BLM/OC/ST-17/001+1165; P-108-6)

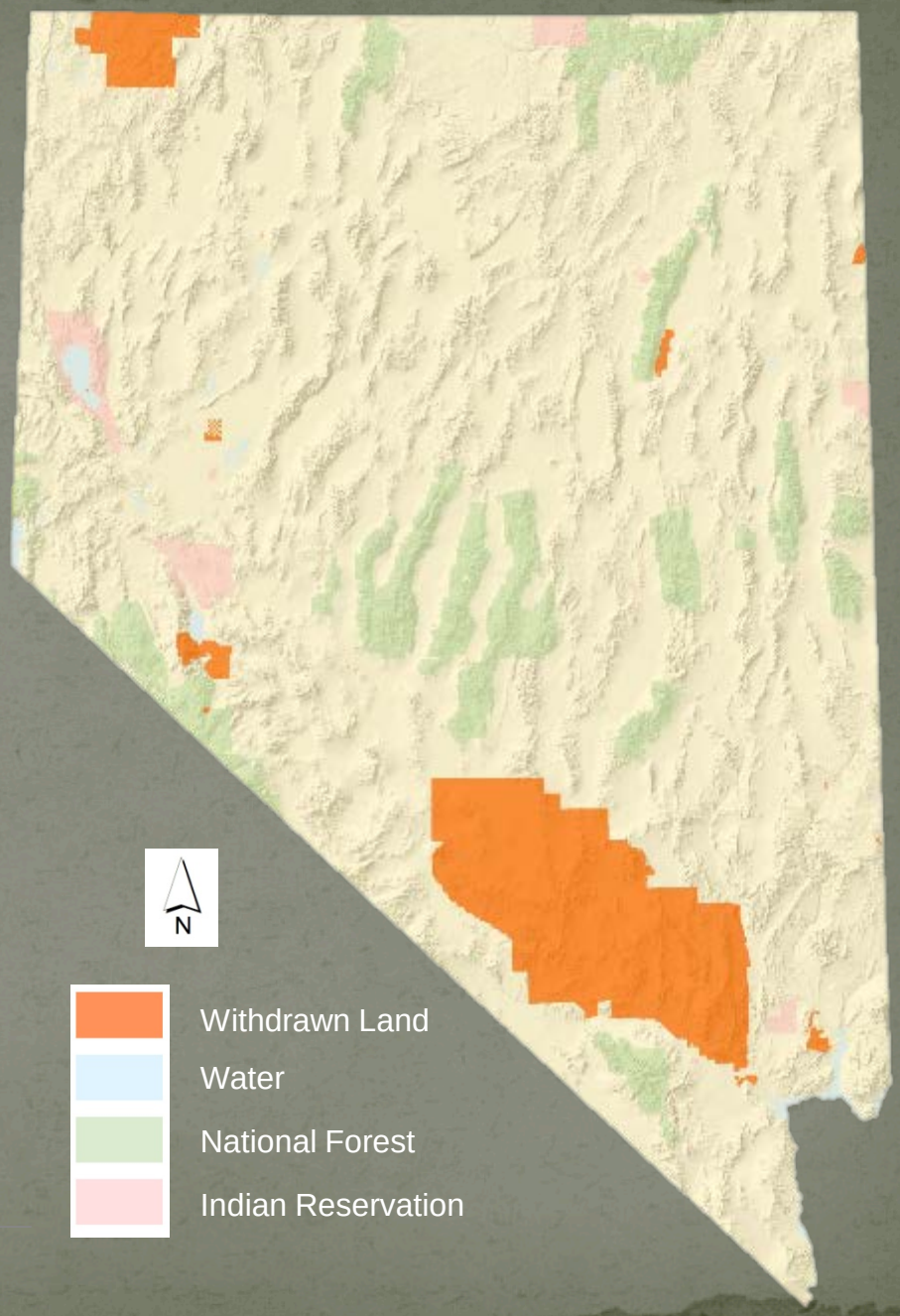
Who Manages/Owns Nevada Lands?

Land Status	Acres	% of Nevada
BLM	46,977,225	66.86%
Private Land	9,497,542	13.52%
Forest Service	5,756,387	8.19%
Military	4,212,128	5.99%
Fish & Wildlife Service	1,503,388	2.14%
National Park Service	750,709	1.07%
Bur. of Indian Affairs	1,076,574	1.53%
State Land	132,334	0.19%
Water	358,033	0.51%

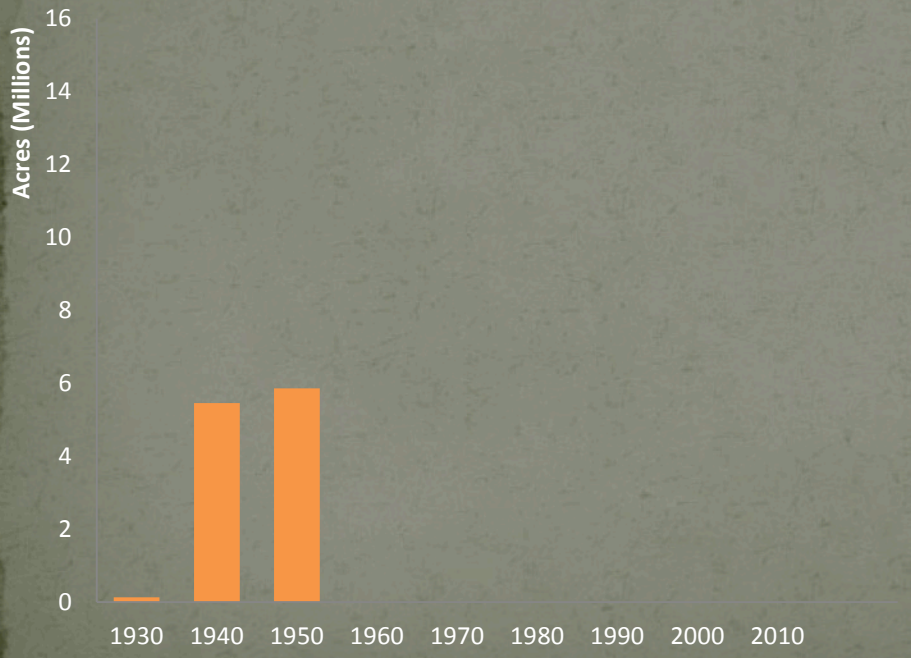
Nevada Land Withdrawals to 1930

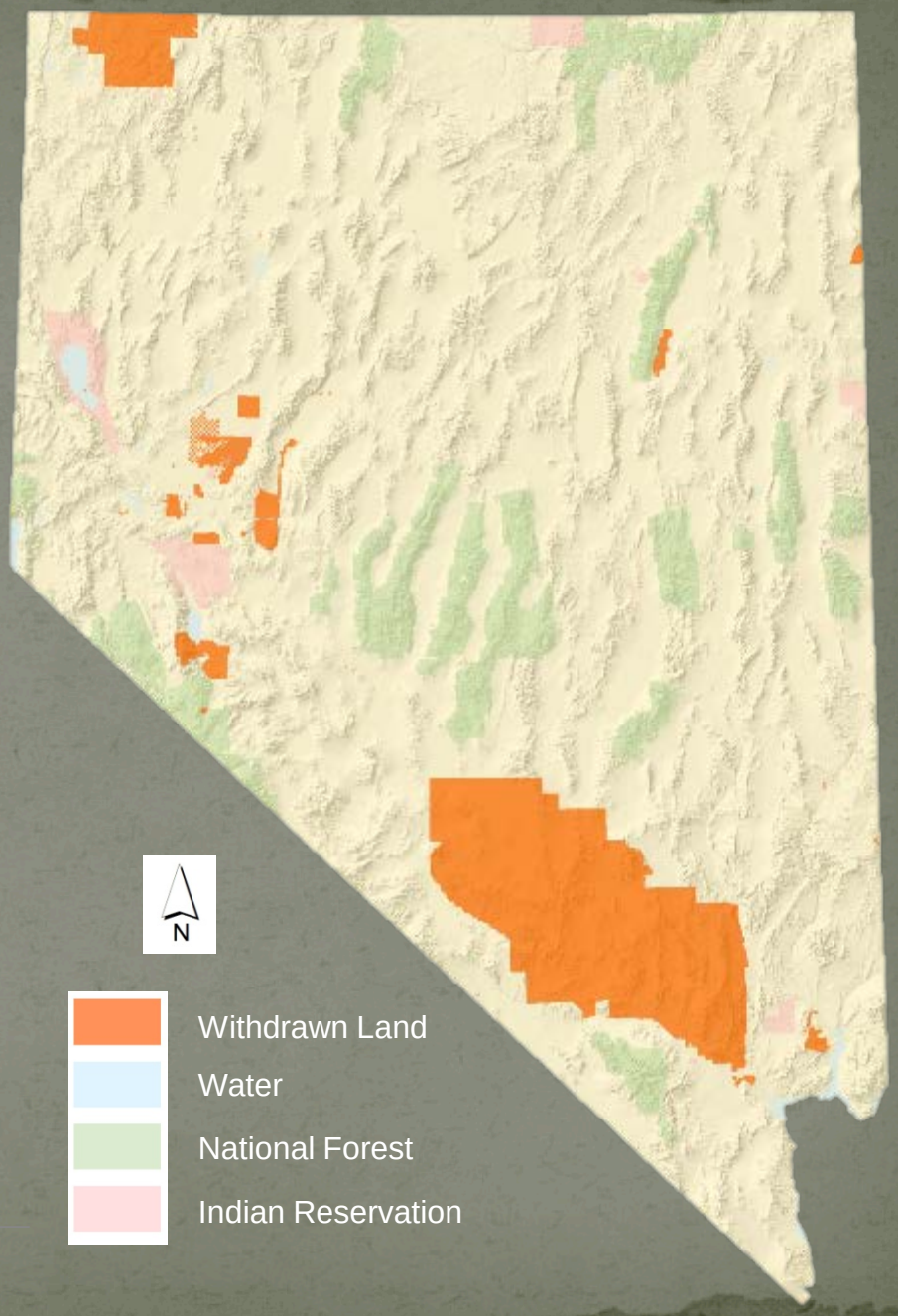
Nevada Land Withdrawals to 1940



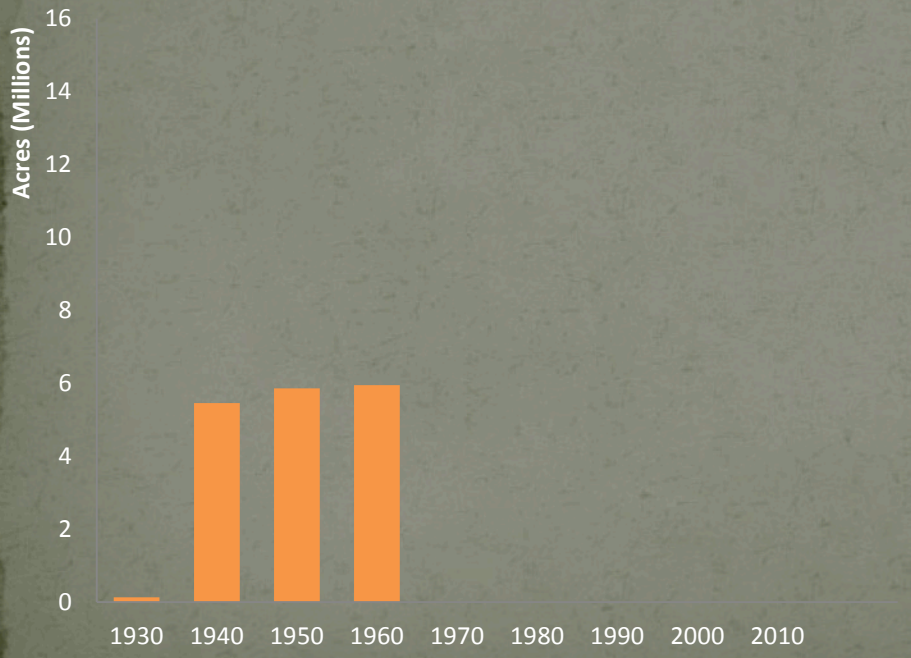


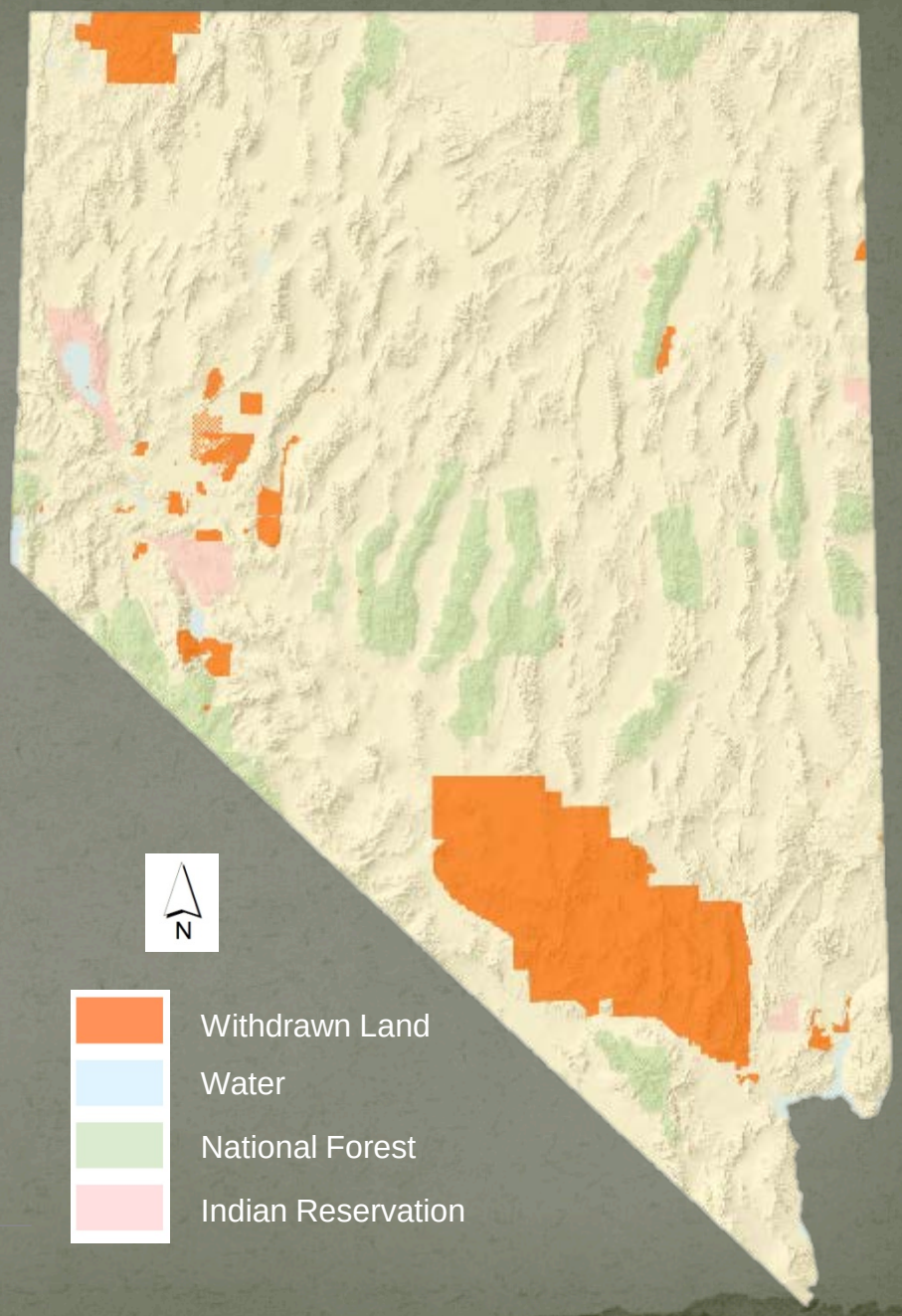
Nevada Land Withdrawals to 1950



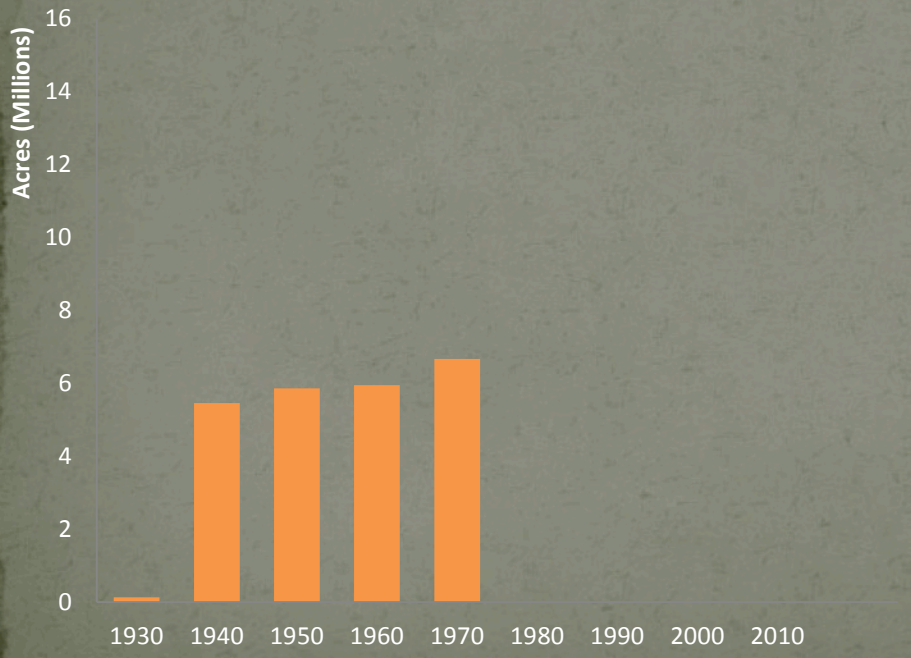


Nevada Land Withdrawals to 1960

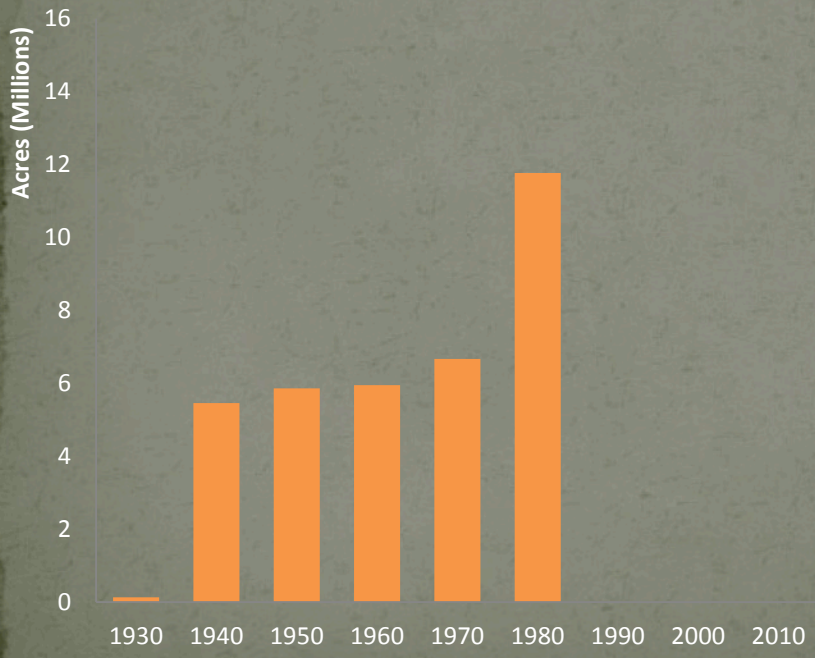


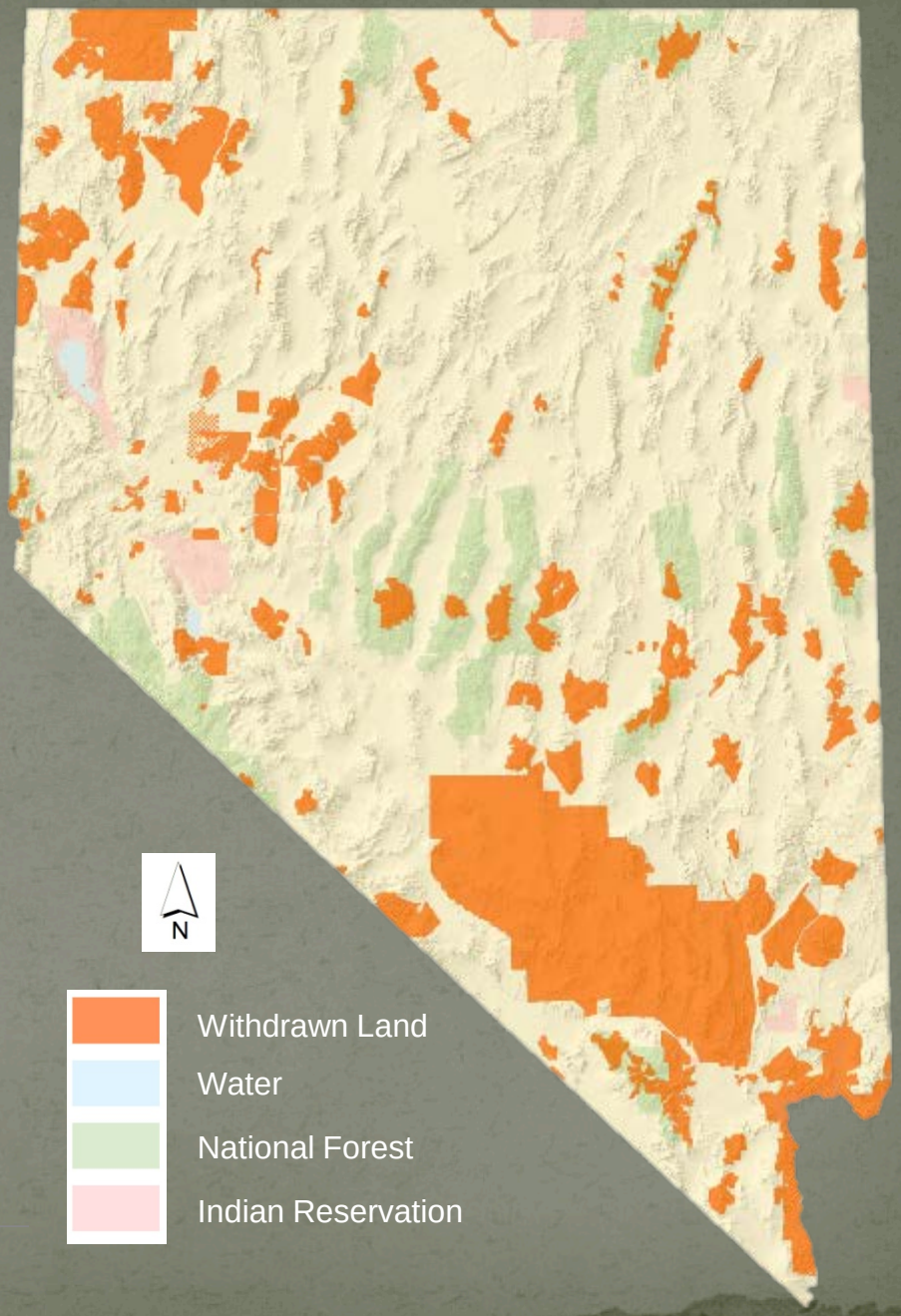


Nevada Land Withdrawals to 1970



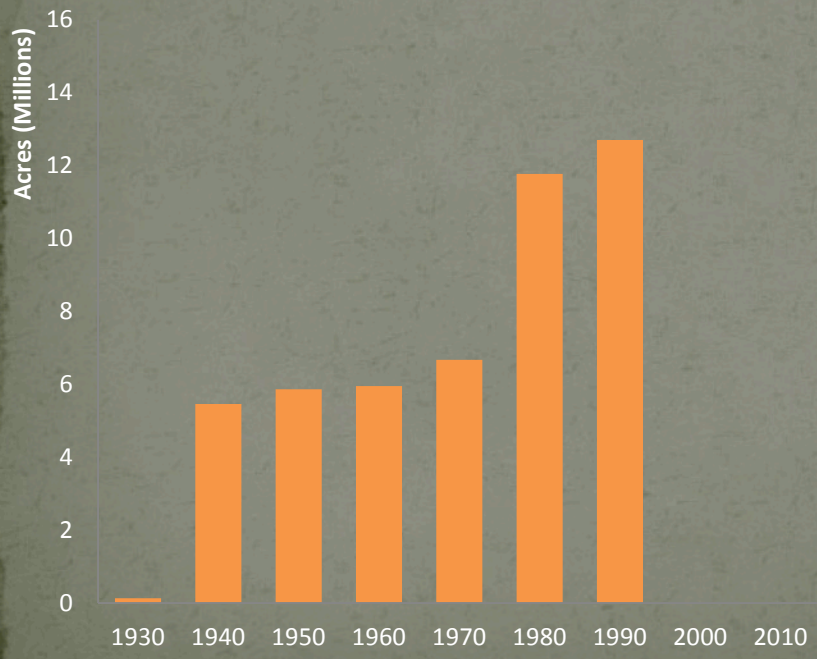
Nevada Land Withdrawals to 1980

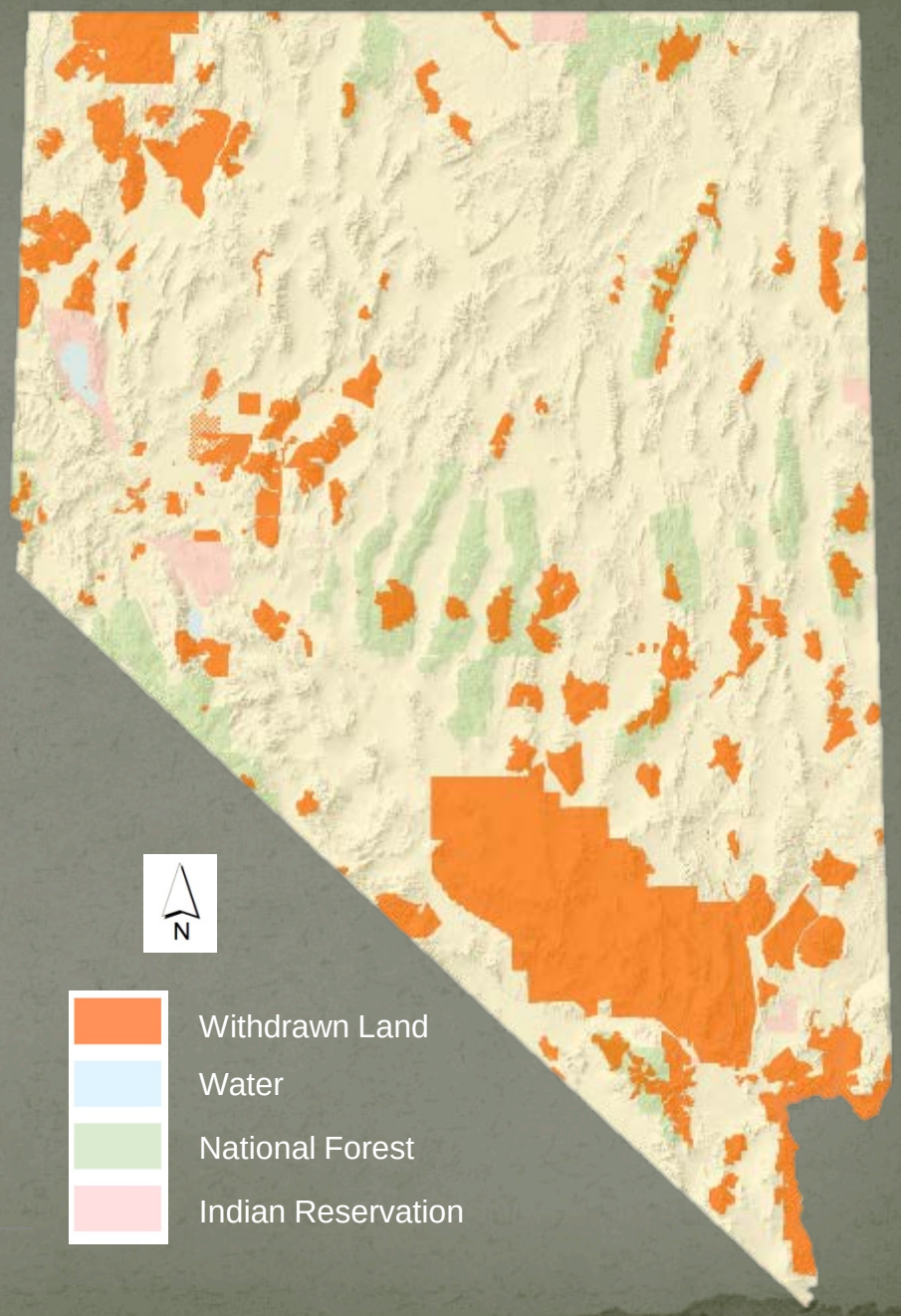




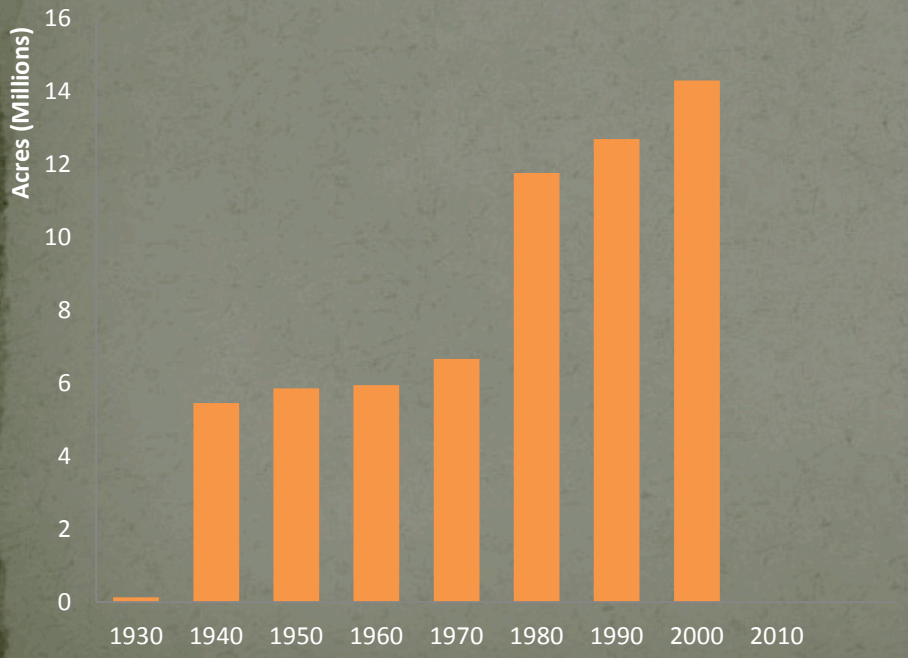
*Map depicting to 1990

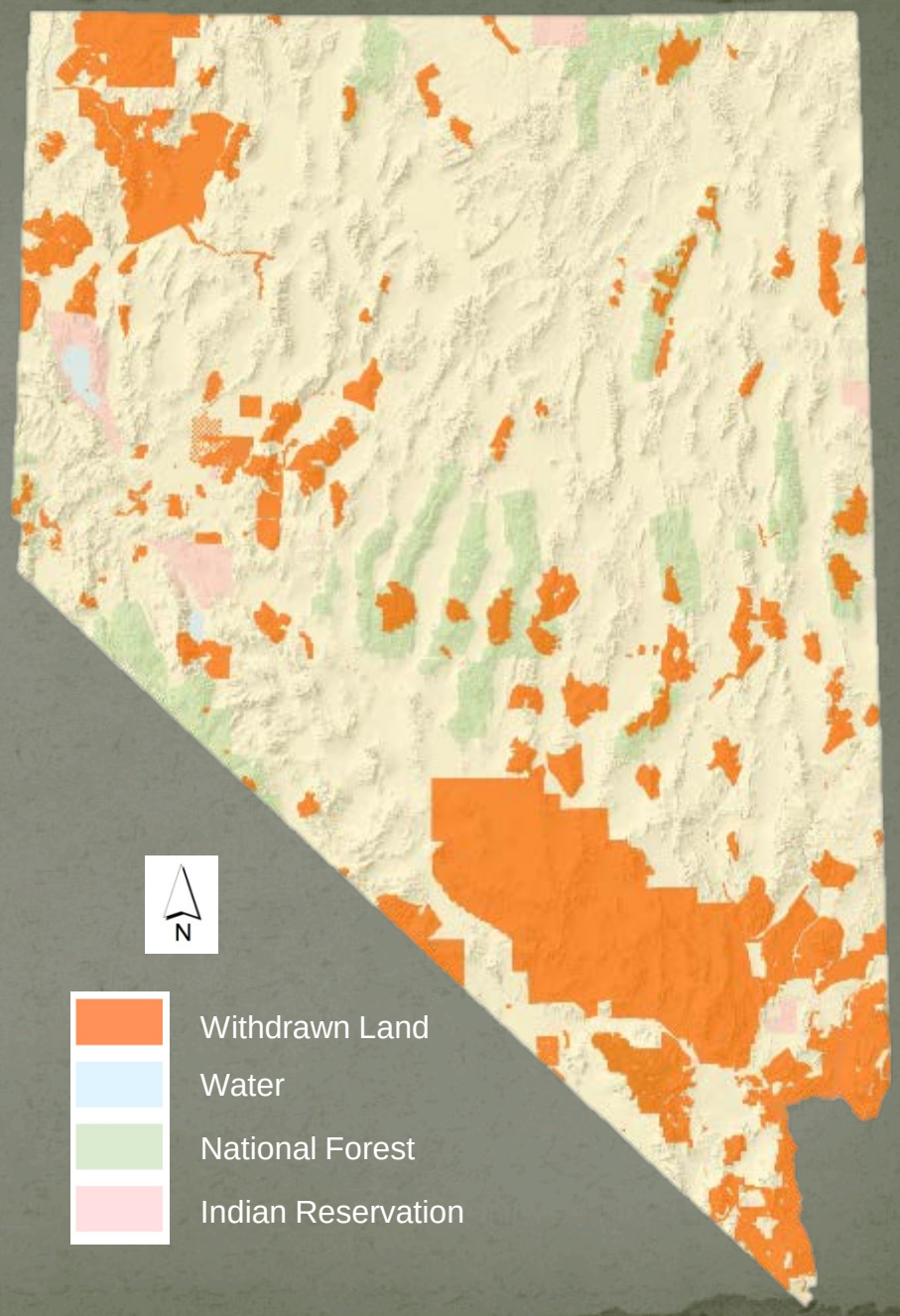
Nevada Land Withdrawals to 1990



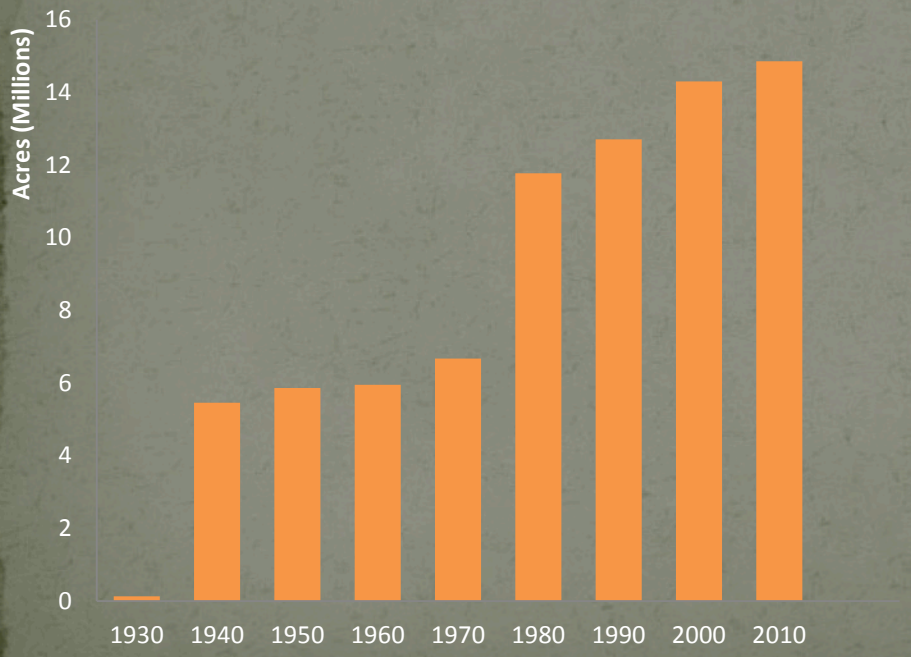


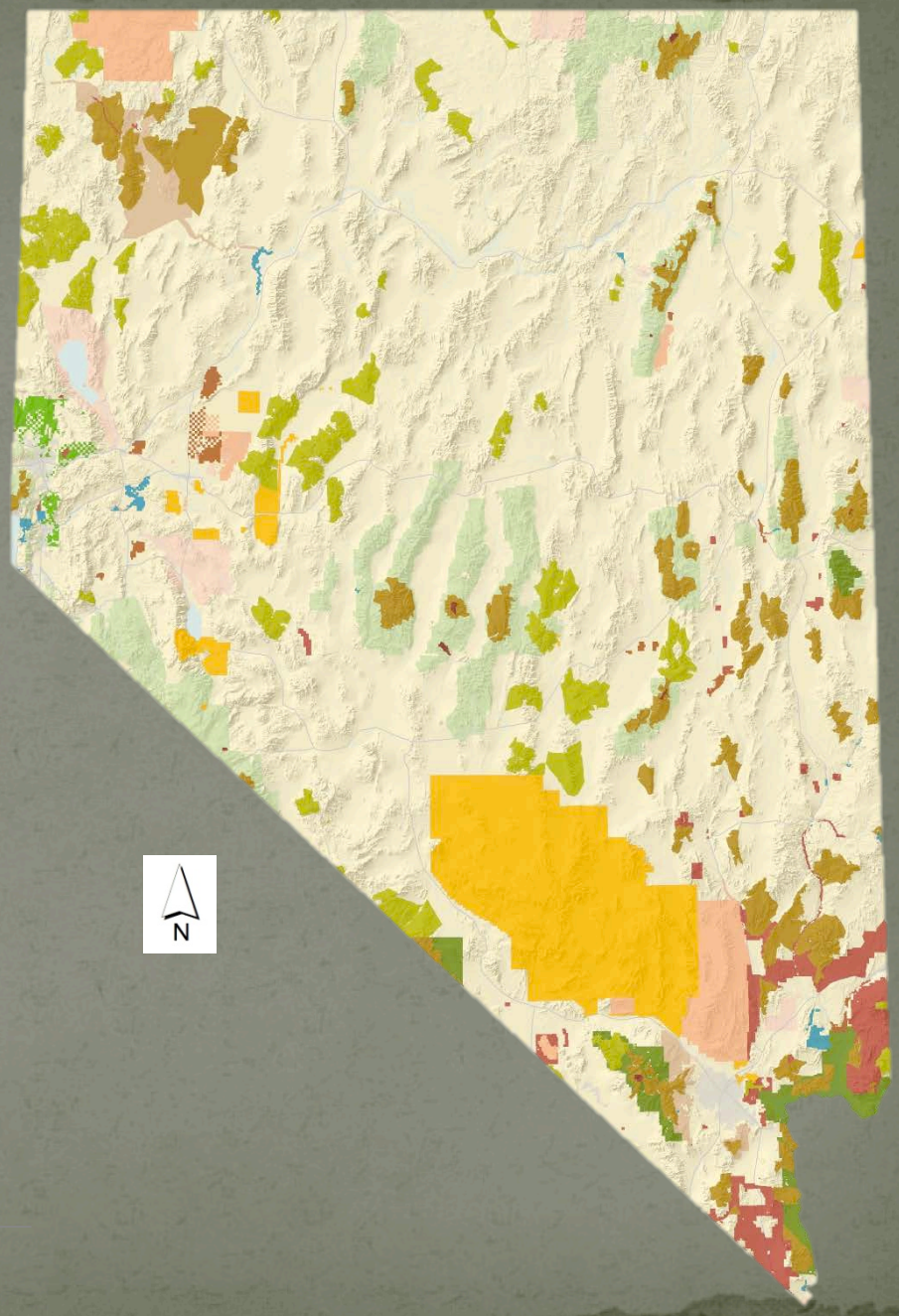
Nevada Land Withdrawals to 2000





Nevada Land Withdrawals through 2010





Nevada Land Withdrawal Status through 2010

Withdrawn Lands

- Areas of Critical Environmental Concern (ACEC)
- Fish & Wildlife Areas
- Military Areas
- National Conservation Areas
- National Parks & Recreation Areas
- Research Natural Areas
- Nevada State Parks
- Urban Interface Withdrawals
- Wilderness Areas
- Instant and Wilderness Study Areas
- Wildlife Management Areas

Non-Withdrawn Lands

- Major Highways
- Urban Areas
- National Forest
- Water Bodies
- Indian Reservations

Total Land Area Withdrawn through 2010

Year	Acres	% of Nevada
>1930	132,247	0.19%
-1940	5,460,598	7.77%
-1950	5,861,114	8.34%
-1960	5,951,860	8.47%
-1970	6,672,218	9.50%
-1980	11,767,565	16.75%
-1990	12,701,336	18.08%
-2000	14,299,822	20.35%
-2010	14,848,842	21.13%

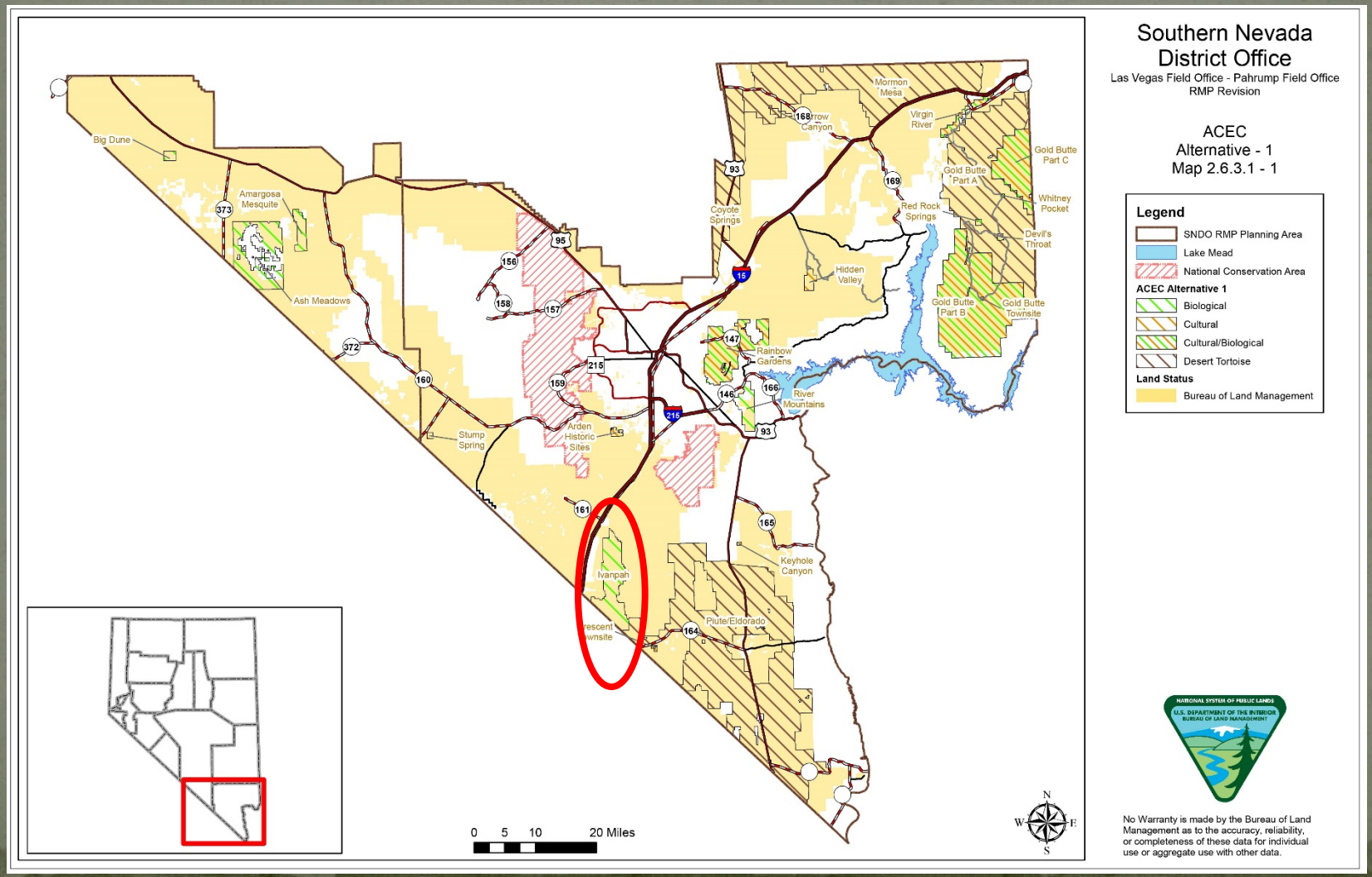
← Wilderness Act

← FLPMA

← Wilderness Designations

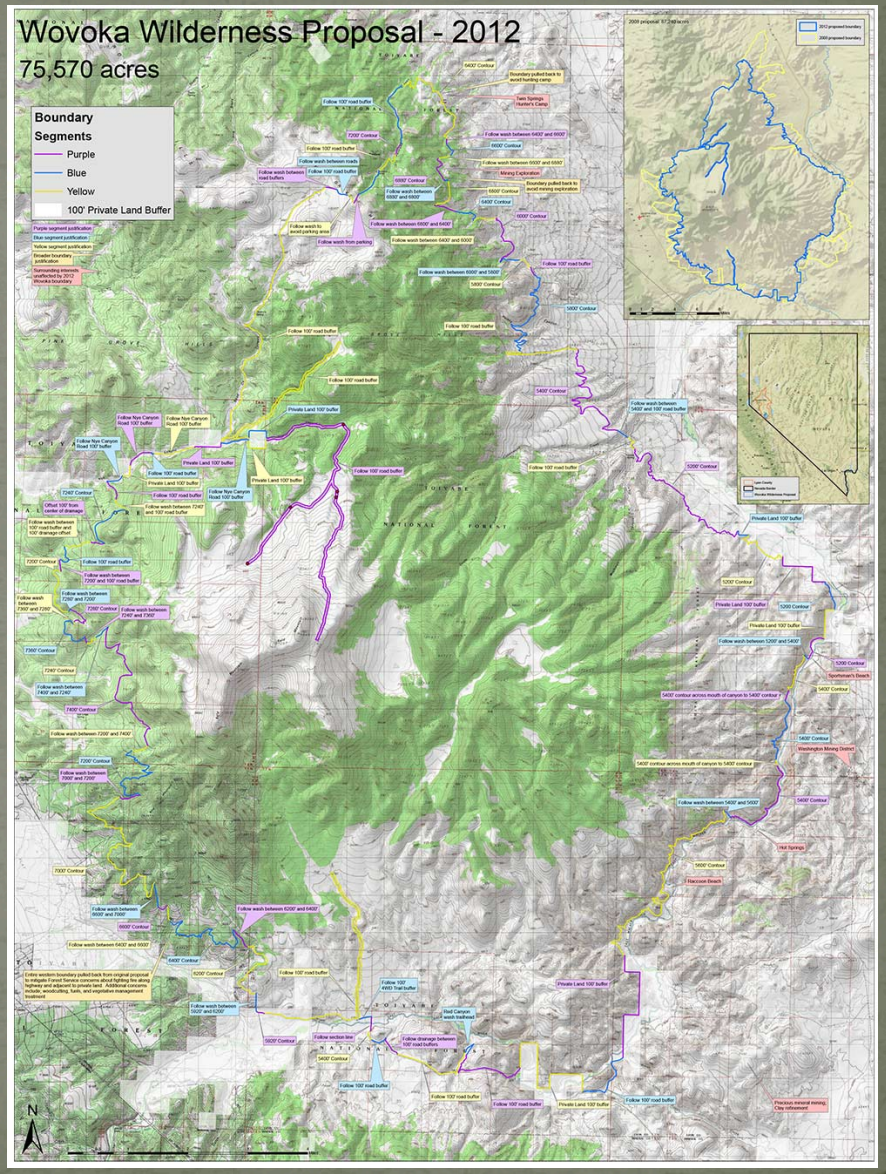
Recent Withdrawals: Jan, 2011 through May, 2018

- Ivanpah ACEC (Silver State South ROD; 2013)
  - 31,857 acres Case File: NVN 085801



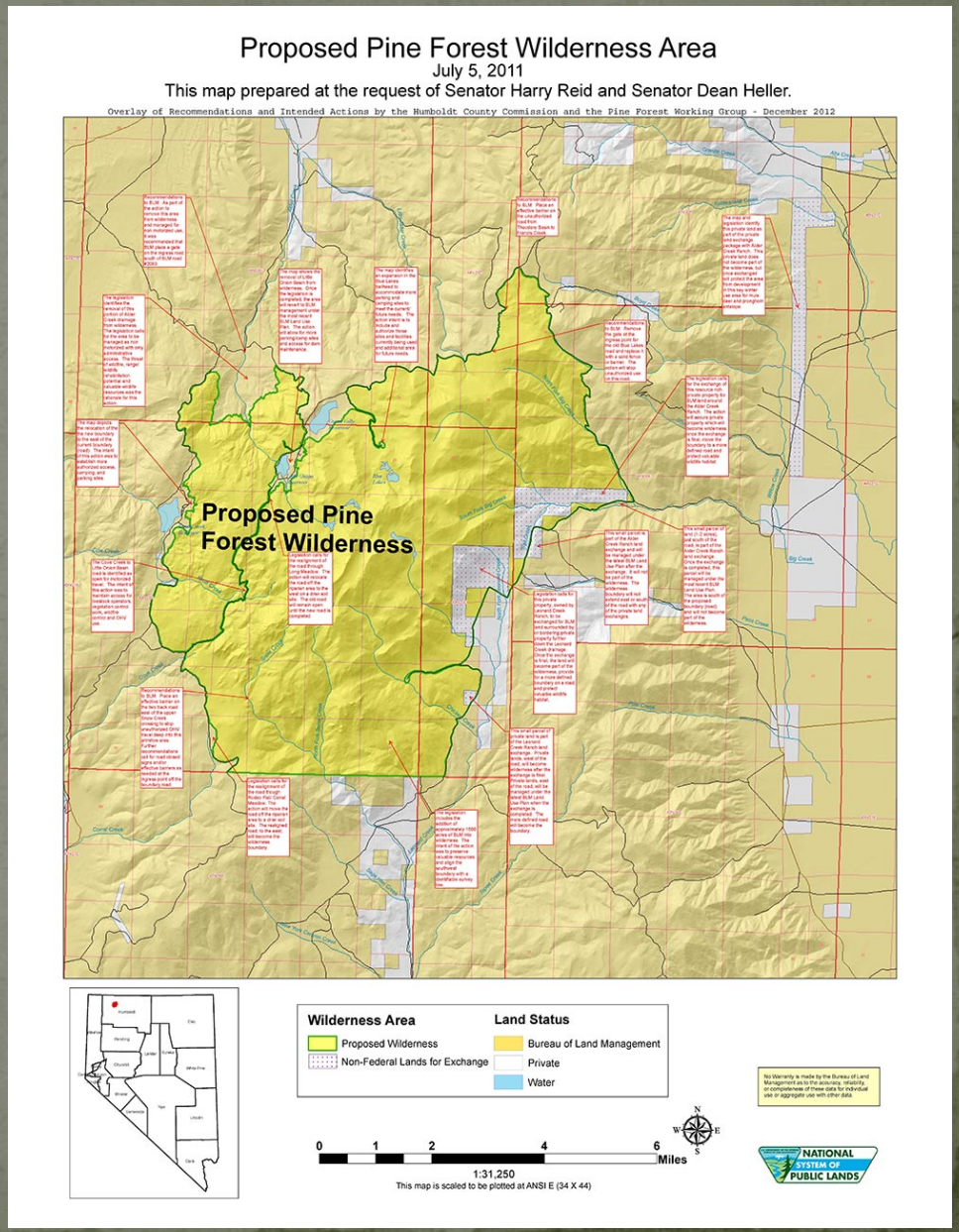
Recent Withdrawals: Jan, 2011 through May, 2018

- Wovoka Wilderness (USFS; 2014):
  - 48,981 acres



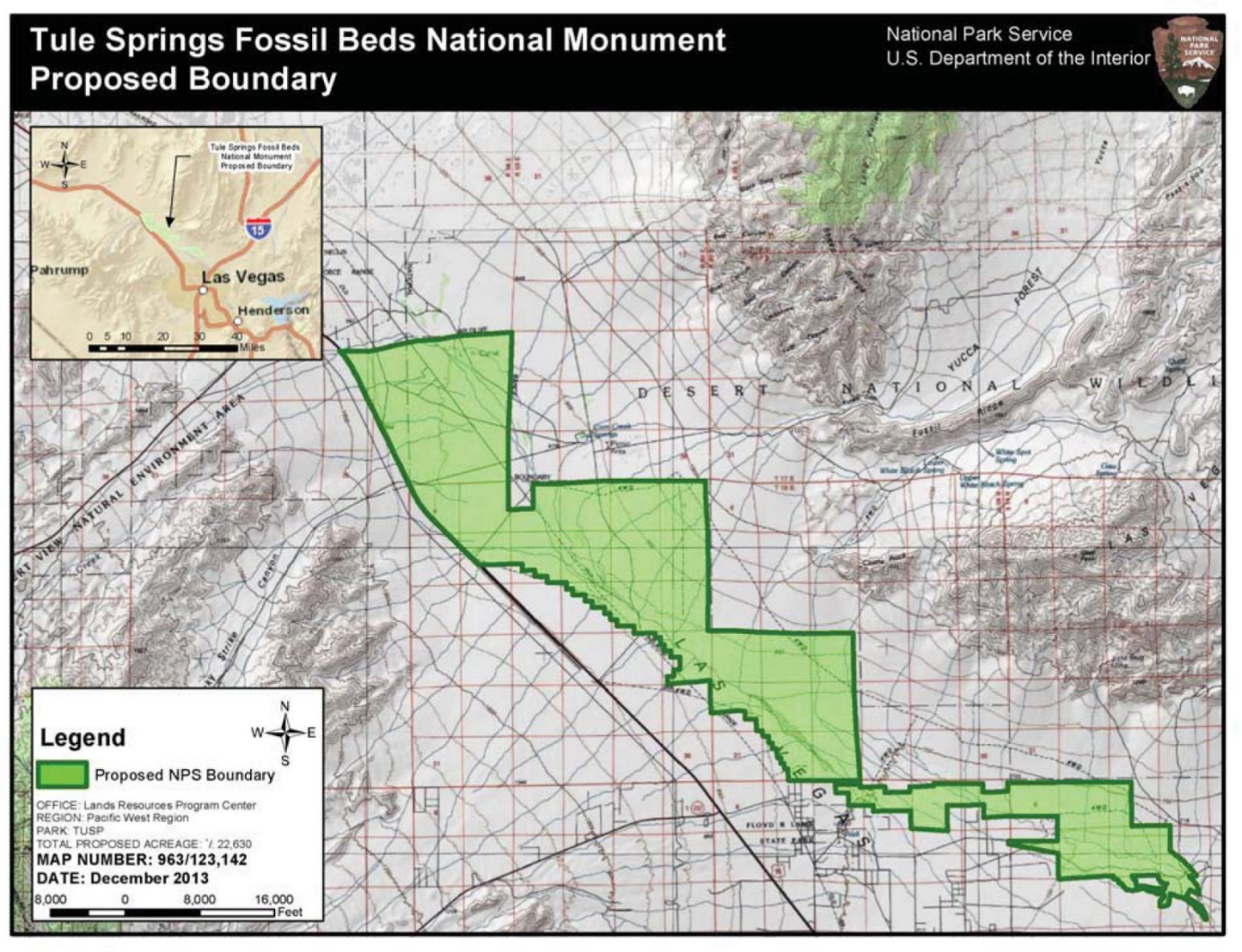
Recent Withdrawals: Jan, 2011 through May, 2018

- Pine Forest Range Wilderness (BLM; 2014):
  - 24,015 acres
    - Release of 25,650 acres from Blue Lakes and Alder Creek WSA
    - Net 1,635 Acres released in WSA to Wilderness conversion



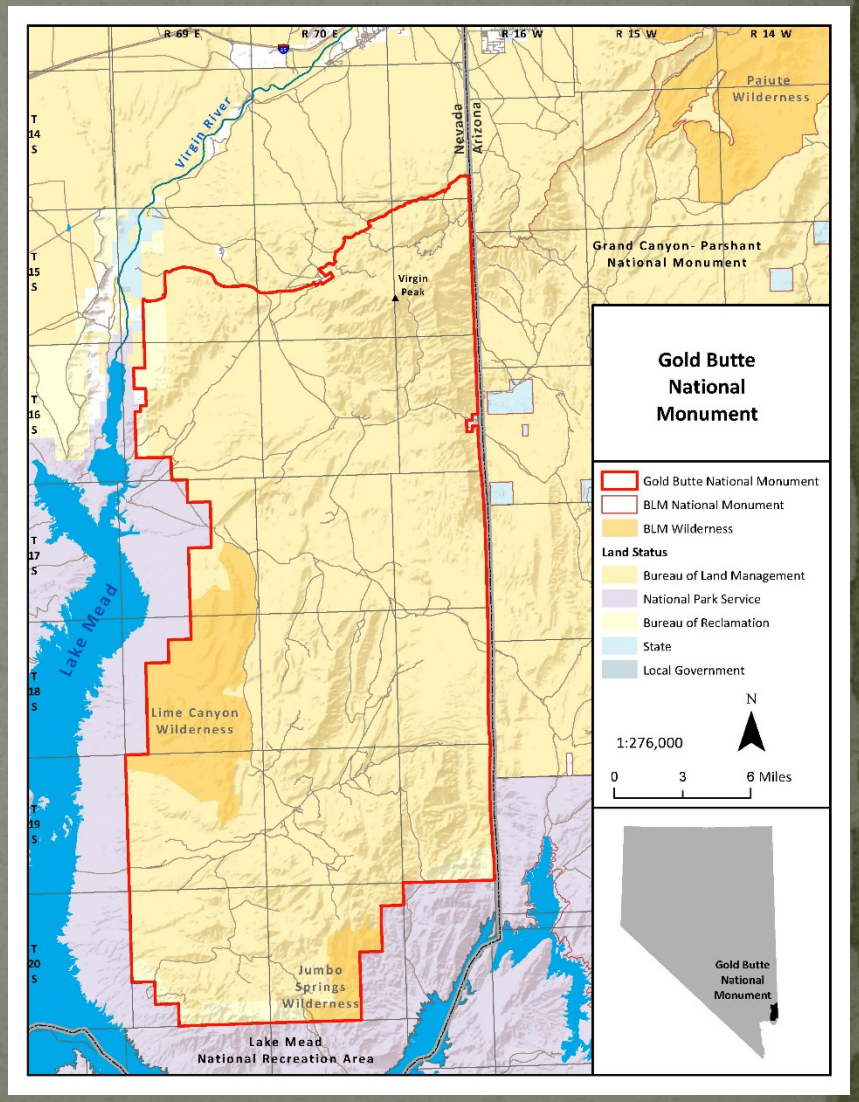
Recent Withdrawals: Jan, 2011 through May, 2018

- Tule Springs National Monument (2014)
  - 22,650 acres



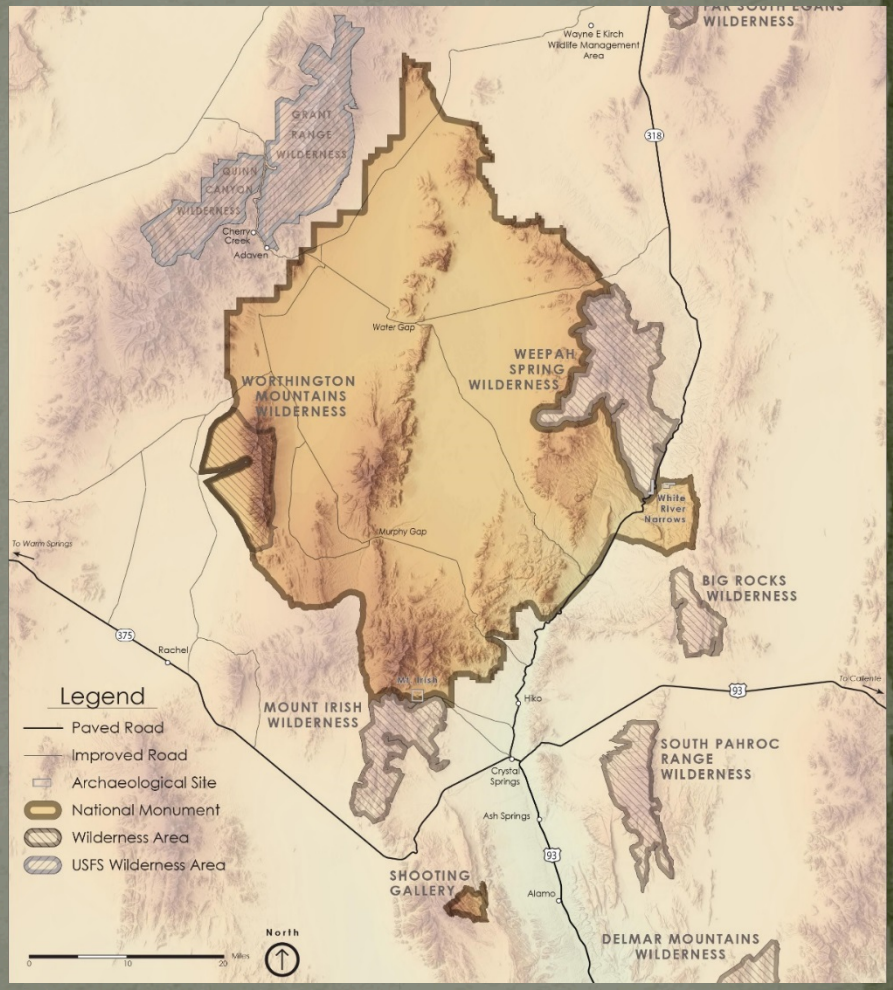
Recent Withdrawals: Jan, 2011 through May, 2018

- Gold Butte National Monument (2016)
  - 296,941 acres
    - 293,539 acres already within ACEC
    - Net 3,402 additional acres withdrawn outside of original ACEC
    - Remaining portions of Gold Butte/Virgin River ACECs still in place



Recent Withdrawals: Jan, 2011 through May, 2018

- Basin & Range National Monument (2015)
  - 704,000 acres
    - 15,075 acres already within Mt. Irish ACEC
    - 30,623 acres already within Worthington Mountains Wilderness
    - Net 658,302 acres withdrawn outside of preexisting withdrawals



Recent Withdrawals: Jan, 2011 through May, 2018

Recent Locatable Mineral Withdrawals Summary

- National Monuments:
  - Tule Springs Fossil Beds (2014): 22,650 acres
  - Basin and Range (2015): 704,000 acres
    - 15,075 acres already within ACEC area (Mt. Irish ACEC)
    - 30,623 acres already within Wilderness (Worthington Mountains Wilderness)
    - Net 658,302 additional acres withdrawn
  - Gold Butte National Monument (2016): 296,941 acres
    - 293,539 acres already within ACEC (multiple)
    - Net 3,402 additional acres withdrawn
- BLM & USFS Wilderness Areas:
  - Pine Forest Range Wilderness (BLM; 2014): 24,015 acres
    - 25,650 acres released from WSA
    - Net release of 1,635 acres
  - Wovoka Wilderness (USFS; 2014): 48,981 acres
- Areas of Critical Environmental Concern
  - Ivanpah (Silver State South ROD; 2014): 31,857 acres

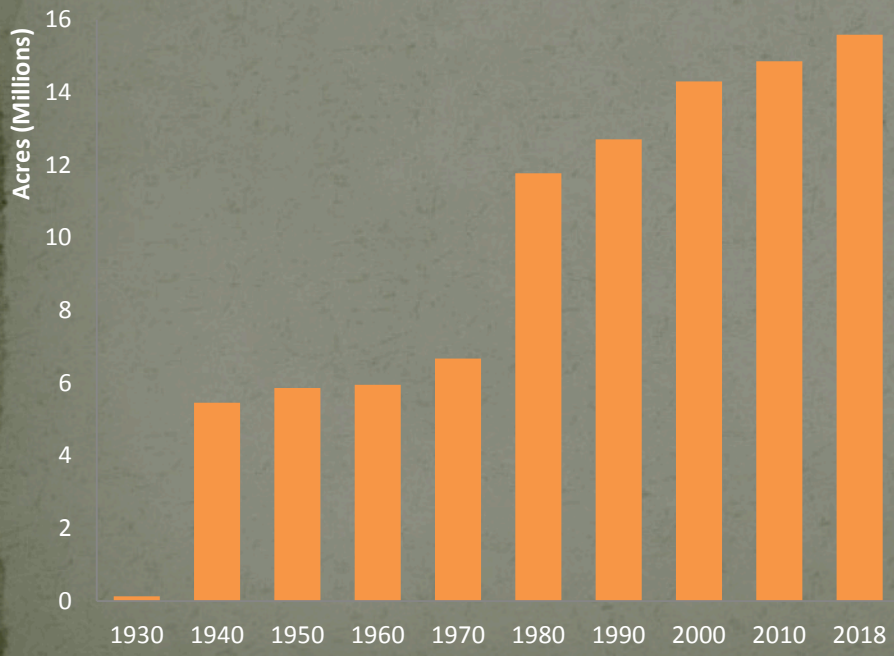
*Notable withdrawals listed; this list is not exhaustive

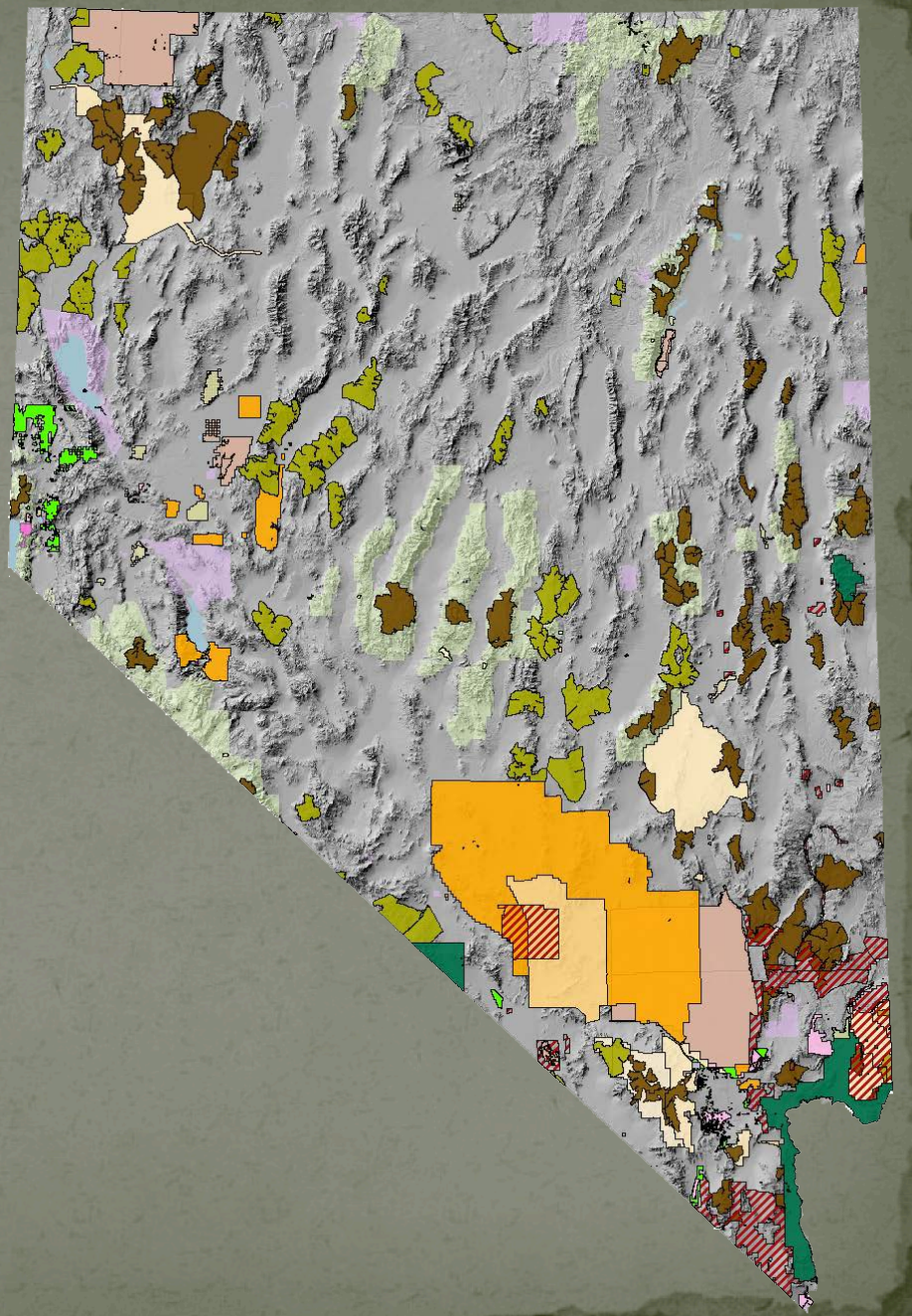
Total Land Area Withdrawn through May, 2018

(not inclusive of proposed withdrawals)

Year	Acres	% of Nevada	
>1930	132,247	0.19%	
-1940	5,460,598	7.77%	
-1950	5,861,114	8.34%	
-1960	5,951,860	8.47%	← Wilderness
-1970	6,672,218	9.50%	← FLPMA
-1980	11,767,565	16.75%	← Wilderness Study Areas
-1990	12,701,336	18.08%	
-2000	14,299,822	20.35%	
-2010	14,848,842	21.13%	
-2018	15,642,626	22.26%	

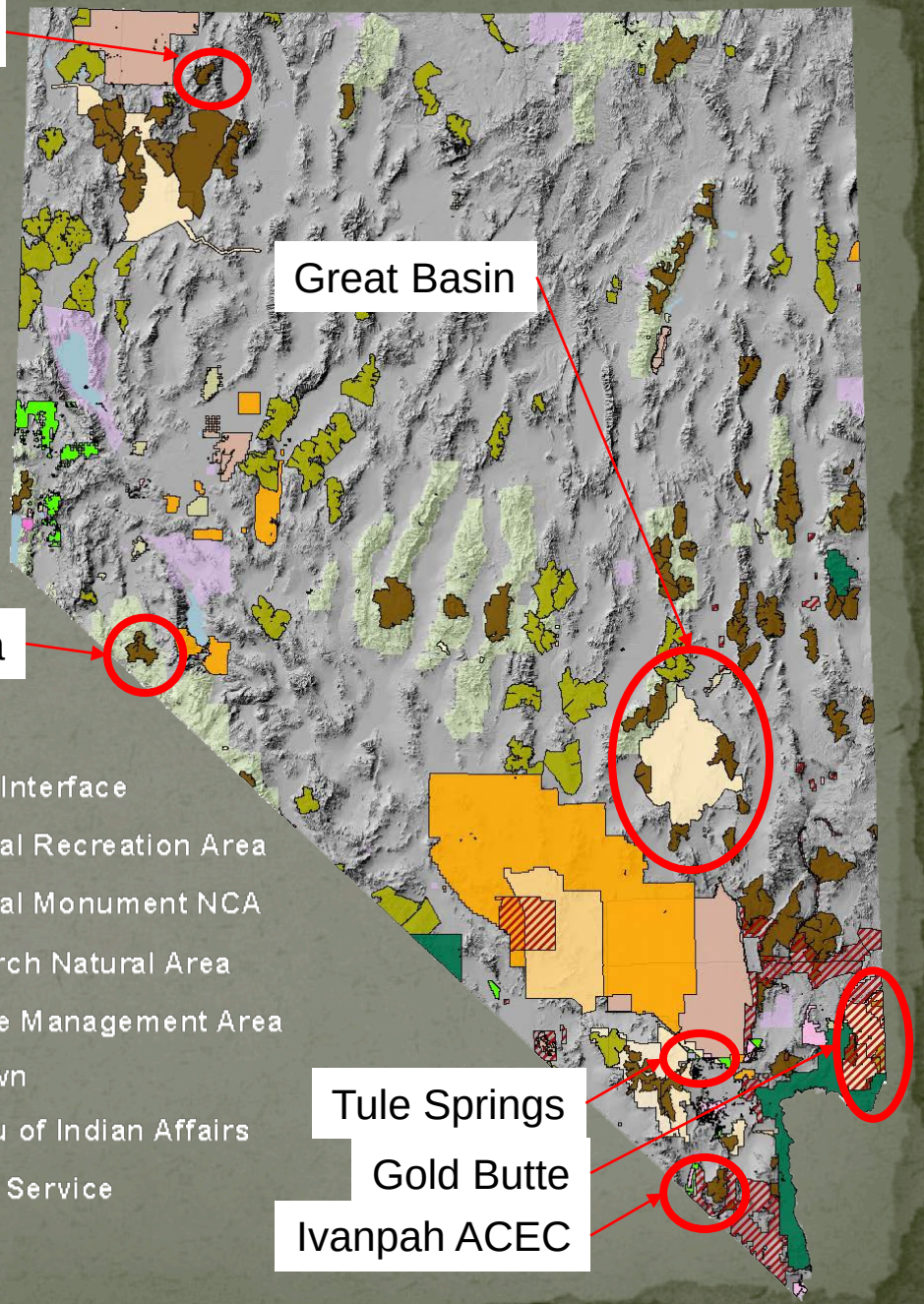
Nevada Land Withdrawals to May, 2018





Nevada Land Withdrawal Status

through May, 2018



Legend

Withdrawn
- State or County Land
- Department of Defense
- Department of Energy
- Fish and Wildlife
- National Park
- Regional Park
- Area of Critical Environmental Concern
- Wilderness
- Wilderness Study Area
- Urban Interface
- National Recreation Area
- National Monument NCA
- Research Natural Area
- Wildlife Management Area

Non-Withdrawn
- Bureau of Indian Affairs
- Forest Service
- Water

Total Land Area Withdrawals through May, 2018

Land Use	Acres	% of Total Withdrawn	% of Nevada
Wilderness[1]	2,469,729	15.79%	3.51%
Wilderness/National Monument & National Conservation Area	500,244	3.20%	0.71%
Wilderness/National Park & Recreation Area	78,492	0.50%	0.11%
Wilderness/Research Natural Area	25,477	0.16%	0.04%
Wilderness/Research Natural Area/National Park & Recreation Area	3,987	0.03%	0.01%
Wilderness/Areas of Critical Environmental Concern	142,550	0.91%	0.20%
Wilderness/National Conservation Area/Areas of Critical Environmental Concern	405	0.00%	0.00%
Instant & Wilderness Study Areas[2]	2,646,911	16.92%	3.77%
Instant & Wilderness Study Area/National Park & Recreation Area	59,862	0.38%	0.09%
Instant & Wilderness Study Area/Areas of Critical Environmental Concern	4,439	0.03%	0.01%
Urban Interface[10]	254,811	1.63%	0.36%
Urban Interface/Areas of Critical Environmental Concern	752	0.00%	0.00%
Research Natural Area[4]	13,415	0.09%	0.02%
National Monument & National Conservation Area[3]	1,267,308	8.10%	1.80%
National Monument & National Conservation Area/Areas of Critical Environmental Concern	297,213	1.90%	0.42%
National Monument & National Conservation Area/State Park	528	0.00%	0.00%
Areas of Critical Environmental Concern[5]	948,414	6.06%	1.35%
Military Area[6]	3,366,658	21.52%	4.79%
Military Area/National Wildlife Range & Refuge	845,464	5.40%	1.20%
National Wildlife Range & Refuge[7]	1,556,144	9.95%	2.21%
Wildlife Management Area[8]	98,255	0.63%	0.14%
National Park & Recreation Area[9]	929,928	5.94%	1.32%
State Park	131,640	0.84%	0.19%
Totals	15,642,626	100.00%	22.26%

*see slide notes for sources

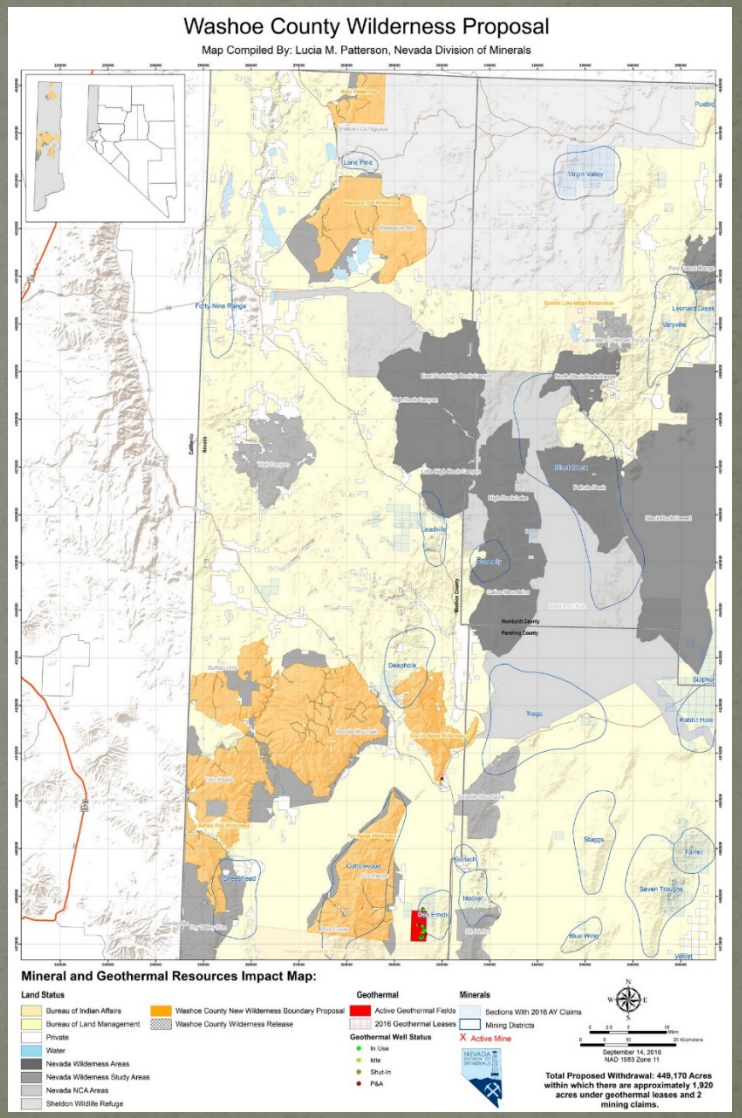
Total Land Area Withdrawals through 2018 (Major Categories)

Land Use	Acres	% of Total Withdrawn	% of Nevada
Military[1]	4,212,122	26.93%	5.99%
Wilderness[2]	3,220,885	20.59%	4.58%
Instant & Wilderness Study Area[3]	2,711,212	17.33%	3.86%
National Wildlife Range & Refuge[4]	1,556,144	9.95%	2.21%
Areas of Critical Environmental Concern[5]	948,414	6.06%	1.35%
National Park & Recreation Area[6]	929,928	5.94%	1.32%
National Monument & National Conservation Area[7]	1,565,049	10.01%	2.23%
Urban Interface[8]	255,563	1.63%	0.36%
Wildlife Management Area[9]	98,255	0.63%	0.14%
State Park[10]	131,640	0.84%	0.19%
Research Natural Area[11]	13,415	0.09%	0.02%
Totals	15,642,626	100.00%	22.26%

1. The Military total includes portions of the National Wildlife Range & Refuge.
2. The Wilderness total includes portions of the National Conservation Area, Research Natural Area, Areas of Critical Environmental Concern, and Wildlife Management Area. Some portions of National Parks are included, though some are not.
3. The Instant & Wilderness Study Area includes portions of the National Park and Recreation Area and the Areas of Critical Environmental Concern.
4. The National Wildlife Range and Refuge total is only that area not included in the Military Area.
5. The Areas of Critical Environmental Concern total is only that area not included in the Wilderness Area, the Instant and Wilderness Study Area, the Urban Interface Area, Fish and Wildlife Refuge Area and the National Conservation Area.
6. The National Park and Recreation Area total is only that area not included in the Wilderness Area and the Instant and Wilderness Study Area.
7. The National Conservation Area total includes portions of the Areas of Critical Environmental Concern and State Park Area.
8. The Urban Interface Area total includes portions of the Areas of Critical Environmental Concern.
9. The Wildlife Management Area total is only that area not included in any other withdrawn areas.
10. The State Park Area total is only that area not included in the National Conservation Area or Areas of Critical Environmental Concern.
11. The Research Natural Area total is only that area not included in other withdrawn areas.

Proposed Land Withdrawals as of May, 2018

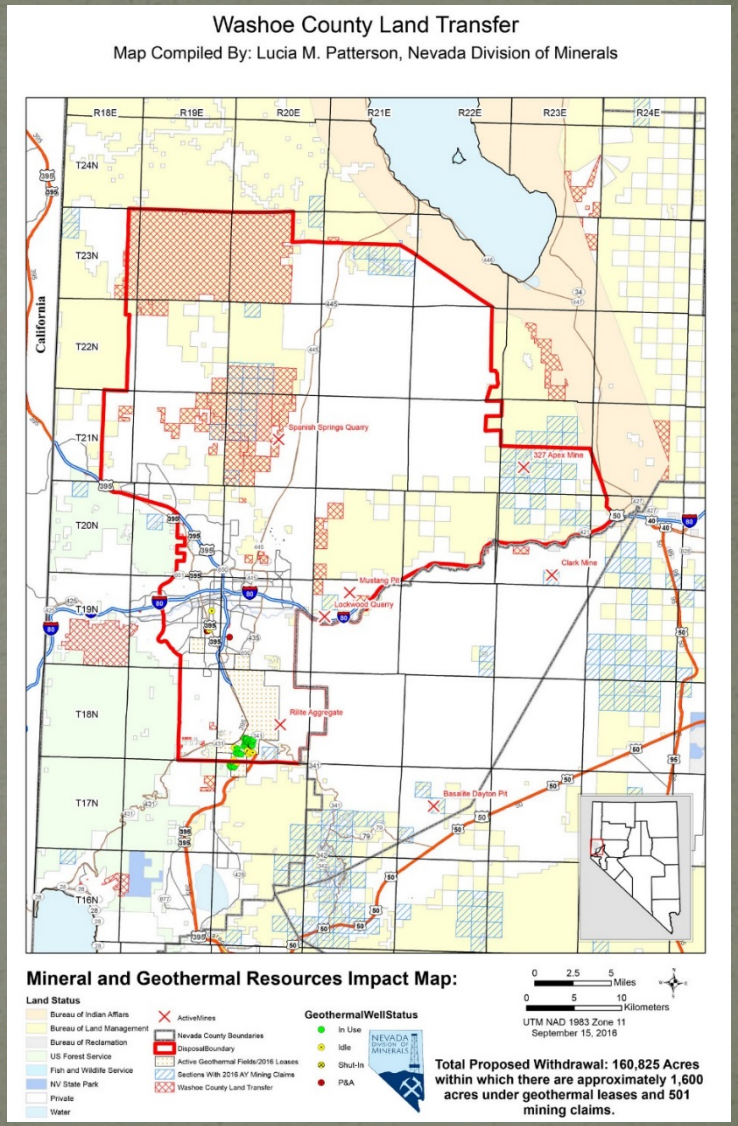
- Washoe County Wilderness Proposals
  - 600,421 acres currently designated WSA
    - 369,576 acres of WSA to be released
    - 147,516 acres of new wilderness (mostly from WSA)
    - 83,329 acres converted to NCA (mostly from WSA)
    - Net 111,721 acre release of preexisting withdrawn land
  - Additional proposed wilderness outside of WSAs
    - Burro Mountain & Granite-Banjo - 27,010 acres new withdrawal



https://www.washoecounty.us/csd/planning_and_development/conservation-act.php; accessed 30 May, 2018

Proposed Land Withdrawals as of May, 2018

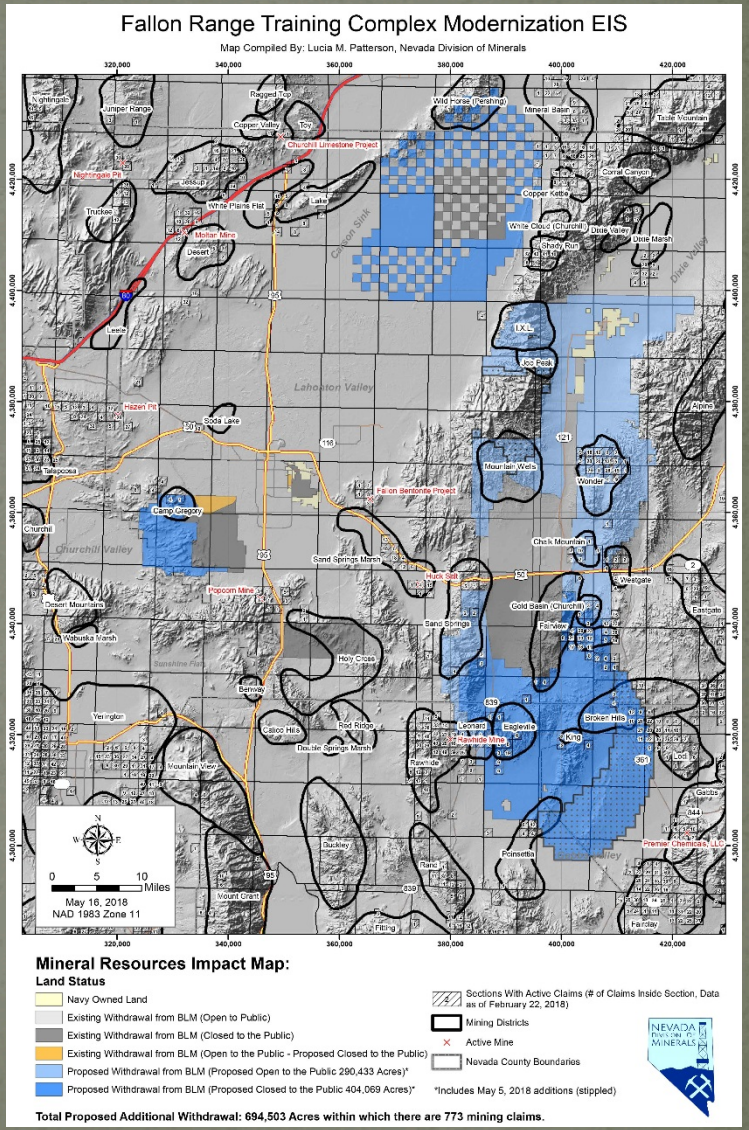
- Washoe County Land Transfer
  - 8,735 acres converted from BLM/USFS to private



https://www.washoecounty.us/csd/planning_and_development/conservation-act.php; accessed 30 May, 2018

Proposed Land Withdrawals as of May, 2018

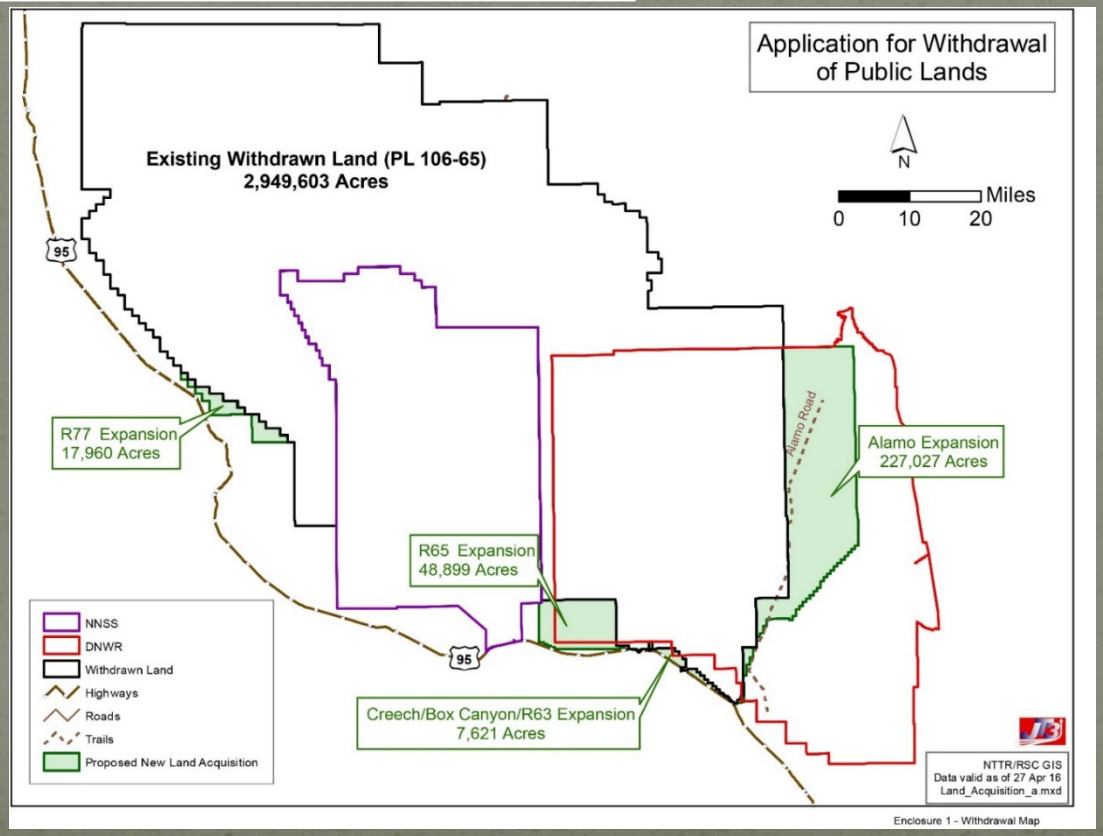
- Fallon Range Training Complex Modernization Expansion
  - 649,504 acres of new withdrawal



https://frtcmodernization.com; accessed 30 May, 2018

Proposed Land Withdrawals as of May, 2018

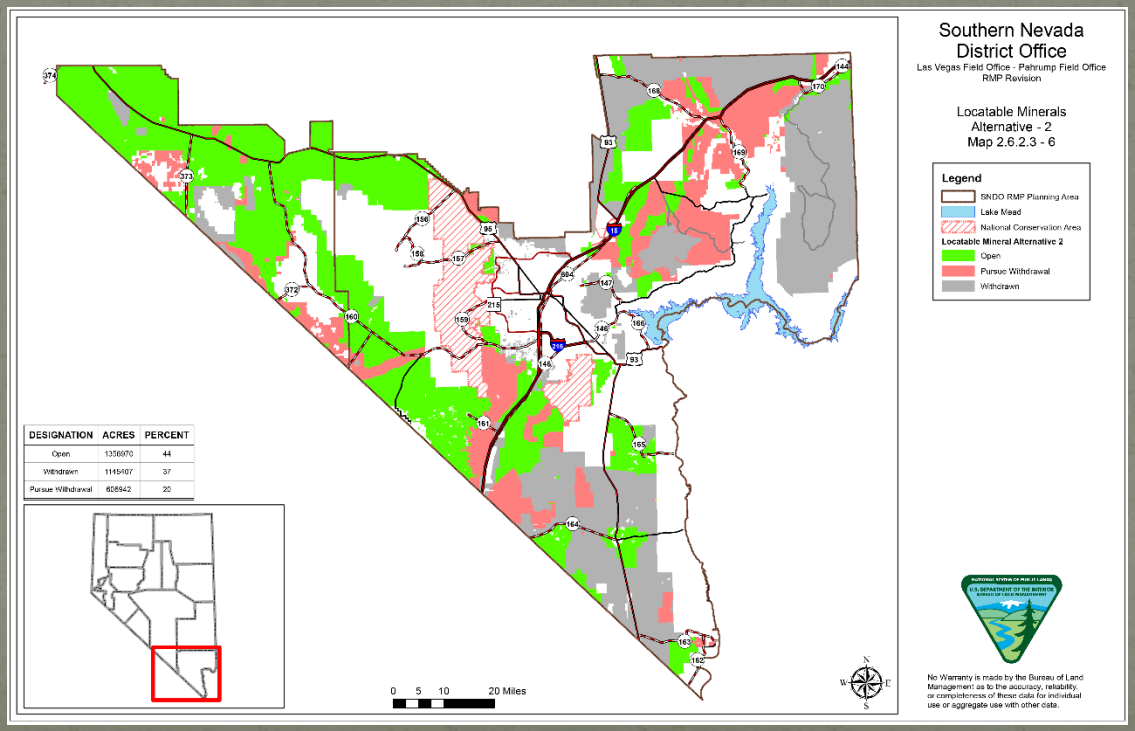
- Nellis Test and Training Range (NTTR)
  - 301,000 acres across all proposed alternatives
    - 265,811 acres within previously withdrawn lands (Desert National Wildlife Refuge)
    - Net 35,189 acres of new withdrawal



http://www.nttrleis.com/; accessed 30 May, 2018.

Proposed Land Withdrawals as of May, 2018

- Las Vegas and Pahrump Field Office Draft Resource Management Plan – Alternative 2 (most restrictive)
  - 608,942 acres to be withdrawn
    - 41,320 acres already within other areas of locatable-mineral withdrawal
    - Net 567,622 acres of new withdrawal



https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=2900; accessed 30 May, 2018. Map provided by BLM Southern Nevada District Office.

Proposed Land Withdrawals as of May, 2018

Proposed Locatable Mineral Withdrawals Summary

- Washoe County Economic Development and Conservation Act:
  - Wilderness, Wilderness Study Areas (WSAs) and National Conservation Areas (NCAs): 257,855 acres
    - 174,526 acres designated wilderness
    - 83,329 acres designated NCA
    - 369,576 acres of WSA released
      - Net 111,721 acre release of preexisting withdrawn land
  - Washoe County Economic Development and Conservation Act:
    - 8,735 acres converted from BLM/USFS to Private.
- DOD Expansions:
  - Nellis Test and Training Range (NTTR): 301,016 acres
    - Includes acreage for all proposed alternatives
    - 265,811 acres within previously withdrawn lands (Desert Refuge)
    - Net 35,205 acres of new withdrawal
  - Fallon Naval Air Station: 649,504 acres

Continued on next slide

Proposed Land Withdrawals as of May, 2018

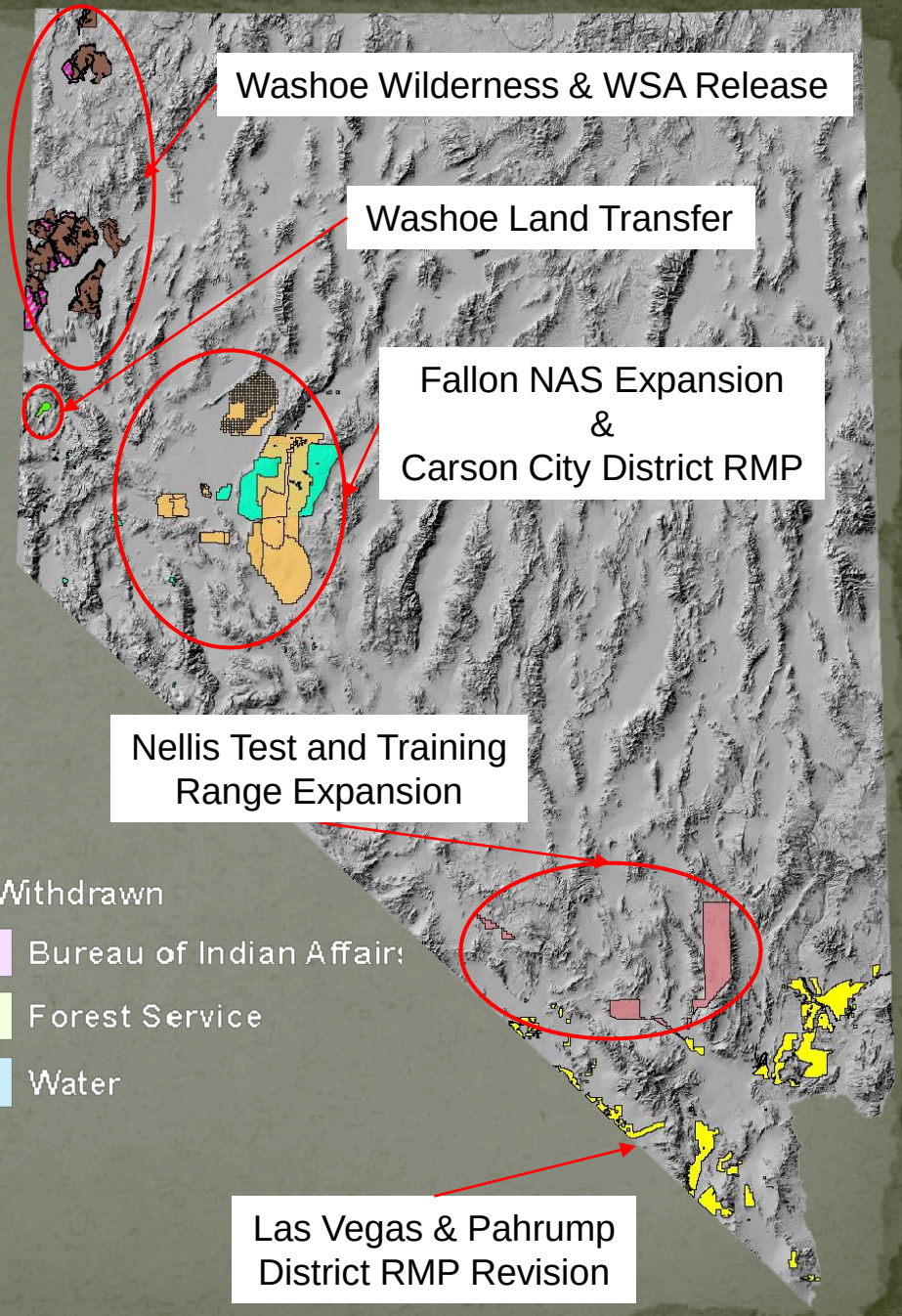
- Resource Management Plan Revision:
  - Carson City RMP Revision, Alternative E (BLM Preferred): 470,603 acres withdrawn
    - 197,322 acres already within other areas of locatable-mineral withdrawal
    - Net 273,281 acres of new withdrawal
  - Las Vegas and Pahrump Field Office RMP Revision, Alternative 2: 608,942 acres withdrawn

    *largest locatable-mineral-withdrawal alternative, no specified BLM preferred alternative as of May, 2018)
    - 41,320 acres already within other areas of locatable-mineral withdrawal
    - Net 567,622 acres of new withdrawal

Net total proposed locatable-mineral-withdrawal acreage : 1,310,905 acres
Net increase as a percentage of current withdrawal acreage: 8.38%
Net proposed withdrawn acreage as a percentage of Nevada: 1.87%

*Notable withdrawals listed; this list is not exhaustive

Proposed Nevada Land Withdrawals May, 2018



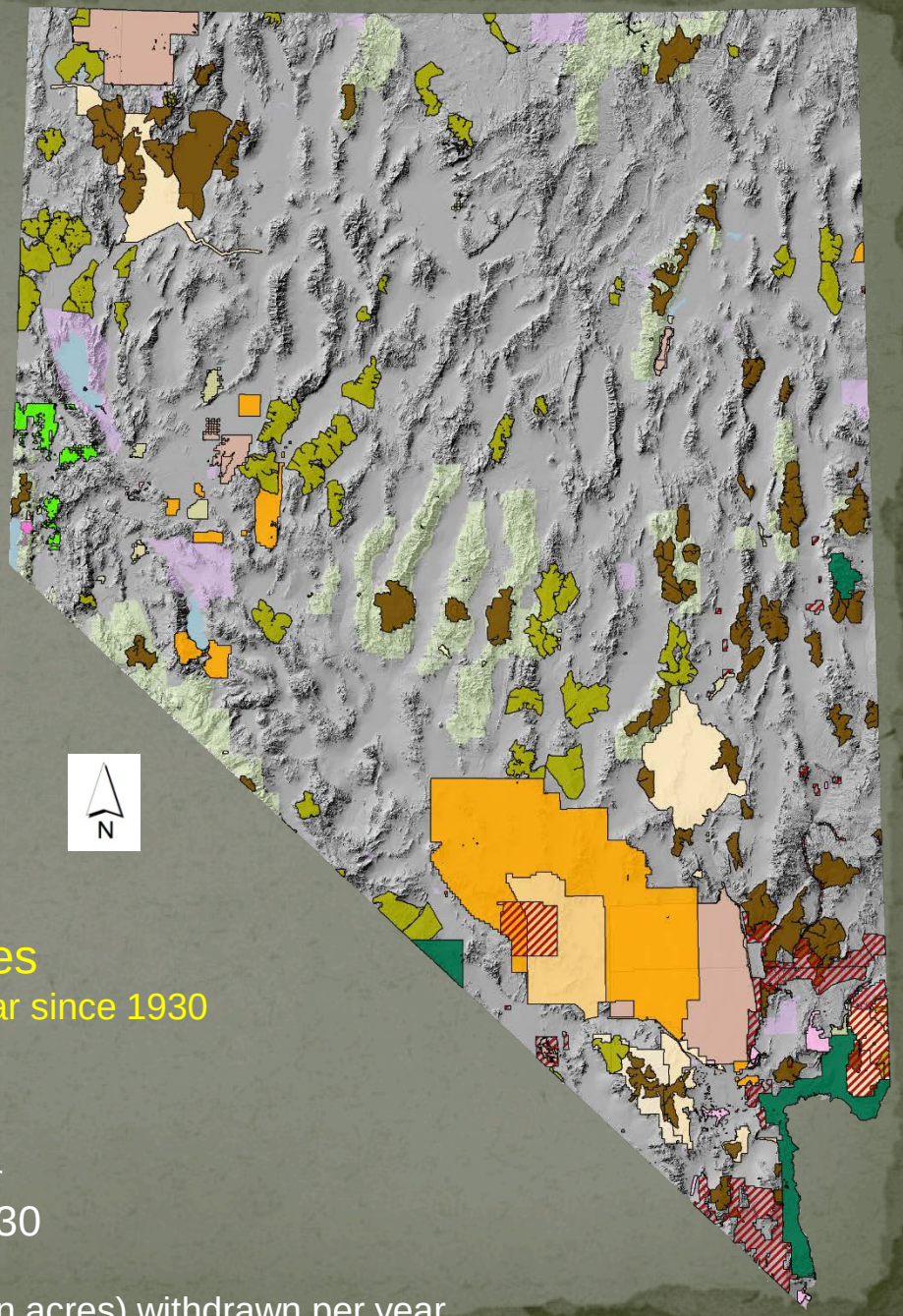
Legend

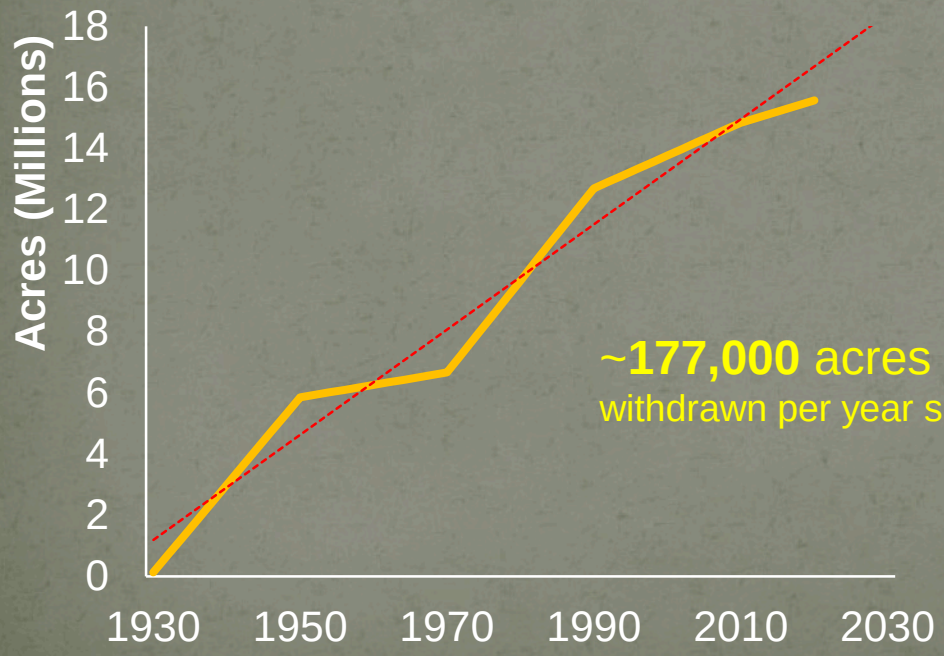
- Washoe Proposed WSA Release
- Washoe Proposed Wilderness
- Washoe Land Transfer
- Fallon Range Training Complex
- Nellis Test and Training Range
- Carson City RMP Alternative-E
- Las Vegas & Pahrump RMP Alternative-2

Non-Withdrawn

- Bureau of Indian Affairs
- Forest Service
- Water

Nevada Land Withdrawal Status May, 2018



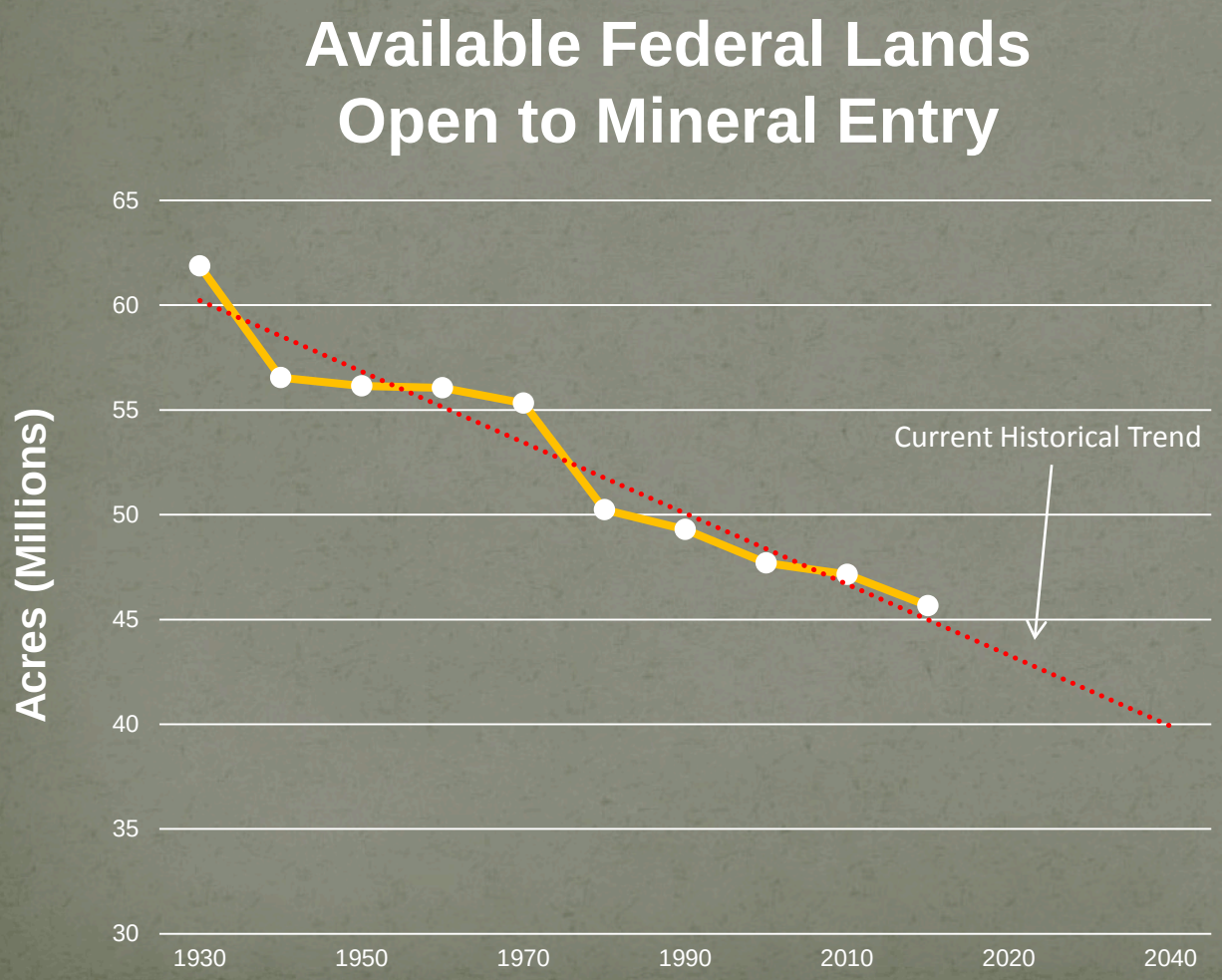


~177,000 acres
withdrawn per year since 1930

Line graph displaying the trend in the amount of land (in acres) withdrawn per year.

Current Historical Trend

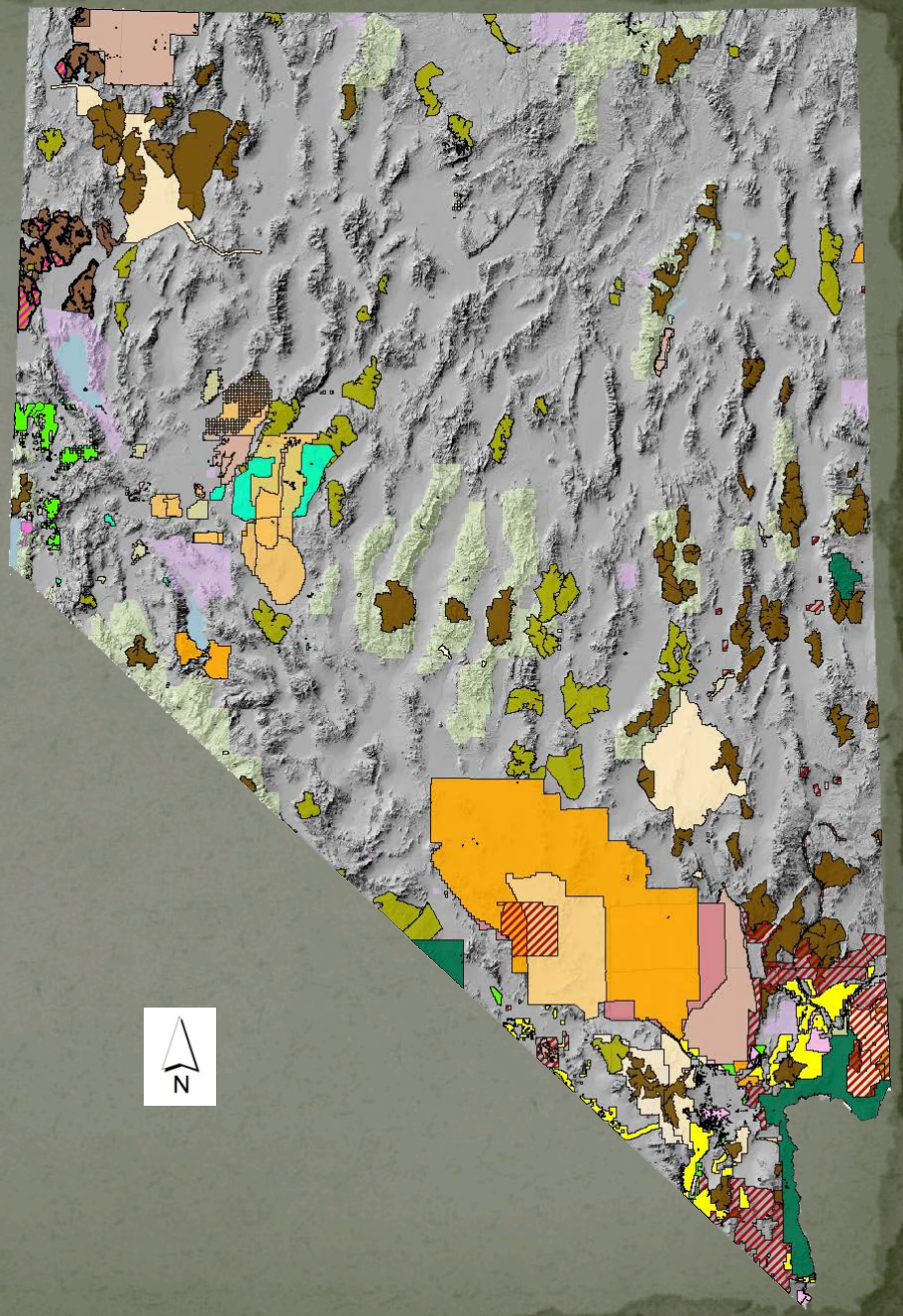
(Summary Result)



The chart to the left depicts the decrease in federal lands open to locatable mineral entry by decade. Since 1930, approximately 1,770,000 acres of land are withdrawn each decade.

Current and Proposed Locatable Mineral Withdrawals

as of May, 2018



Nevada Land Withdrawals from Mineral Entry
A Historical Perspective

May, 2018 update

University of Nevada, Reno

Modified from original study in 2011 by:
S. Bassett, I. Morrison, and K. Berry
Department of Geography
Mackay School of Earth Sciences and Engineering,
College of Science
University of Nevada, Reno

NEVADA DIVISION OF MINERALS

Updated in May, 2018 by:

Garrett A. Wake
Nevada Division of Minerals
gwake@minerals.nv.gov
Minerals.nv.gov

II. D Consideration of funding a minerals and geology display at the Las Vegas Natural History Museum.

REQUEST FROM MARYLYN GILLESPIE, LV Natural History Museum Executive Director 7/27/18

Rich,

I wanted to get back in touch with you regarding our project. Attached you will find illustrations of two interactive tables I hope you will be interested in purchasing for the Museum's new Geology Gallery. The exhibit's objective is for visitors to have a better understanding of foundational geology concepts. The game-based activity will highlight the differences between rocks and minerals. Visitors will be challenged to use clue cards to identify different rocks and minerals. The samples will be affixed to the lift up doors which will contain the correct answer.

The total cost for both of these display tables is $47,100, which includes design, construction of the tables, graphic panels and interactive components. I would also like to request your assistance in obtaining the rocks and minerals to be used in the exhibit.

Additionally, after talking to Dylan with the Mining Association, I am putting together a specific request for their support of another interactive exhibit, which will explore the economic minerals of Nevada, their uses, and where they are found in Nevada.

Please let me know if you need anything else or have any questions. Your interest in our project is greatly appreciated.

Thank you,
Marilyn

COMMENTS FROM AUBREY BONDE, Field Specialist, NDOM, Las Vegas

1) I like that these are investigative and hands-on activity stands and they do a fine job at communicating some basic geology but something to think about is if this is the type of educational piece that NDOM wants to sponsor - in your opinion does this address our mission?

2) I'm not sure how adaptable the vendors are on putting together these displays, but it seems to me that there are ways to maximize the information to be gained. For example, I like the rock ID game but I don't necessarily think the rock sorting game is all that informative. I am wondering if it would be possible to modify the stand so that the sorting game could be replaced with rock/mineral uses. Also, I know I don't have a lot of experience in exhibition design but $47K seems a hefty price tag for two displays that have no electrical elements or components. It would be neat to have the rock ID game and then an animation that accompanies each rock type showing a very short video for how each of the different rocks form. I think this would be a far more effective way to show rock formation and classification than the sorting game. Again, I think more could be done to the minerals sorting table to maximize minerals education, some modifications could help expand education on mineral properties and names.

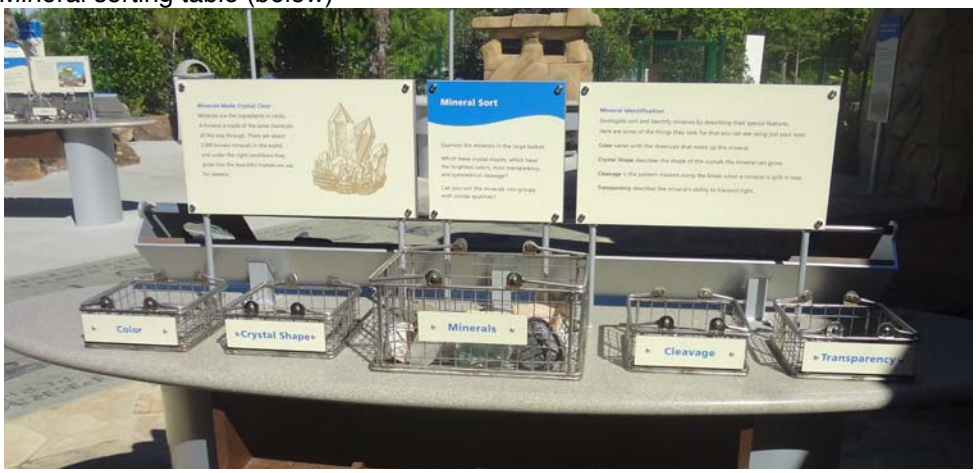
3) I think that the concept of the tables are versatile enough so that young children can get something from them by being able to investigate the rock/mineral samples (Preschool - 3rd grade), and then the text is more appropriate for 4-5th grades on up to adults. In that way, they reach all age groups which is what you want to strive for in a museum display.

4) The last thought I had is that the tables should use samples that NDOM can procure in abundance since hands-on pieces in museums are frequently broken/stolen.

Rock ID game with lift up doors and clue cards

Front view of Rock sorting table (above)

Mineral sorting table (below)



III. OLD BUSINESS

III. A Presentation and possible approval of the NDOM 2020-21 biennium budget

THIS SECTION IS INTENTIONALLY LEFT BLANK.

HAND OUTS AND PRESENTATION WILL BE GIVEN AT THE MEETING.

III. B AML Program: Broken Hills Mine Closure Project, Gold Butte Project and AML Summer intern work completed

2018 AML Update

Rob Ghiglieri

Commission on Mineral Resources Quarterly Meeting

August 23, 2018

Eureka NV

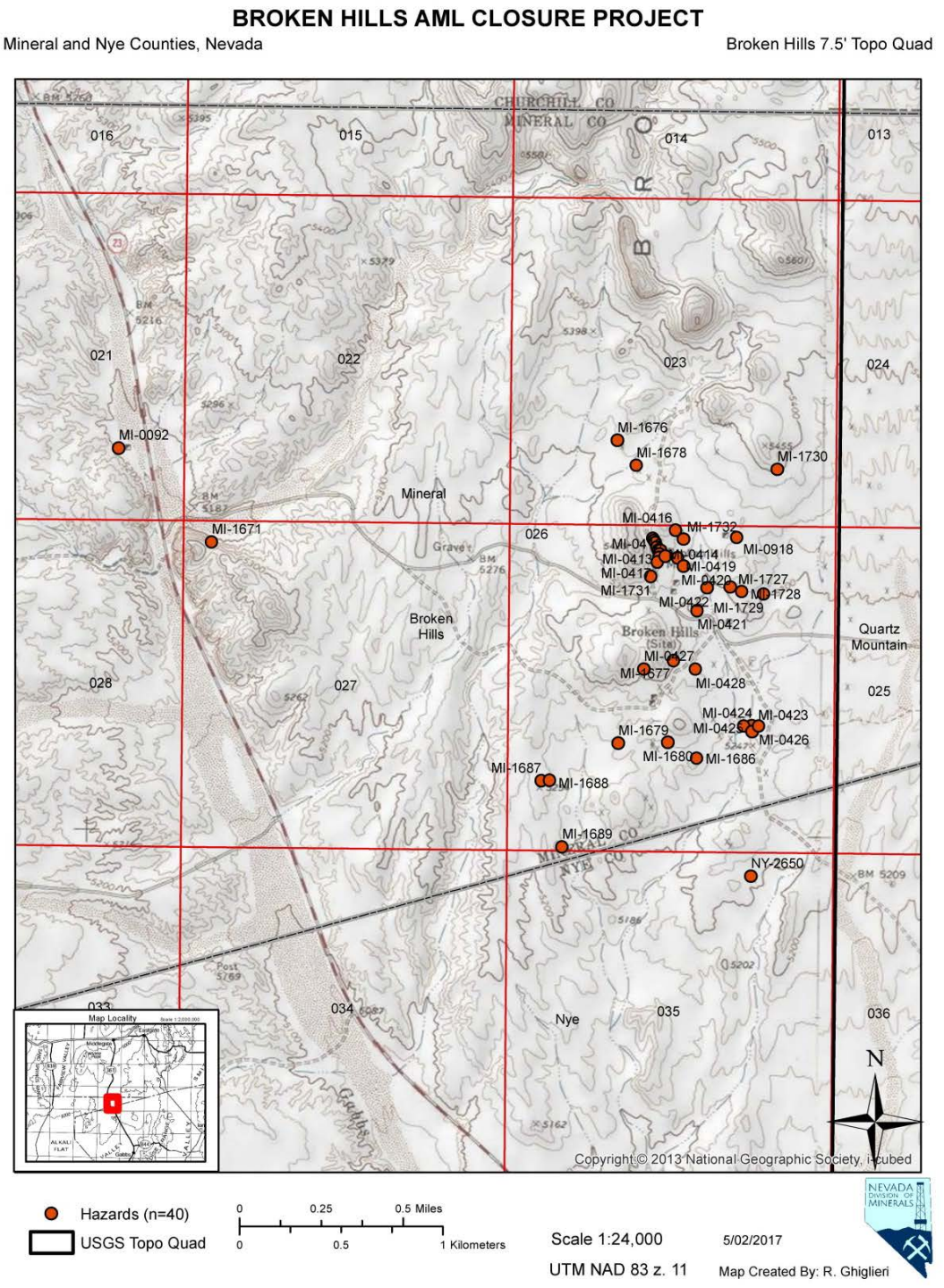
Overview

- LY-1172
- Broken Hills Closure Project
- Gold Butte AML Project
- 2018 Summer Interns
- Future Closure Projects

LY-1172

Broken Hills

- 40 hazards inventoried from 1994-2016
- Multiple stopes over 40’ long x 20’ wide x 150’ deep and vehicle access only feet away
- Public (family with small children) seen using the ladder on the headframe and entering the mine
- Identified as a potential closure project in 2010 by Mike Visher
- Finished inventories in 2015 & 2016 and started wildlife and cultural surveys in 2016
- 19 Bat Compatible Closures
- 528 bars of 2”x2” 20’ long square tube steel used on the stopes alone
- Total cost of $155,072.33



Broken Hills

MI-1688
Secured
6/30/18
Looking NW

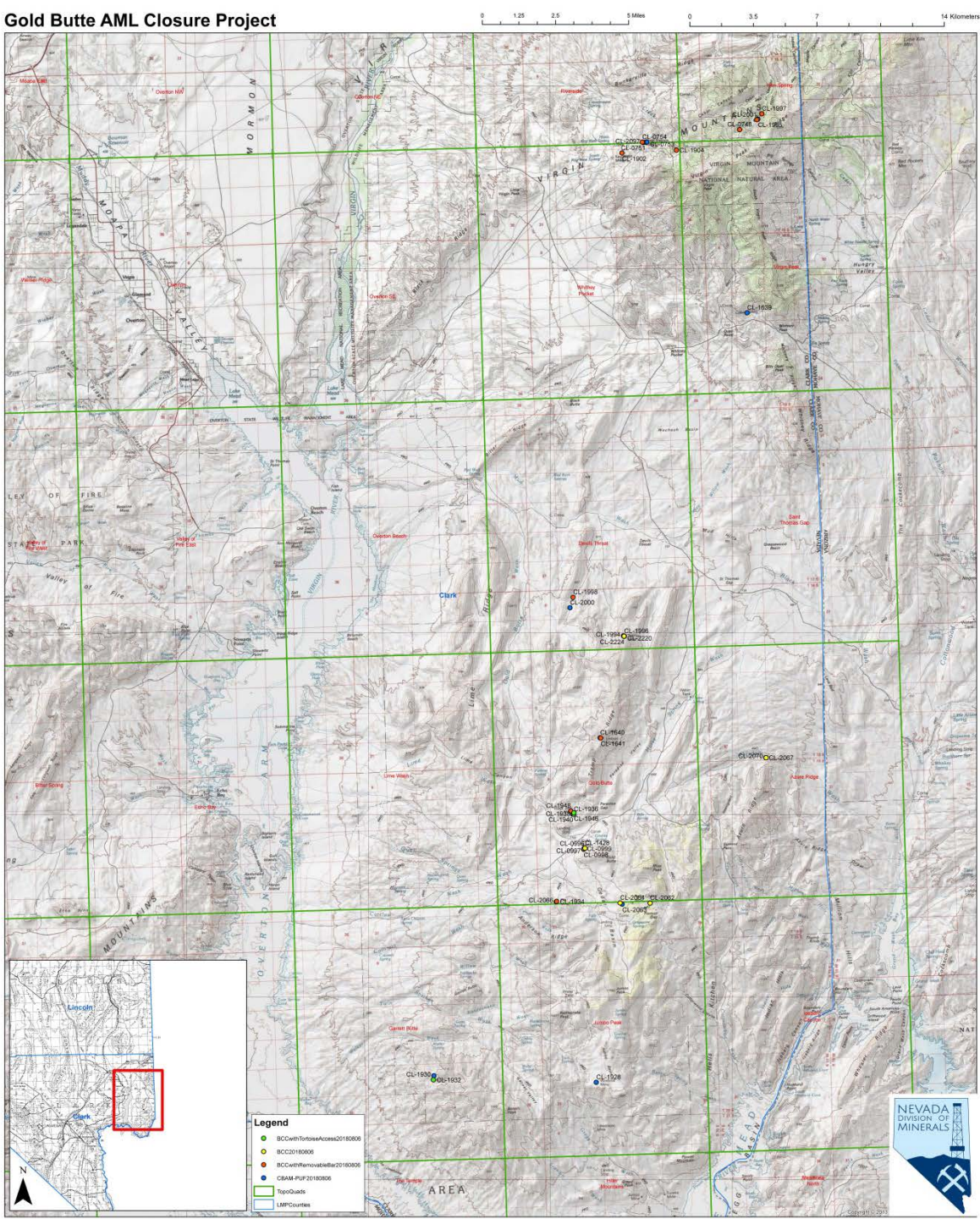

MI-1731
Secured
6/30/18
Looking S


MI-423
7-28-94


MI-0423
Secured
6/30/18
Looking N

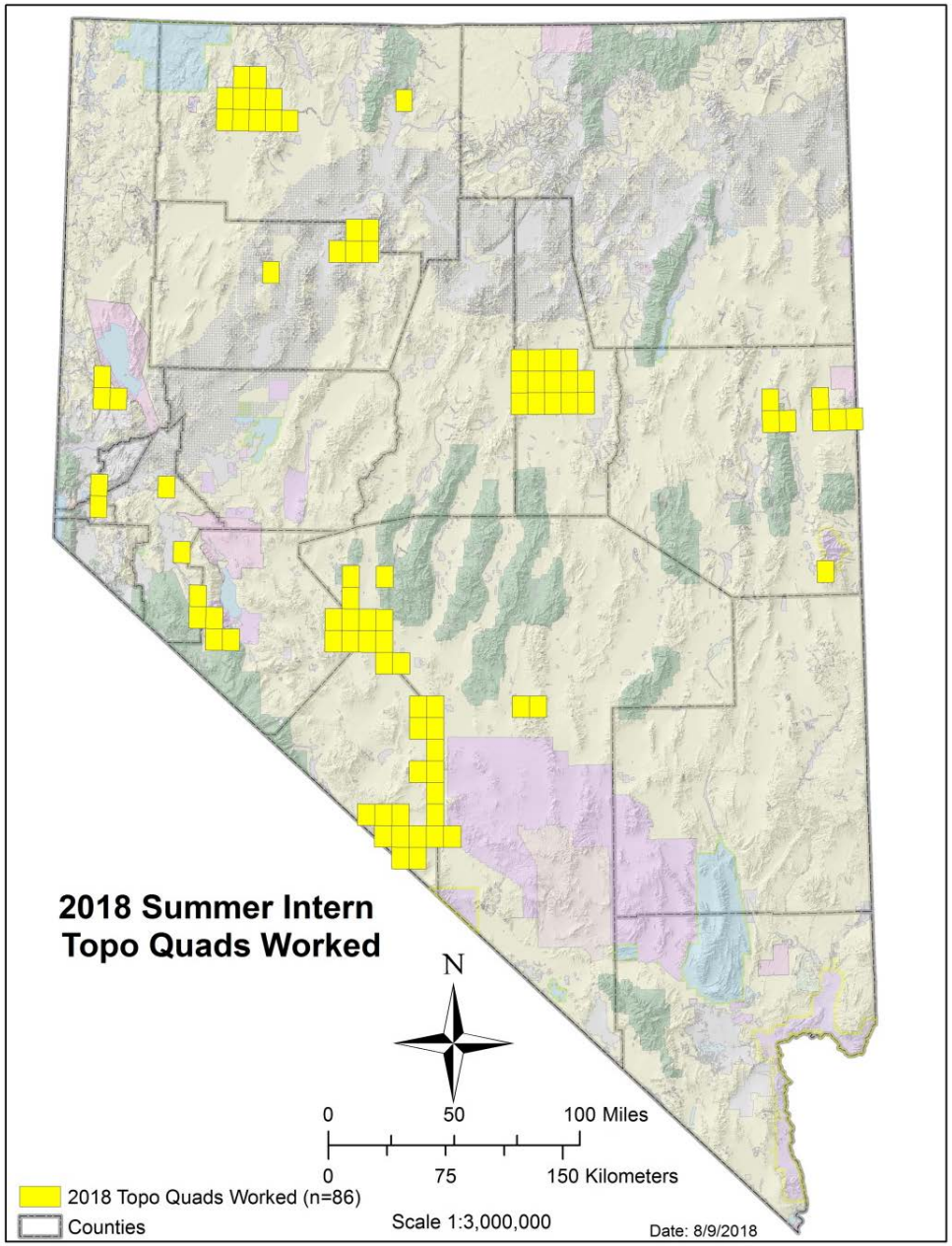
Gold Butte

- 42 hazards within the entire Gold Butte National Monument
  - Managed by LV BLM
  - CX in approval process
- Interlocal contract with Clark County Desert Conservation
  - Anticipated contract approval dates
    - BOE on 8/14/2018
    - IFC on 8/16/2018
  - $193,000 total funding available
  - Must be used for wildlife compatible closures only in Clark County
  - 18 hazards determined to have significant wildlife habitat
    - 3 hazards including tortoise habitat
- Anticipated construction 9/10/2018 – 10/31/2018



2018 Summer Interns

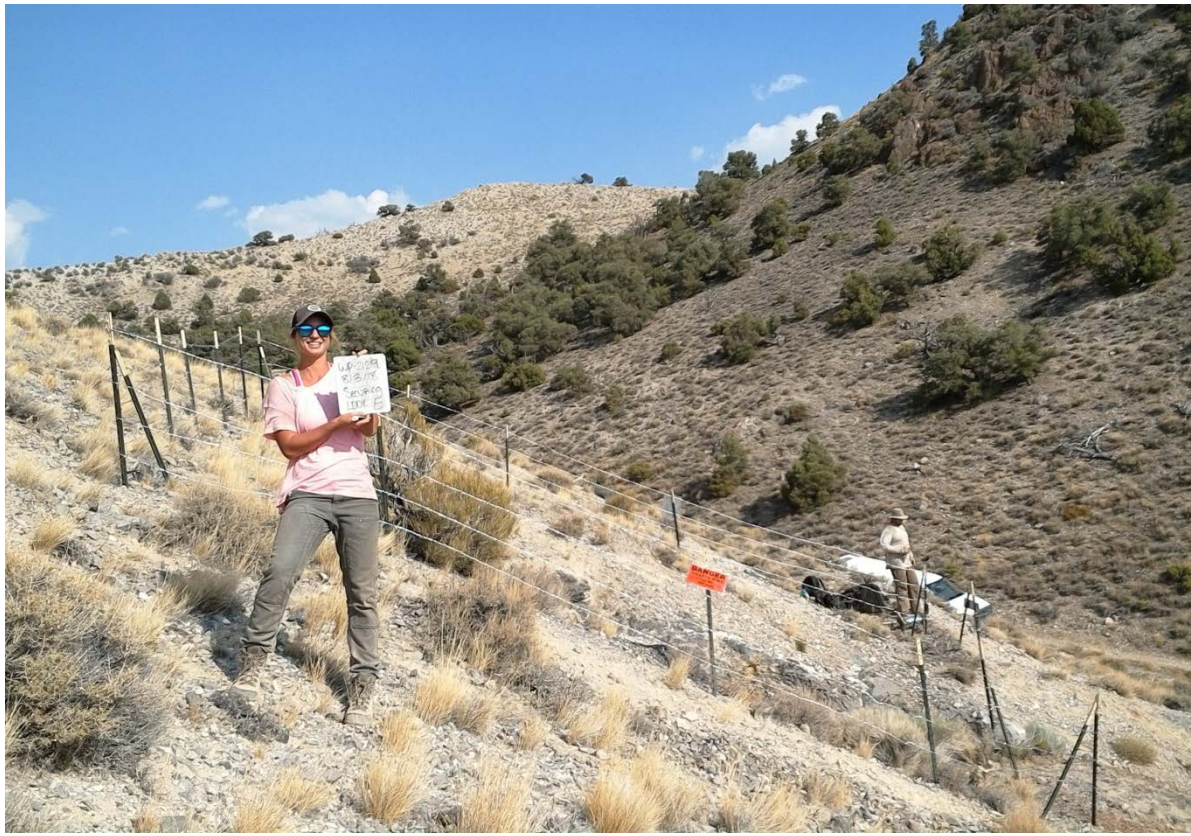
2018 Summer Intern Tentative Numbers



- 7 Interns
- 13 Weeks
- 50 Field days
- >4,500 Field man hours
- 10 Counties
- Over 25,000 miles traveled
- 557 Inventories
- 413 Revisits
- 209 Securings
- 7,359 Non-Hazards
- 0 Safety incidents
- 1 Truck incident with damage

Future Closure Projects

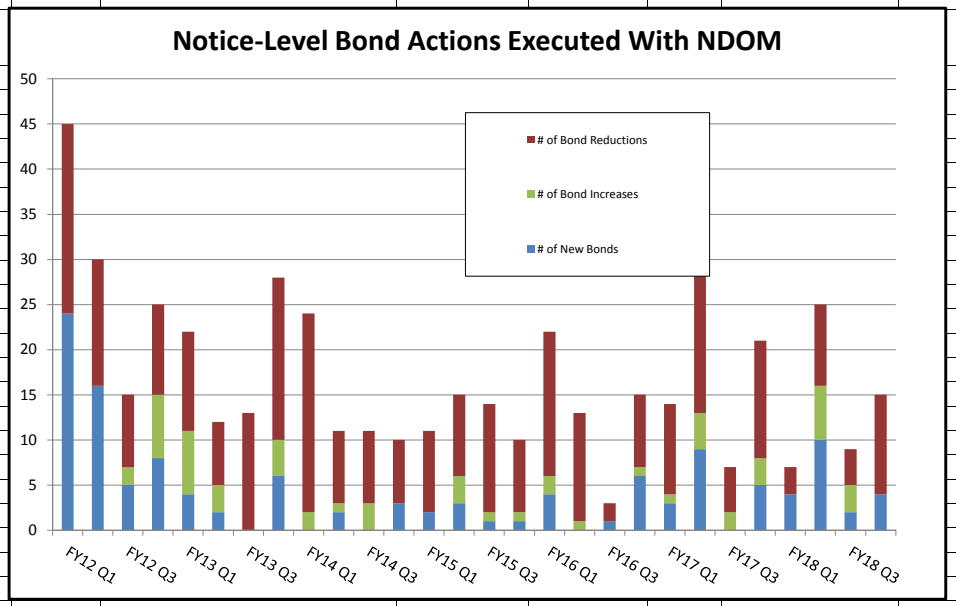
- Gunmetal Mine (10)
- Nevada Eagle (43)
- Double O (round 2, 81)
- Walker River State Park (107)
- VC Grand Prix (21)
- Mullen Pass (30)
- Como (26)



IV. STAFF REPORTS

Reclamation Bond Pool Status Report		Current to:	7/31/2018							
Plan-level Bonds -Company	**Project**	**Entry Date**	**Bond Amount**	**% of Pool**	**Comments**	**Deposit**	**Premiums Paid**	**% Bond Whole**	**Premium Schedule**	**Current thru**
Custom Details	Bovie-Lew	11/17/2006	$24,364.00	0.75%		$ 12,217.11	$20,618.78	134.8%	$182.73 quarterly	9/30/2018
New Gold Nevada (formerly NV Rae)	Black Rock Canyon	4/15/2005	$727,087.00	22.39%		$ 415,856.34	$326,760.84	102.1%	$5,453.15 quarterly	6/30/2018
So. NV Liteweight	Money Pit	5/21/2004	$430,088.00	13.24%		$ 233,171.91	$259,854.22	114.6%	$3,225.66 quarterly	9/30/2018
Western Pacific Clay	Fallon Bentonite	12/11/1997	$209,900.00	6.46%	terminated	$ 31,485.00	$185,648.94	103.4%		
Western Mine Dev.	Victorine Mine	5/24/2000	$45,875.39	1.41%	terminated	$ -				
Western Mine Dev.	Kingston Mill	5/24/2000	$100,450.00	3.09%	terminated	$ -				
Western Mine Dev.	Manhattan Mill	5/24/2000	$114,288.77	3.52%	terminated	$ -				
TNT Venture	Big Canyon	1/27/2010	$78,161.00	2.41%		$ 39,615.03	$43,875.59	106.8%	$586.21 quarterly	6/30/2018
Dun Glen Mining	Dun Glen	8/11/2014	$373,981.00	11.51%		$ 200,648.22	$135,020.19	**89.8%**	$8,780.45 quarterly	6/30/2018
Statewide Notice-Level	**Various**	**various**	**$1,143,830.00**	**35.22%**	**78 Notice-level bonds**					
									Premiums due	
Total Bonded Amount			**$3,248,025.16**	**100.00**						
Cash in Pool's Account			**$4,240,961.78**							
Unfunded Amount			**-$992,936.62**							
Percent funded			**130.6%**							

Date	# of New Bonds	# of Bond Increases	# of Bond Reductions
FY12 Q1	24	0	21
FY12 Q2	16	0	14
FY12 Q3	5	2	8
FY12 Q4	8	7	10
FY13 Q1	4	7	11
FY13 Q2	2	3	7
FY13 Q3	0	0	13
FY13 Q4	6	4	18
FY14 Q1	0	2	22
FY14 Q2	2	1	8
FY14 Q3	0	3	8
FY14 Q4	3	0	7
FY15 Q1	2	0	9
FY15 Q2	3	3	9
FY15 Q3	1	1	12
FY15 Q4	1	1	8
FY16 Q1	4	2	16
FY16 Q2	0	1	12
FY16 Q3	1	0	2
FY16 Q4	6	1	8
FY17 Q1	3	1	10
FY17 Q2	9	4	19
FY17 Q3	0	2	5
FY17 Q4	5	3	13
FY18 Q1	4	0	3
FY18 Q2	10	6	9
FY18 Q3	2	3	4
FY18 Q4	4	0	11



LITHIUM

(Data in metric tons of lithium content unless otherwise noted)

Domestic Production and Use: The only lithium production in the United States was from a brine operation in Nevada. Two companies produced a wide range of downstream lithium compounds in the United States from domestic or imported lithium carbonate, lithium chloride, and lithium hydroxide. Domestic production was withheld to avoid disclosing company proprietary data.

Although lithium markets vary by location, global end-use markets are estimated as follows: batteries, 46%; ceramics and glass, 27%; lubricating greases, 7%; polymer production, 5%; continuous casting mold flux powders, 4%; air treatment, 2%; and other uses, 9%. Lithium consumption for batteries has increased significantly in recent years because rechargeable lithium batteries are used extensively in the growing market for portable electronic devices and increasingly are used in electric tools, electric vehicles, and grid storage applications. Lithium minerals were used directly as ore concentrates in ceramics and glass applications.

Salient Statistics—United States:	**2013**	**2014**	**2015**	**2016**	**2017[e]**
Production	[1]870	W	W	W	W
Imports for consumption	2,210	2,130	2,750	3,140	3,430
Exports	1,230	1,420	1,790	1,520	1,850
Consumption, estimated	2,000	[2]2,000	[2]2,000	[2]3,000	[2]3,000
Price, annual average, battery-grade lithium carbonate, dollars per metric ton[3]	6,800	6,690	6,500	8,650	13,900
Employment, mine and mill, number	70	70	70	70	70
Net import reliance[4] as a percentage of estimated consumption	>50	>25	>25	>50	>50

Recycling: Historically, lithium recycling has been insignificant but has increased steadily owing to the growth in consumption of lithium batteries. One domestic company has recycled lithium metal and lithium-ion batteries since 1992 at its facility in British Columbia, Canada. In 2009, the U.S. Department of Energy awarded $9.5 million to the company to construct the first U.S. recycling facility for lithium-ion vehicle batteries and, in 2015, the facility in Lancaster, OH, began operation.

Import Sources (2013–16): Chile, 49%; Argentina, 48%; China, 2%; and other, 1%.

Tariff: Item	**Number**	**Normal Trade Relations 12–31–17**
Other alkali metals	2805.19.9000	5.5% ad val.
Lithium oxide and hydroxide	2825.20.0000	3.7% ad val.
Lithium carbonate:		
U.S. pharmaceutical grade	2836.91.0010	3.7% ad val.
Other	2836.91.0050	3.7% ad val.

Depletion Allowance: 22% (Domestic), 14% (Foreign).

Government Stockpile: The Defense Logistics Agency Strategic Materials planned to acquire 600 kilograms of lithium cobalt oxide and 2,160 kilograms of lithium nickel cobalt aluminum oxide in FY 2018.

Stockpile Status—9–30–17[5]

Material	**Inventory**	**Disposal Plan FY 2017**	**Disposals FY 2017**
Lithium cobalt oxide (kilograms, gross weight)	450	—	—
Lithium nickel cobalt aluminum oxide (kilograms, gross weight)	1,550	—	—

Events, Trends, and Issues: Worldwide lithium production increased by an estimated 13% to 43,000 tons in 2017 in response to increased lithium demand for battery applications. Consumption of lithium in 2017 was projected to be about 41,500 tons, up from 36,700 tons in 2016. Production in Australia increased by approximately 34% as two new spodumene operations ramped up production of concentrate throughout 2017. The leading lithium producers in Argentina, Australia, and Chile reported strong sales; however, heavy snowfall limited production at Argentina's new brine operation. Worldwide lithium production capacity was estimated to be 58,000 tons per year in 2016.

Prepared by **Brian W. Jaskula [(703) 648–4908, bjaskula@usgs.gov]**

LITHIUM

Spot lithium carbonate prices in China ranged from $15,000 to $24,000 per ton throughout the year owing to tight supply of imported spodumene from Australia. The rest of the world experienced more modest price increases owing to supplies available from more diversified sources of lithium. For large fixed contracts, Industrial Minerals reported an annual average U.S. lithium carbonate price of $13,900 per metric ton in 2017, a 61% increase from that of 2016.

Three spodumene operations in Australia and two brine operations each in Argentina and Chile accounted for the majority of world lithium production. Argentina's leading lithium producer expanded its lithium hydroxide production capacity by 80% in 2017 to meet increasing demand from the electric vehicle industry. The joint owners of the leading spodumene operation in Australia planned to double its spodumene concentrate production capacity to 1.34 million tons per year by mid-2019. To diversify supply, Chile's leading lithium producer announced a joint venture with a company in Australia to develop a spodumene operation. This follows a 2016 joint venture that the company in Chile established with a company in Argentina to develop a brine operation. Chile's two lithium producers each announced plans to build lithium hydroxide plants in Australia.

Lithium supply security has become a top priority for technology companies in the United States and Asia. Strategic alliances and joint ventures among technology companies and exploration companies continued to be established to ensure a reliable, diversified supply of lithium for battery suppliers and vehicle manufacturers. Brine operations were under development in Argentina, Bolivia, Chile, China, and the United States; spodumene mining operations were under development in Australia, Austria, Canada, China, Czechia, Finland, Mali, Portugal, and Spain; a jadarite mining operation was under development in Serbia; and lithium-clay mining operations were under development in Mexico and the United States. Additional exploration for lithium continued, with numerous claims having been leased or staked worldwide.

World Mine Production and Reserves: Reserves for Australia and the United States were revised based on new information from Government and industry sources.

	Mine production		Reserves[6]
	2016	2017[e]	
United States	W	W	35,000
Argentina	5,800	5,500	2,000,000
Australia	14,000	18,700	[7]2,700,000
Brazil	200	200	48,000
Chile	14,300	14,100	7,500,000
China	2,300	3,000	3,200,000
Portugal	400	400	60,000
Zimbabwe	1,000	1,000	23,000
World total (rounded)	[8]38,000	[8]43,000	16,000,000

World Resources: Owing to continuing exploration, lithium resources have increased substantially worldwide and total more than 53 million tons. Identified lithium resources in the United States, from continental brines, geothermal brines, hectorite, oilfield brines, and pegmatites, have been revised to 6.8 million tons. Identified lithium resources in other countries have been revised to approximately 47 million tons. Identified lithium resources in Argentina are 9.8 million tons; Bolivia, 9 million tons; Chile, 8.4 million tons; China, 7 million tons; Australia, 5 million tons; Canada, 1.9 million tons; Congo (Kinshasa), Russia, and Serbia, 1 million tons each; Czechia, 840,000 tons; Zimbabwe, 500,000 tons; Spain, 400,000 tons; Mali, 200,000 tons; Brazil and Mexico, 180,000 tons each; Portugal, 100,000 tons; and Austria, 50,000 tons.

Substitutes: Substitution for lithium compounds is possible in batteries, ceramics, greases, and manufactured glass. Examples are calcium, magnesium, mercury, and zinc as anode material in primary batteries; calcium and aluminum soaps as substitutes for stearates in greases; and sodic and potassic fluxes in ceramics and glass manufacture.

[e]Estimated. W Withheld to avoid disclosing company proprietary data. — Zero.
[1]Source: Rockwood Holdings, Inc., 2014, 2013 annual report: Princeton, NJ, Rockwood Holdings, Inc., p. 16.
[2]Defined as production + imports – exports. Rounded to one significant digit to avoid disclosing company proprietary data.
[3]Source: Industrial Minerals, IM prices: Lithium carbonate, large contracts, delivered continental United States.
[4]Defined as imports – exports + adjustments for Government and industry stock changes.
[5]See Appendix B for definitions.
[6]See Appendix C for resource and reserve definitions and information concerning data sources.
[7]For Australia, Joint Ore Reserves Committee-compliant reserves were about 1.4 million tons
[8]Excludes U.S. production.

2011-2018

Carson City
8/17/2012-Tour in Yerington
12/11/2014
5/19/2016
11/1/2016
11/30/2017-ACG Materials
02/20/2018

Elko
08/29/2014-Newmont LeeVille Mine
08/27/2015-Noble Energy's Huntington
K1L Well & General Molly Mt. Hope

Reno
4/29/2011
7/27/2011 – Tour of Bat Cupola in VC
11/2/2011
5/03/2012- Virginia City
11/09/2012
5/03/2013- Hazen and Olinghouse
10/10/2013
05/09/2014- EP Minerals; Nevada Cement Plant and Mine.
05/01/2015
11/05/2015-Bishop Manogue H.S.
05/04/2017-Tour of Tesla

Las Vegas
School of Mines - Henderson
2/07/2011 – Tour of Molycorp Mine
2/27/2012 – Searchlight Area
2/21/2013
2/14/2014- Tule Springs Park
2/24/2015
2/03/2016- Simplot Silica
3/02/2017
5/17/2018- Arden Mine

Battle Mountain
July 30, 2010 – Tour of Newmont Phoenix Mine

Tonopah
8/15/2013 - Solar Reserve Plant
8/16/2013 - Tonopah Mining Park
8/25/2017 – Mineral Ridge Mine and Uranium Resources Inc.

Wendover
8/25/2016- Graymont's Pilot Peak, Newmont Long Canyon Mine

Eureka
8/23/2018-McEwan Mining's Gold Bar Mine