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ENVIRONMENTAL RESTORATION
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(Page 1 of 2)

DATE RECEIVED: 9/28/92 PROCESSOR: YCG

ER-200-10-10-10

Part I: Complete all fields; indicate if not applicable or appropriate; please write legibly.

DOCUMENT ID: _____ DOCUMENT DATE: _____

ORIGINATOR NAME: R. L. Smith ORGANIZATION: US Geological

SYMBOL: 1-57 PAGE COUNT: _____

SUBJECT/TITLE: Geologic Map of the Jemez
Mountains, New Mexico

RECORD TYPE (Circle relevant type for primary record; type of attachments should be selected on *Keywords List*):

Analytical Data
Chain-of-Custody
Computer Output
Contract
Controlled Distribution
Drawing

FAX
Figure
Form
Interview
Letter
Logbook

Map
Memo
Microform
Notebook
Personal Notes
Photo

Plan
Procedure
Purchase Request
Receipt/Acknowledgment
Report
Review

Study
Telephone Record
Transcription
Video
Work Plan
Other Excerpt

RECORD CATEGORY: P
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TECH AREA(S)

ADS NO(S)

WBS NO(S)

STRUCTURE NO(S)/MDA

LIST RELEVANT TECH AREAS.

LIST RELEVANT ADS NO(S).

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LIST RELEVANT STRUCTURE NO(S)/MDA.



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DOCUMENT TO

LIST MULTIPLE RECIPIENTS.

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ORIGINATOR NAMES

LIST MULTIPLE ORIGINATORS.

R. A. Bailey
C. S. Ross

CORRECTION (Y/N): _____

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025097531

KEYWORDS: Circle relevant KEYWORDS from the list below for ER Record #: 9752

MISCELLANEOUS (List other indexing criteria as necessary; please write legibly): Jemez Mountains, Map I-571

Abandon	Burn	Contaminant	ERDA (Energy Research and Development Administration)	Glove Box
Aboveground Tank	Burn Site	Contract	Erosion	Graph
Absorption	-----	Control	Error	Guidance
Abstract	Cadmium	Controlled Distribution	ES&H (Environment, Safety, and Health)	Gun
Accelerator	Calsson	Core	Estimate	-----
Access	Calibration	Corrective Action	Evacuation	Handling
Accident	Canyon	Correspondance	Evaluation	Hazardous
Accumulation	Capacitor	Criteria	Evaporator	Health
Acid	Caustic	Cyanide	Excavation	HE (High Explosive)
Active	CEARP (Comprehensive Environmental Assessment and Response Program)	-----	Exclusion	History
Administrative	Cement	Data	Exhaust	Hole
ADS (Activity Data Sheet)	CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act)	Deadline	Experiment	Home Owner
Adsorption	-----	Debris	Explosive	Hood
AEC (Atomic Energy Commission)	Cesium	Decision Analysis	Exposure	HSWA (Hazardous and Solid Waste Amendments)
Aerial	Chain of Custody	Decommission	Extension	Hydrology
Agenda	Chamber	Decontamination	Extraction	Hygiene
Agreement	Change Control	Deficiency	-----	-----
Air	Change Order	Deliverable	Facility	Impact
Alpha	Charge	Demolition	Fallout	Implementation
Americium	Chart	Description	Farm	Implosion
Analysis	Checklist	Detonation	FAX	Impoundment
Analytical	Chemical	Development	Fence	Inactive
AOC (Area of Concern)	Chromium	Discharge	Field	Incident
Approval	Cleanup	Disposal	Figure	Incinerator
Aquifer	Clearance	Documentation	Filter	Industrial
ARAR (Applicable, Relevant, or Appropriate Requirements)	Closure	DOE (Department of Energy)	FIMAD (Facility for Information Management, Analysis, and Display)	Infiltration
Archaeology	Clothing	Dose	Finding	Injection Well
Archive	CM/RA (Corrective Measures Implementation/Remedial Action)	DQO (Data Quality Objectives)	Fire	Injury
Area	CMS/FS (Corrective Measures Study/Fesibility Study)	Draft	Firing Site	Inorganic
Arsenic	Cobalt	Drainage	Fiscal	Inspection
Asbestos	Comment	Drainline	Fission	Installation
Asphalt	Committee	Drawing	Five-Year Plan	Interim
Assessment	Community Relations	Drilling	Flow	Interim Action
Audit	Compliance	Drop Tower	Flow chart	Interview
-----	Compressed Gas	Drum	Fluid	Inventory
Backfill	Computer Modeling	Dry Well	Form	Investigation
Bacteria	Computer Output	Dump	Framework	IRM (Interim Remedial Measure)
Barium	Concern	Duplicates	Free	Isotope
Baseline	Concrete	-----	Fuel	IWP (Installation Work Plan)
BCP (Baseline Change Proposal)	Concurrence	Ecology	Fume	-----
Beds	Configuration	Effluent	-----	Lab Job
Barred Area	Construction	EIS (Environmental Impact Statement)	Gamma	Laboratory
Beryllium	Container	Emission	Gas	Lagoon
Beta	Containment	Engineering	Generation	Land
Biology	-----	Environmental	Generic	Landfill
Blank		EPA (Environmental Protection Agency)	Geochemistry	Laundry
Boller		Equipment	Geology	Leach
Boneyard			Geophysics	Lead
Bunker			Glass Beaker	Leak
Buried				Legal

Letter	Observation	Quality	Scrap	Technical
Limit	Off-gas	QA (Quality Assurance)	Scrap Detonation Site	Technical Team
Lines	Oil	QP (Quality Procedure)	Screening	Technology
Liquid	Open	Quarterly Report	Scrubber	Telephone Record
List	Open Burning	Radioactive	Search	Test Area
Log	Operation	Radiochemistry	Security	Testing
Logbook	Order	Radionuclide	Seep	TLD (Thermoluminescent Dosimeter)
Magazine	Organic	Radium	Seminar	TOC (Table of Contents)
Management	Organization	Rationale	Semivolatile	Townsite
Manhole	OSHA (Occupational Safety & Health Administration)	RCRA (Resource, Conservation, and Recovery Act)	Septic	Toxic
Map	OU (Operable Unit)	Reactor	Sewer	Tracking
Material	Outfall	Receipt	Shaft	Training
MDA (Material Disposal Area)	Outline	Acknowledgment	Sheet	Transcription
Media	Pad	Recommendation	Shell	Transfer
Meeting	PA/RFA (Preliminary Assessment /RCRA Facility Assessment)	Reconnaissance	Silver	Transformer
Memo	PCB (Polychlorinated Biphenyl)	Records	Site	Transport
Mercury	Permit	Recovery	Sludge	Treatment
Metal	Personal Notes	Recycle	Soil	Trench
Microform	Personnel	Reduction	Solid	Trip Report
Minimization	Personnel Qualification	Reference	Solvent	Tritium
Minutes	Photo	Regulation	SOP (Standard Operating Procedure)	TRU (Transuranic)
MIS (Management Information System)	Pilot Study	Release	SOW (Statement of Scope of Work)	TSCA (Toxic Substances Control Act)
Mixed Waste	Pipe	Remediation	Specific	Tuballoy
MOA (Memo of Agreement)	Pit	Removal	Spill	Tuff
Model	Plan	Report	Stack	Underground
Modification	Plant	Request	Standard	Uranium
Money (Allocation, Appropriation, Budget, Cost, Funding, etc.)	Plutonium	Requirements	Statistics	Urine
Monitoring	Pollution	Research	Steamline	USGS (United States Geological Survey)
Monthly Report	Polonium	Resin Bed	Steel	UST (Underground Storage Tank)
Mortar Impact Area	Polaroid	Resolution	Storage	Utility
MOU (Memo of Understanding)	Potential	Resource	Strontium	Validation
MSA (Major System Acquisition)	Presentation	Respirator	Structure	Variance
NEPA (National Environmental Policy Act)	Prevention	Response	Study	VE (Value Engineering)
NFA (No Further Action)	Priority	Restoration	Subcontractor	Ventilation
Nitrate	Procedure	Restriction	Subsurface	Verification
NMED (New Mexico Environment Department)	Program	Results	Summary	Video
NMEID (New Mexico Environmental Improvement Division)	Programmatic	Review	Sump	Volatile
NOD (Notice of Deficiency)	Project	Revision	Support	Volume
Nonexplosive	Project Leader	RFI/RI (RCRA Facility Investigation/Remedial Investigation)	Surface	Warehouse
Notebook	Propellant	Risk	Surveillance	Waste
Notification	Property	RPF (Records-Processing Facility)	Survey	Water
NPDES (National Pollutant Discharge Elimination System)	Proposal	Safety	Swipe	WBS (Work Breakdown Structure)
NRC (Nuclear Regulatory Commission)	Protection	Salamander	SWMU (Solid Waste Management Unit)	Weapon
Nuclear	Protocol	Salvage	System	Well
	PRS (Potential Release Site)	Sample	Table	Work
	Public	Sampling Plan	Tank	Working Group
	Pump	Sanitary	Task	Zinc
	Purchase Request	Satellite	TCLP (Toxicity Characteristic Leaching Procedure)	
		Schedule	TDD (Technical Document Description)	
		Scope		

02-005-

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

①

GEOLOGIC MAP OF THE JEMEZ MOUNTAINS,
NEW MEXICO

By
R. L. Smith, R. A. Bailey, and C. S. Ross

MISCELLANEOUS GEOLOGIC INVESTIGATIONS
MAP I-571



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1970

DESCRIPTION OF CENOZOIC MAP UNITS

- 01 ALLUVIUM (0-1000 ft)—silt, sand, and gravel; mainly deposits of recent streams with steep gradients.
- 02 PAN DE AZÚCAR (0-1000 ft)—coarse sand and gravel; mainly deposits of recent streams with steep gradients.
- 03 LANDSLIDE DEPOSITS (0-1000 ft).
- 04 TUFFACIOUS LAKE SEDIMENTS (0-100 ft)—thin-bedded clay, silt, and sand deposited in lakes within the Valle Caldera; commonly contain fossil leaf and other plant remains; interbedded with tuffs of the Valle Grande Member of the Valle Rhyolite.
- 05 TERRACE GRAVELS—terrace gravels of the Chama River and Rio Grande and their tributaries, mainly north of White Rock Canyon. Well-sorted pebbles, cobbles, and boulders of Precambrian quartzite, crystalline rocks, and subordinate volcanic rocks.
- 06 VALLES RHYOLITE
- 06a BANCOS BONITO MEMBER (100-500 ft)—thick flow of porphyritic obsidian containing phenocrysts of quartz, sanidine, plagioclase, biotite, hornblende, and pyroxene.
- 06b EL CAJETE MEMBER (0-200 ft)—well-bedded to cross-bedded air-fall deposits consisting of blocks and lapilli of rhyolite pumice containing phenocrysts of quartz, sanidine, plagioclase, biotite, hornblende, and pyroxene.
- 06c BATTLESHIP ROCK MEMBER (0-400 ft)—non-welded to partly welded ash-flow deposit, composed of rhyolite ash, and pumice lapilli and blocks containing quartz, sanidine, plagioclase, hornblende, and pyroxene phenocrysts; a valley deposit confined to uppermost Canon de San Diego.
- 06d VALLE GRANDE MEMBER
- 06d1 Volcanic domes and flows (200-2,500 ft)—predominantly porphyritic rhyolites containing major phenocrysts of quartz and sanidine with lesser plagioclase, biotite, hornblende, and pyroxene.
- 06d2 Rhyolite tuffs (0-500 ft).
- 06d3 RECONOCER CREEK MEMBER
- 06d31 Rhyolite dome, dikes, flows, and interlayered tuffs (0-500 ft) characterized by lack of quartz and by phenocrysts of plagioclase mantled by sanidine; also contains biotite and pyroxene phenocrysts.
- 06d32 DEER CANYON MEMBER
- 06d321 Rhyolite dome-flow, associated breccias, and bedded tuffs (25-100 ft). Predominantly coarsely porphyritic lithoid rhyolite typically containing abundant phenocrysts of sanidine and bi-pyramidal quartz.
- 06d322 CALDERA FILL (0-2,500+ ft)—coarse breccia, gravel, sand and silt deposited within the Valle Caldera. Predominantly volcanic detritus but locally contains large blocks of Paleozoic limestone and red sandstone. Some coarse breccia units represent landslide deposits from the caldera walls. Includes early-formed caldera lake sediments and some pyroclastic tuffs.
- 06d323 CERRO NEBIO QUARTZ LENTITE
- 06d3231 Shallow intrusion of medium to light-gray biotite-hornblende quartz lentite.
- 06d3232 Volcanic dome of red to gray biotite-hornblende quartz lentite.
- 06d3233 CERRO NEBIO RHYOLITE
- 06d32331 Volcanic dome; mainly gray lithoid rhyolite, commonly lithopur, and subordinate obsidian, containing small sanidine and rare quartz phenocrysts.
- 06d32332 Rhyolite tuffs and tuff breccias (0-20+ ft); includes hot sandstone deposits from the Babito Mountain center.
- 06d32333 RANDELER TUFF (30-500+ ft)
- 06d323331 Predominantly non-welded to densely welded ash-flow deposits consisting of rhyolite ash and pumice, typically containing bi-pyramidal quartz and chatoyant sanidine phenocrysts.
- 06d323332 THIRSIER MEMBER (50-500+ ft)—non-welded to densely welded ash-flow deposits, characteristically containing sparse to abundant (concentric) inclusions of hornblende-rich quartz-lattice pumice, and sparse accidental lithic inclusions. As mapped includes 1-12 ft of basal, bedded, air-fall pumice (Franklin Pumice Bed).
- 06d323333 OTTOY MEMBER (0-800+ ft)—non-welded to densely welded ash-flow deposits, characteristically containing abundant accidental lithic inclusions. As mapped includes 0-20 ft of basal, bedded, air-fall pumice (Grays Pumice Bed).
- 06d323334 EL RECIERLOS RHYOLITE—volcanic domes and a single small pumice cone. Pumice, perlitic, and obsidian containing fine, small quartz and sanidine phenocrysts.
- 06d323335 RIVER GRAVELS (0-200 ft)—gravel of the Rio Grande and Chama Rivers and locally of their tributaries. Well-sorted pebbles, cobbles, and boulders mainly of Precambrian quartzite and crystalline rocks, but containing minor volcanic rocks. Interbedded with pediment gravel (QTg). Pays Formation, and basalt of Santa Ana Mesa and White Rock Canyon and old alluvium (Q1).
- 06d323336 BASALTIC ANTEPOST OF TANK NINETEEN (0-2000 ft)—basaltic andesite lavas forming a broad hummocky shield in the western Cerros del Rio. Overlies Ottoy Member of Banderler Tuff and Cerro Toledo Rhyolite tuffs in lower White Rock Canyon.
- 06d323337 BASALTIC LAVAS AND TUFFS OF CERROS DEL RIO, SANTA ANA MESA, AND EL ALTO
- 06d3233371 Santa Ana Mesa. Predominantly olivine-angite basalt flows and associated scattered vent pyroclastics (0-1000 ft). Cerros del Rio. Mainly basaltic andesite flows and tuffs (0-1500 ft) commonly containing quartz xenocrysts. As mapped includes hornblende andesite of Teñilla Peak, Cerro Fortillo, and Orta Mountain (Pansky Peak).
- 06d3233372 El Alto. Olivine-angite basalt flows and cinders (0-200 ft); commonly containing quartz xenocrysts.
- 06d3233373 PUYE FORMATION (50-700 ft)—conglomerate and coarse sand with numerous interlayered lithic lapilli tuff beds and lahar (mud flow) deposits. Composed predominantly of dacite, rhyolite, and quartz lentite debris derived from contemporaneous erosion and volcanism of the Toluca Formation. The basal Tuff (Lent) (0-80 ft), not separately mapped, consists of well-sorted boulders and cobbles of Precambrian quartzite and crystalline rocks, probably channel gravels of the ancestral Rio Grande. As mapped in the vicinity of Totol, the upper part of Puye includes 1-30 ft of interbedded lake clay and basaltic ash.

- 07a OLD ALLUVIUM (thickness unknown)—predominantly volcanic sand and gravel accumulated locally between St. Peter's Dome and the Rio Grande. In part interbedded with river gravels (QTg) of the Rio Grande. Probably time equivalent to Puye Formation.
- 07b FERMENT GRAVEL (50-100 ft)—weakly cemented gravel consisting entirely of volcanic rock types; derived from pedimentation of the Keres Group and the Cochiti Formation.
- 07c TICHOMOA FORMATION (0-2,000 ft)—predominantly coarsely porphyritic dacite, rhyolite, and quartz lentite containing pyroxene, hornblende, biotite, plagioclase, and occasionally quartz phenocrysts. Thick massive flows and domes. Associated pyroclastics mapped as part of the Puye Formation.
- 07d LORAYO BASALT (0-600 ft)—olivine-angite and titaniferous augite basalt, commonly containing xenocrystic quartz; predominantly flows.
- 07e BEARHEAD RHYOLITE (0-2,000+ ft)—vitric to lithoid rhyolite containing conspicuous phenocrysts of quartz, sanidine, and biotite.
- 07f Volcanic domes and shallow intrusions.
- 07g Predominantly thick lava flows.
- 07h PERALTA TUFF MEMBER (0-2,000 ft)—bedded rhyolite tuffs and tuff breccias, locally stream-worked.
- 07i PALAZA CANYON FORMATION
- 07i1 Coarsely porphyritic dacite, rhyolite, and quartz lentite containing pyroxene, hornblende, biotite, and occasionally quartz phenocrysts. Mainly thick massive flows and dome flows (0-800 ft).
- 07i2 Mainly hypersthene-angite andesites and subordinate olivine-bearing basaltic andesites. Flows, flow breccias, tuff breccias, and dikes, undivided (0-2,000+ ft). All mapped includes some gravels of the Cochiti Formation.
- 07i3 Predominantly olivine-angite basalt flows (0-200 ft).
- 07j COCHITI FORMATION (0-1,500 ft)—poorly consolidated gravel and sand composed predominantly of volcanic detritus derived from the Keres Group. As mapped locally includes some interlayered beds of Peralta Tuff Member of the Bearhead Rhyolite. The facies beneath Santa Ana Mesa contains increasingly more abundant granitic detritus southward.
- 07k CANONAS CANYON RHYOLITE (0-800 ft)—vitric to lithoid rhyolite generally containing no or very few tiny phenocrysts. Bearhead Dome and the uppermost flow in the Bear Springs area contain conspicuous quartz, sanidine, and quartz phenocrysts.
- 07l Volcanic domes and shallow intrusions.
- 07m Flows and bedded tuffs undivided (0-150 ft). As mapped in the Borrego Mesa area includes lower part of Cochiti Formation.
- 07n BASALT OF CHAMA MESA (0-150 ft)—olivine basalt. This multiple flows.
- 07o SANTA FE FORMATION AS USED BY H. T. U. SMITH (1938), DENNY (1938), AND CALDERA (1960) (0-5,000+ ft). Poorly consolidated buff, red, or gray arkosic sand, silt, clay, and pebble beds, with minor, thin, white or green ash beds. As mapped east of the Rio Grande, include Ancha and Tesqueño(?) Formations of Spiegel and Babito (1932).
- 07p Interbedded basalt flows (0-50 ft).
- 07q ABOQUO TUFF OF SMITH (1938) (0-1,200+ ft)—mainly white to light-gray tuffaceous sand and conglomerate; includes basal gravel member (0-300 ft), composed of Precambrian crystalline rock types, and a thin (5-20 ft) chert bed (Palmer Chert Member of Church and Hawk, 1932). The Abiquo west of La Grulla Plateau consists only of the basal gravel and chert. Includes tuffaceous sediments of questionable correlation at the mouth of Santa Fe Creek Canyon.
- 07r ZIA SAND FORMATION OF CALDERA (1960) (1,000+ ft)—poorly consolidated, predominantly light gray to reddish, greenish, and pinkish-gray arkosic sands, locally consolidated and containing calcareous ledges and silted fish ash in the upper part.
- 07s VOLCANIC AND INTRUSIVE ROCKS OF THE BLAND DISTRICT UNDIVIDED
- 07s1 Basaltic, andesitic, and dacitic flows and tuff breccias intruded by small stocks, dikes, and sills of granodiorite pervasively chloritized and locally mineralized. Thick and unknown.
- 07s2 ESPINAZO VOLCANES OF STEARNS (1934) (2,000+ ft)—lithic tuffs, tuff breccias, and flows from centers in the Cerros Hills and Orta Mountain, southeast of the map area.
- 07s3 EL RITO FORMATION OF SMITH (1938) (0-400 ft)—red to gray sandstone, conglomerate, and shale.
- 07s4 GALILEO FORMATION (0-2,000+ ft)—red and tan to variegated shale, siltstone, sandstone and conglomerate. In the St. Peter's Dome area, includes overlying volcanic debris resembling the Espinazo Volcanes of Stearns (1934).

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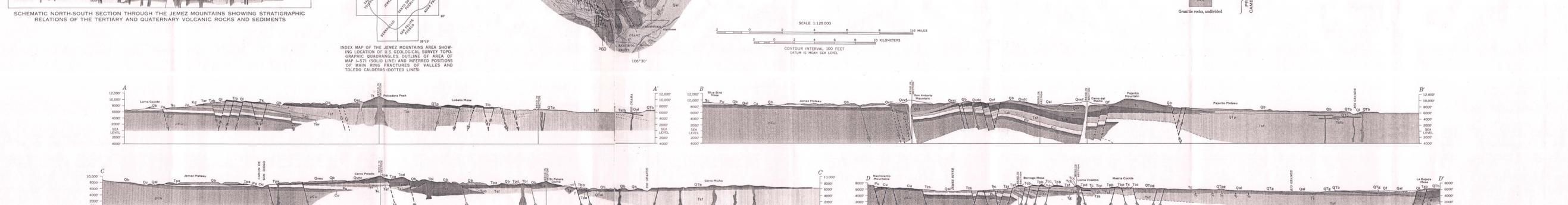
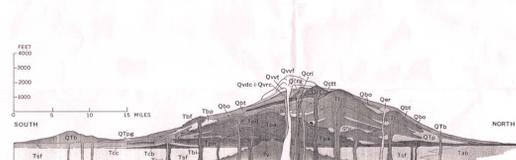
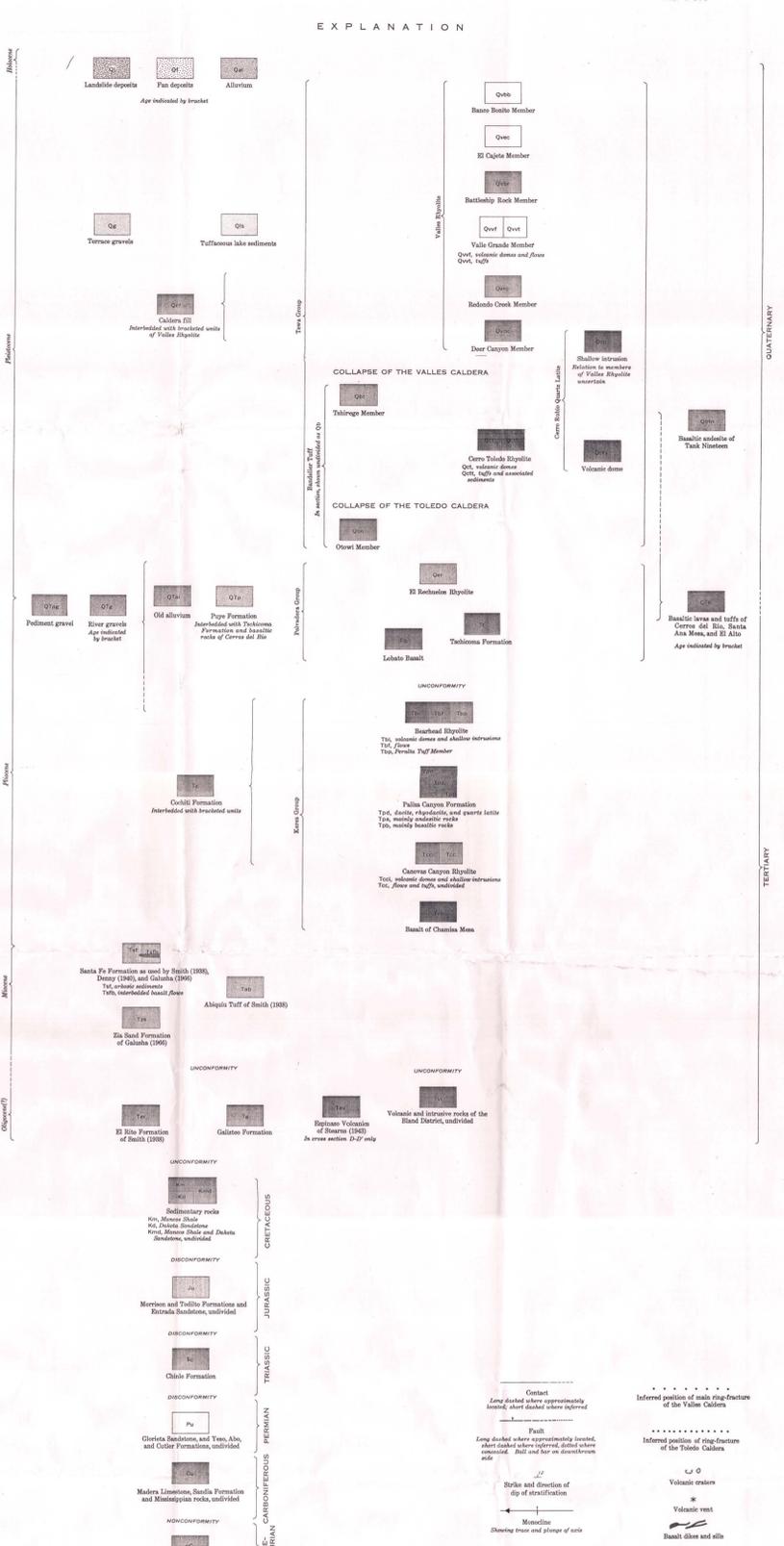
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