CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ORDER NO. 86-84

WASTE DISCHARGE REQUIREMENTS
FOR
IMPERIAL MAGMA
GEOTHERMAL DEVELOPMENT WELLS
SALTON SEA KNOWN GEOTHERMAL RESOURCE AREA (KGRA)
Imperial County

The California Regional Water Quality Control Board, Colorado River Basin Region, finds that:

1. Imperial Magma (hereinafter also referred to as the discharger), P.O. Box 17760, Los Angeles, California, 90017, submitted an updated Report of Waste Discharge, dated August 8, 1986.

2. The discharger has presently drilled 18 geothermal exploratory and production wells in the Salton Sea KGRA. Most of these wells supply geothermal fluid to the Vulcan Power Plant (a 40 MW (Gross) electric power generating plant owned and operated by Magma Power Company). These wells have been drilled at the following locations:

Elmore Unit Development

Baretta #1	SE¼, NE¼ of Section 34, T11S, R13E, SBB&M
Elmore #2	SW¼, SW¼ of Section 26, T11S, R13E, SBB&M
Elmore #4	NW¼, SW¼, SE¼ of Section 26 T11S, R13E, SBB&M

Del Ranch Unit Development
(Section 33, T11S, R13E, SBB&M)

Well		Well	
M-2	NW¼, NW¼, SW¼	M-10	SW¼, SW¼, SE¼
M-3	NE¼, NE¼, SW¼	M-11	SW¼, SW¼, SE¼
M-5	SE¼, SE¼, SW¼	M-12	SE¼, SW¼, SE¼
M-6	SE¼, SE¼, SW¼	M-13	SW¼, SW¼, SE¼
M-7	SE¼, SE¼, SW¼	M-14	SW¼, SW¼, SE¼
M-8	SW¼, SW¼, SW¼	M-15	SE¼, SW¼, SE¼
M-9	SE¼, SE¼, SW¼	M-16	SE¼, SE¼, SE¼

Woolsey # 1 SE¼, SE¼ SE¼

3. The discharger proposes to drill 12 additional wells, nine (9) of which are at the following locations:

1-20-91 Superseded w/Board Order No. 91-05

Elmore Unit Development

Elmore #5	NW¼,	SW¼, SE¼,	of Section	26, T11S, R13E, SBB&M
Elmore #6	NW¼,	SW¼, SE¼	of Section	26, T11S, R13E, SBB&M
Elmore #8	NW¼,	NW¼, SW¼,	of Section	26, T11S, R13E, SBB&M
Wiest #2	NE¼,	NE¼, NE¼,	of Section	35, T11S, R13E, SBB&M
Wiest # 3	SW¼,	SW¼, NE¼	of Section	35, T11S, R13E, SBB&M

River Ranch Unit Development

RR-2	SE¼,	SE¼, SW¼	of Section	25, T11S, R13E, SBB&M
RR-3	NE¼,	NE¼, SE¼	of Section	25, T11S, R13E, SBB&M
RR-4	NE¼,	NE¼, SW¼	of Section	25, T11S, R13E, SBB&M
RR-5	NW¼,	NW¼, NW¼	of Section	25, T11S, R13E, SBB&M

4. The discharger has presently drilled seven (7) injection wells at the following locations:

IW-1	NE¼,	SE¼, NW¼	of Section	34, T11S, R13E, SBB&M
IW-2	SE¼,	NE¼, NW¼	of Section	34, T11S, R13E, SBB&M
IW-3	SE¼,	NE¼, NW¼	of Section	34, T11S, R13E, SBB&M
IW-4	NW¼,	NE¼, NW¼	of Section	34, T11S, R13E, SBB&M
IW-5	SE¼,	SE¼, SE¼	of Section	33, T11S, R13E, SBB&M
IW-6	NW¼,	NE¼, NW¼	of Section	34, T11S, R13E, SBB&M
IW-7	NE¼.	NW¼, NW¼	of Section	34, T11S, R13E, SBB&M

5. A temporary containment basin, capable of containing the maximum expected discharge of drilling mud, cuttings, cleanout fluid, and geothermal test fluid including a two (2) foot freeboard would be constructed at each well site.

6. The discharger proposes to discharge into each temporary containment basin a maximum of 140,000 gallons of geothermal waste. Final disposal would be by subsurface injection or after some evaporation, the residual fluid and solids would be discharged at a Class I or Class II waste disposal facility approved by the Regional Board to receive said wastes.

7. Flow from production testing of geothermal wells would be injected subsurface.

8. Geothermal fluids in this portion of the Salton Sea KGRA are known to have a total dissolved solids (TDS) concentration range of 214,000 mg/l ± 98,000.

9. The Water Quality Control Plan for the Colorado River Basin Region of California was adopted by the Regional Board on November 14, 1984.

10. Beneficial uses to be protected by this Order are as follows:

    A. Ground Water

        1. Shallow ground waters at the discharge location are saline and are not beneficially used.
        2. Deep ground waters are brine and are being investigated for geothermal development.

    B. New and Alamo Rivers and Imperial Valley Irrigation Drains

        1. Freshwater replenishment for Salton Sea.
        2. Freshwater habitat for fish and wildlife.
        3. Recreation - nonwater contact.

11. Imperial County Planning Department adopted in November, 1980 Environmental Impact Report SCH#79072515 for a proposed power plant and for geothermal well development. The report indicates that this project would not have any significant adverse effects on water quality.

12. These geothermal development wells have been subject to waste discharge requirements adopted in Board Orders No. 80-9, 81-39, and 84-109.

13. The Board has notified the discharger and interested agencies and persons of its intent to update waste discharge requirements for these development wells.

14. The Board in a public meeting heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, Imperial Magma shall comply with the following:

A. Discharge Specifications

1. Neither the treatment nor the discharge of wastes shall create a pollution or a nuisance as defined in Division 7 of the California Water Code.

2. Geothermal cleanout fluid and geothermal test fluid shall be injected subsurface or discharged for temporary storage into either:

    (a) Earthen basins with a minimum six (6) inch compacted clay lining having a coefficient of permeability of 1×10^{-6} cm/sec or less. Clay lining shall be defined as: at least 30 percent of the material, by weight, passing a No. 200 U.S. Standard Sieve; or

    (b) Earthen basins lined with a synthetic liner of not less than 40 mil thickness; or

    (c) Metal or other type containers approved by the Executive Officer.

    All such basins or containers shall be protected and maintained to ensure their effectiveness.

3. A minimum freeboard of at least two (2) feet shall be maintained at each temporary containment basin.

4. Fluid discharged by subsurface injection shall not be injected into any subsurface aquifer which has a TDS concentration of less than 10,000 mg/l, unless the TDS concentration of the injection water is less than or equal to that of the receiving water,or, as an alternative, the discharger demonstrates to the satisfaction of the Regional Board that injection into said zone will not pose a threat to water quality.

5. Fluids discharged by subsurface injection shall be injected below the fracture pressure of the receiving aquifer or of the confining layer immediately above the receiving aquifer.

6. Geothermal waste with extractable water containing a TDS concentration exceeding 6,000 mg/l shall be discharged at a Class I or Class II waste management facility approved by the Regional Board to receive such waste.

7. Geothermal waste with extractable water containing a TDS concentration less than 6,000 mg/l, and not containing hazardous constituents as defined in Article 11, Title 22 of the California Administrative Code and future editions, shall be discharged at a waste management facility approved by the Regional Board to receive such waste.

8. Final disposal of residual wastes and cleanup of containment facilities shall be accomplished upon abandonment or closure of operations to the satisfaction of the Executive Officer. Lack of construction or operational activity on site for a period of one year shall constitute abandonment for the purposes of this Order.

B. Provisions

1. The discharger shall comply with the "Monitoring and Reporting Program No. 86-84" and future revisions thereto, as specified by the Executive Officer.

2. Permanent (longer than one (1) year) disposal or storage of geothermal waste to on-site temporary containment basins is prohibited.

3. The discharger shall submit to the Board, at least 30 days prior to commencement of operation at each new well, a written report on the proposed method and estimated costs of cleanup and closure in accordance with the requirements of this Order.

4. At least ten days prior to the discharge of any material into a temporary containment basin, the discharger shall submit to the Regional Board a report signed by a California Registered Civil Engineer advising the Executive Officer that the temporary containment basin and attendant facilities are constructed to meet the requirements of this Order.

5. Prior to any change of ownership of these operations, the discharger shall transmit a copy of this Order to the succeeding owner/operator, and forward a copy of the transmittal letter to this Board.

6. This Order does not authorize violation of any federal, state, or local laws or regulations.

7. This Order supersedes Board Orders No. 80-9, 81-39, and 84-109.

I, Arthur Swajian, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, Colorado River Basin Region, on November 19, 1986.

Arthur Swajian
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

MONITORING AND REPORTING PROGRAM NO. 86-84
FOR
IMPERIAL MAGMA
GEOTHERMAL DEVELOPMENT WELLS
SALTON SEA KNOWN GEOTHERMAL RESOURCE AREA (KGRA)
Imperial County

Location: Sections 25, 26, 33, 34, and 35, T11S, R13E, SBB&M

MONITORING

Imperial Magma shall report monitoring data to the Regional Board in accordance with the following schedule:

1. The discharger shall submit to the Board, at least 30 days prior to commencement of operation at each new well, a written report on the proposed method and estimated costs of cleanup and closure in accordance with the requirements of this Order.

2. At least ten days prior to the discharge of any material into a temporary containment basin, the discharger shall submit to the Regional Board a report signed by a California Registered Civil Engineer advising the Executive Officer that the temporary containment basin and attendant facilities are constructed to meet the requirements of this Order.

3. The discharger shall submit the following information:

Constituents	Unit	Reporting Frequency
(a) Volume of discharge contained in each temporary containment basin.	Gallons	Monthly
(b) Volume of geothermal waste containing greater than 6,000 mg/l TDS concentration discharged at Class I or Class II waste management facility, and name of facility.	Gallons	Monthly

Constituents	Unit	Reporting Frequency
(c) Volume and TDS concentration of geothermal waste containing less than 6,000 mg/l TDS discharged at a waste management facility approved by the Regional Board, and name of facility	Gallons and mg/l	Monthly
(d) Total dissolved solids concentration of fluid waste injected into each injection well	mg/l	Quarterly
(e) Total dissolved solids concentration of ground water contained in strata proposed to receive fluid waste injection.	mg/l	At least ten days prior to commencement of injection

4. During well drilling operations a representative sample of drilling mud shall be analyzed for halogenated solvents and results reported to the Regional Board within 15 days. If drilling muds are found to contain halogenated solvents, they cannot be discharged to on site temporary containment basins and must be discharged to a Class I waste management facility. Volume of drilling muds discharged and name of facility shall be forwarded to the Regional Board.

5. Immediate reporting of any accidental spillage or release of waste material, and immediate measures being taken to correct same and to limit detrimental effects.

6. Report of completion of removal of all geothermal waste from temporary storage basins within one (1) week following completion of work.

7. At least ten (10) days prior to destruction of each temporary storage basin, the discharger shall request a Regional Board staff inspection and approval of the cleanup procedures.

REPORTING

Except for Items 1 and 2, above, the above monitoring program shall be implemented immediately upon commencement of discharge at each site.

Monthly reports shall be submitted to the Regional Board by the 15th day of the following month. Quarterly reports shall be submitted to the Regional Board by January 15, April 15, July 15, and October 15 of each year. Reports for Item 5 (above) shall be forwarded immediately and shall be preceded by phone communication to the Regional Board's office. Phone No. (619) 346-7491. Copies of the reports submitted to the Board pursuant to this Monitoring and Reporting Program shall be maintained at the operations site, and shall also be made available to staff of the Regional Board upon request.

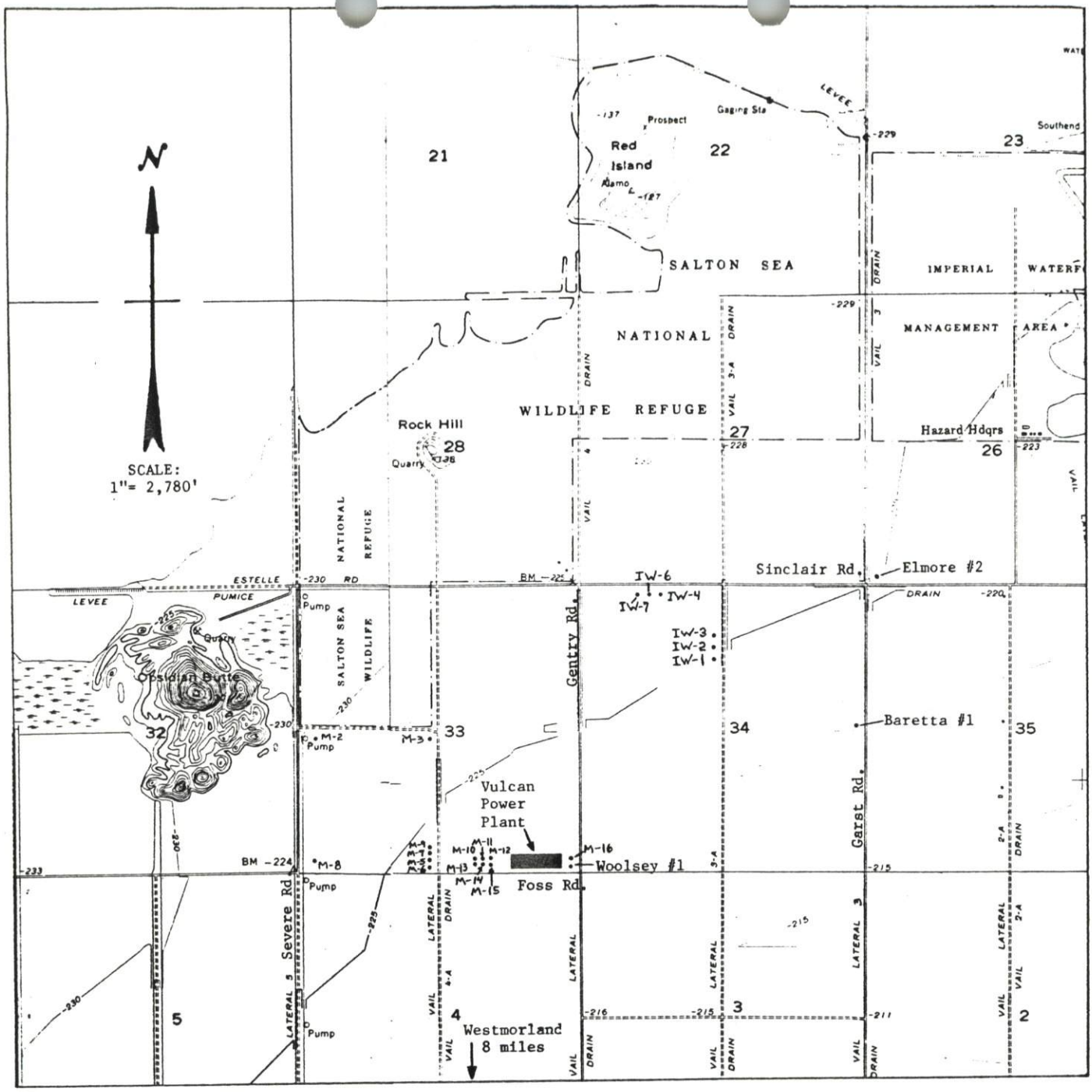
Mail reports to

California Regional Water Quality Control Board
Colorado River Basin Region
73-271 Highway 111, Suite 21
Palm Desert, CA 92260

ORDERED BY: Arthur Sevajian
Executive Officer

November 19, 1986
Date

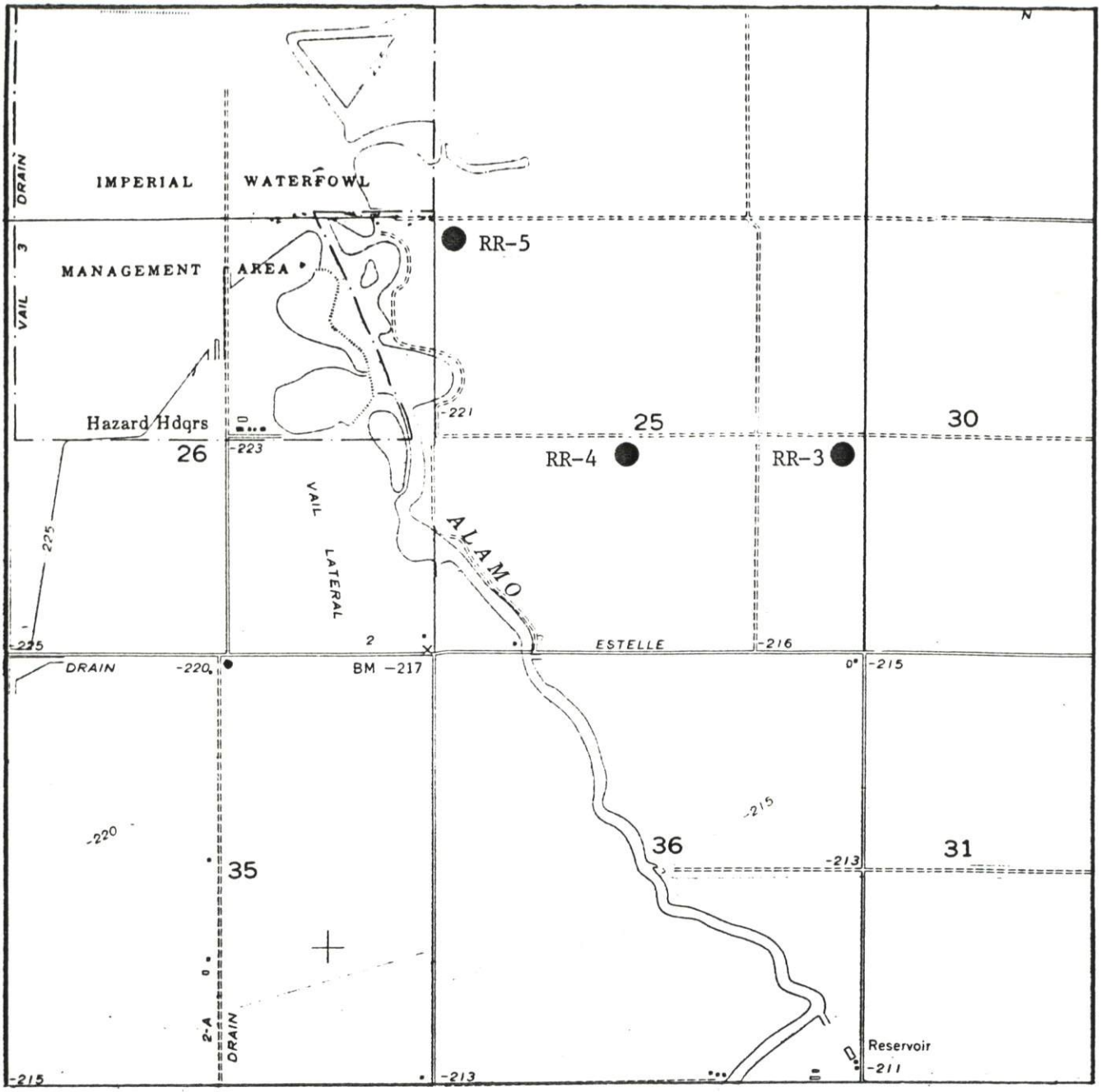
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD - 7
COLORADO RIVER BASIN REGION



SITE MAP NO. 1

IMPERIAL MAGMA
GEOTHERMAL DEVELOPMENT WELLS
SALTON SEA KNOWN GEOTHERMAL RESOURCE AREA (KGRA)
Imperial County
Sections 26, 27, 33, 34 and 35, T11S, R13E, SBB&M
Section 4, T12S, R13E, SBB&M
USGS Obsidian Butte and Niland 15 min. Topographic Map

Order No. 86-84



SITE MAP NO. 2

IMPERIAL MAGMA
GEOTHERMAL DEVELOPMENT WELLS
SALTON SEA KNOWN GEOTHERMAL RESOURCE AREA (KGRA)
Imperial County
Section 25, T11S, R13E, SBB&M
USGS Niland 15 min. Topographic Map

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