CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER No. 92-105

WASTE DISCHARGE REQUIREMENTS FOR:

Ridgemont Development, Inc.; Watt Residential, Inc. and Watt Industries/Oakland, Inc. dba Ridgemont Development, Inc.; Watt Industries/Oakland, Inc.; Watt Residential, Inc.; Watt Housing Corporation; Alcoa Construction Systems, Inc.; Challenge Developments, Inc.; AP Construction Systems, Inc.; F.M. Smith and Evelyn Ellis Smith; Realty Syndicate; and Aluminum Company of America

Leona Heights Sulfur Mine and Mining Waste Disposal Site
Oakland Hills, Alameda County

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board) finds that:

1. Ridgemont Development, Inc., and Watt Residential, Inc. and Watt Industries/Oakland, Inc. dba Ridgemont Development, Inc. are the current property owners of the Leona Heights Sulfur Mine and Mining Waste Disposal Site (hereinafter called the Site) located in the Oakland Hills near the junction of Interstate 580 and State Highway 13. Ridgemont Development Company submitted a Report of Waste Discharge (ROWD) on July 22, 1991 consisting of a Mine Closure and Post-Closure Maintenance Plan. The ROWD is hereby incorporated as part of this Order.

2. It appears that the Site was operated as a sulfur mine from approximately 1900 - 1929 by the Leona Chemical Company. The site at this time was owned by F.M. Smith and Evelyn Ellis Smith, and Realty Syndicate. Since cessation of mining activities, conditions at the site have changed very little. On November 1, 1984, Title 23, Subchapter 15 of the California Code of Regulations was adopted requiring all dischargers of abandoned mining sites to submit a ROWD in compliance to Article 7 of this subchapter. Consequently, the current site owner, all previous property owner site owners since November 1, 1984, and all owners from the period of mining activity, are responsible for proper closure and maintenance of the mined area. As such, RIDGEMONT DEVELOPMENT, INC.; WATT RESIDENTIAL, INC. AND WATT INDUSTRIES/OAKLAND, INC. dba RIDGEMONT DEVELOPMENT, INC.; WATT INDUSTRIES/OAKLAND, INC.; WATT RESIDENTIAL, INC.; WATT HOUSING CORPORATION; ALCOA CONSTRUCTION SYSTEMS, INC.; CHALLENGE DEVELOPMENTS, INC.; AP CONSTRUCTION SYSTEMS, INC.; F.M. SMITH AND EVELYN ELLIS SMITH; REALTY SYNDICATE; and ALUMINUM COMPANY OF AMERICA are hereinafter called the dischargers.

3. Sulfur-bearing ore was mined from this location and possibly used to manufacturer paint pigments and sulfuric acid. Sulfuric acid production is a fairly simple process most likely

done by crushing the ore, possibly heating it, and running water through it. The residual crushed ore is what remains at the Site and will be referred to as mine tailings. The presence of these mine tailings is what constitutes a discharge of waste to land. When water contacts these mine tailings the quality becomes significantly altered producing what is generally called "acid mine drainage". Acid mine drainage poses a serious threat to the beneficial uses of receiving waters in that it is very acidic and contains high concentrations of dissolved metals in exceedence of water quality objectives.

4. The Site is located in a steep ravine approximately one-half mile northeast of the intersection of Interstate 580 and State Highway 13, in the hills of Oakland. A residential community borders to the west and south, Merrit College lies to the east, and an undeveloped area borders the northern boundary. The closest private residence is located below the Site, approximately 25 feet south of one of the mine tailings pile, and 50 feet from the Site property line. The Site covers approximately two acres. The watershed above the area is approximately 50 acres in size and consists of shrub- and grass-covered hills and ravines. Ephemeral streams drain this upper watershed and pass directly through the Site. In addition, there is one spring fed perennial stream in which the headwaters appears to be a buried mine adit in the upper tailings pile.

   Flows emerging at and passing through the Site follow a natural drainage channel of several hundred feet and then enter a storm drain near the intersection of Mountain Boulevard and Griffin Street. The storm drain discharges to Lake Aliso on the Mills College Campus, and ultimately discharges to San Leandro Bay via Line "J" of the Alameda County Flood Control and Water Conservation District's Storm Drain System.

5. The Site is underlain by the Leona Rhyolite bedrock formation. The Leona Rhyolite is a highly fractured volcanic deposit containing irregular, discontinuous lenses of massive sulfur and sulfuric mineral deposits (such as pyrite). Volcanic activity took place in this area approximately 2 to 10 million years ago and is most likely related to movement along the North American and Pacific Plates. Active faults in the area include the San Andreas, Calaveras, and Hayward faults. The Site is located approximately 0.5 miles from the nearest mapped trace of the Hayward fault.

6. The dischargers conducted a limited survey of groundwater wells within a half mile radius of the Site. Four irrigation and four monitoring wells were located below the Site within the subdrainage basin. These eight wells are located on the Mills College Campus. The occurrence and potential beneficial uses of groundwater beneath the Site and within the Subdrainage basin, and the potential threat mining activities at the Site may pose to groundwater resources has not been evaluated.

7. The Site contains three mine tailings piles defined as: the Upper Tailings Pile, the Lower Tailings Pile, and the Side Tailings Pile. Two mine adits are located in the Upper Tailings Pile. One is closed with iron rails and partially buried. The second is located

approximately 50 feet below, partially buried, and appears to be the source of the on-Site perennial spring. The Site also contains three mine shafts of which two have been sealed with concrete blocks, and the third partially filled with mine tailings.

8. The tailings were analyzed for California Health and Safety Code, Title 22 metals and pH. All metals concentrations were below the Title 22 CCR Section 66699 Total Threshold Limit Concentrations which are the criteria used to characterize material as hazardous waste.

9. Water samples were taken in January 1989 during dry weather, and March 1990 during wet weather. Samples were taken where the perennial spring emerges at the bottom of the Upper Tailings Pile and downstream, below the Lower Tailing Pile. Wet weather samples represent a mixture of the spring discharge water and stormwater runoff which has been in contact with mining waste. Dry weather samples are representative of the spring fed perennial stream measured to flow at 18 gallons per minute. Wet and dry weather samples were taken in similar locations. Sample results are summarized in Table 1 (below).

Table 1.
SURFACE WATER SAMPLES (concentrations in ug/L)

	Dry Weather Sampling		Wet Weather Sampling		
	Spring	Site Bottom	Spring	Site Bottom	Water Quality Objective*
Compound					
Arsenic	6.0	<2.0	1700	170	190
Cadmium	8.5	12.0	57.0	21.0	3.5
Chromium	<5.0	<5.0	200	53.0	11.0
Copper	1100	1600	32,000	6500	40.0
Lead	3.0	<2.0	7.0	14.0	19.8
Nickel	22.0	50.0	300	150	530
Zinc	3200	4000	13,000	5700	357
pH	4.4	3.0	3.18	2.87	6.5 - 8.5
Hardness	420,000				

* Water quality objectives are for the protection of freshwater aquatic life, 4-day average, and estimated using a total hardness of 420 mg/l.

The increased metals concentrations observed during storm events and wet weather discharges may be attributed to lower pH levels associated with rainwater contacting the tailings.

10. Mining Wastes pose a serious threat to water quality. Storm water drainage within the watershed that contacts the waste has metals concentrations which exceed the water quality objectives necessary to protect the beneficial uses of receiving waters. In

accordance to the California Water Code, Title 23, Chapter 15, Article 7, Section 2571, Tailings Piles at this Site are assigned to the Group B mining waste classification defined as, "Mining wastes that consist of or contain nonhazardous soluble pollutants of concentrations which exceed water quality objectives for, or could cause, degradation of waters of the State."

11. The ROWD contains an estimate of the mass loading of metals discharged during wet and dry weather. The analytical data listed in Table 1 (above) were used to estimate metals concentrations in the perennial stream below the Site. A flow rate of 18 gallons per minute, based on the measured flow of the spring, was used for the dry weather calculations. Wet weather flows were calculated using a mean annual precipitation of 26 inches per year, a 50 acre watershed, and 30% runoff. Under these assumptions, it was determined that 92% of the total mass loading of metals occurs during wet weather.

12. The dischargers has proposed in the ROWD to undertake corrective actions at the Site in a phased approach generally consisting of:

    a. Capping, consolidating, and isolating all tailings from stormwater in order to eliminate the major source of metals loadings to receiving waters.
    b. Collecting all mine adit waters and acid groundwater seeps and assessing the potential impacts to beneficial uses of receiving waters in order to determine the necessity and degree of additional corrective actions needed.

13. The Board adopted a Water Quality Control Plan (Basin Plan) for the San Francisco Bay Region in December 1986. These requirements are consistent with that Plan.

14. The Basin Plan defines beneficial uses for all major waterbodies in the Region. The beneficial uses listed below serve as a basis for establishing water quality objectives for all receiving waters potentially impacted by waters released from the Site. The existing and potential beneficial uses of Lion Creek, Lake Aliso, and San Leandro Bay are:

    Agricultural Water Supply
    Water Contact Recreation
    Non-Contact Water Recreation
    Warm Fresh Water Habitat
    Wildlife Habitat
    Preservation of Rare and Endangered Species
    Shellfish Harvesting
    Estuarine Habitat
    Ocean Commercial and Sport Fishing
    Industrial Service Supply

15. The State Water Resources Control Board, in April 1991, adopted the California Inland Surface Water Plan. These requirements are consistent with that Plan.

16. The dischargers is negotiating to transfer approximately 130 acres of its property, including the Site, to the East Bay Regional Parks District.

17. The action to adopt waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality Act, in accordance with section 15301, Title 14, California Administrative Code.

18. The Board has notified the dischargers and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

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

It is HEREBY ORDERED that Ridgemont Development, Inc.; Watt Residential, Inc. and Watt Industries/Oakland, Inc. dba Ridgemont Development, Inc.; Watt Industries/Oakland, Inc.; Watt Residential, Inc.; Watt Housing Corporation; Alcoa Construction Systems, Inc.; Challenge Developments, Inc.; AP Construction Systems, Inc.; F.M. Smith and Evelyn Ellis Smith; Realty Syndicate; and Aluminum Company of America shall meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder and shall also comply with the following:

A. PROHIBITIONS

1. The disposal of waste shall not create a condition of pollution or nuisance as defined in Sections 13050(l) and 13050(m) of the California Water Code.

2. Mining Wastes shall not be disposed of or placed in any position where they can be carried from the disposal Site and discharged into waters of the State.

3. No post-closure land uses shall be permitted that might impair the integrity of containment structures.

B. DISCHARGE SPECIFICATIONS

1. The dischargers shall operate the mining waste disposal unit so as not to cause an impact in beneficial uses of receiving waters. The dischargers shall propose Water Quality Protection Standards (WQPS) and compliance monitoring points according to the requirements of this Order and Article 5 of Chapter 15 within 2 years of adoption of this Order. WQPS shall be proposed for the following parameters:

a. pH-
b. Total Dissolved Solids-
c. Arsenic-
d. Cadmium-
e. Chromium-
f. Copper-
g. Lead-
f. Nickel-
g. Zinc-

2. The dischargers shall install any additional leachate and groundwater monitoring devices required to fulfill the terms of any Self-Monitoring Program issued to the dischargers in order that the Board may evaluate compliance with the conditions of this Order.

3. The Site shall be protected from any washout or erosion of wastes or covering material and from inundation which could occur as a result of a 100 year 24 hour precipitation event.

C. PROVISIONS

1. The dischargers shall comply with all Prohibitions, Specifications, and Provisions of this Order immediately upon adoption of this Order.

2. The dischargers shall submit a report of **Financial Responsibility Assurance** acceptable to the Executive Officer.. The dischargers shall provide for adequate funding to pay for the cost of closure and post-closure maintenance, monitoring, and foreseeable corrective action.
REPORT DUE DATE: May 15, 1992

3. The dischargers shall submit a report on **Alternative Disposal Options.** This report shall evaluate the feasibility of 1) disposing of all tailings off-Site, and 2) treating or neutralizing the tailings. If off-site disposal or treatment is determined by the Executive Officer to be infeasible, the dischargers shall consolidate and incapsulate the tailings in a manner as to best isolate the mining waste from stormwater runoff and groundwater.
REPORT DUE DATE: April 30, 1992

4. The discharge may be exempted from Chapter 15, Article 7 requirements for liners and leachate collection systems if a comprehensive hydrologic investigation demonstrates that: (1) there are only minor amounts of groundwater underlying the area; or (2) the discharge is in compliance with the applicable water quality plans; and (3) either natural conditions or containment structures will prevent lateral hydraulic interconnection with natural geologic materials containing

groundwater suitable for agricultural, domestic, or municipal beneficial uses. If the dischargers proposes the above described exemption, a **Hydrologic Investigation Report** acceptable to the Executive Officer shall be submitted.
REPORT DUE DATE: October 15, 1992

5. The discharge shall submit a **Workplan and Implementation Schedule for Stormwater Volume Reduction and Control Measures** acceptable to the Executive Officer. This Plan shall address Long and short term measures which shall be taken to minimize the amount of stormwater and surface runoff within the surrounding watershed. The feasibility and effectiveness of revegetating areas upland of the Site and controlling runoff from the upper parking lots shall be evaluated in this regard.
REPORT DUE DATE: September 15, 1992

6. The dischargers shall submit a **Corrective Action Plan and Implementation Schedule,** acceptable to the Executive Office, in order to consolidate and incapsulate the tailings in a manner as to best isolate the mining waste from stormwater runoff and groundwater. This Plan shall address the following:
   a. All mine adits on the property shall be sealed, and any acidic discharge or drainage waters shall be collected.
   b. A leachate collection, monitoring, and control system shall be designed, maintained, and operated in order to collect waters which may percolate through the tailings and any mine adit drainage waters and/or acidic groundwater seeps, and minimize the buildup of hydraulic head on the bottom of the capped waste pile.
   c. The dischargers shall ensure that the recapping and regrading of the tailings, the leachate collection system and the storm water control system are designed, constructed, and maintained in order to withstand conditions generated during the maximum probable earthquake.

REPORT DUE DATE: January 5, 1993

7. The dischargers shall submit a detailed **Post-earthquake Inspection and Corrective Action Plan** to be implemented in the event of any earthquake generating ground shaking of Modified Mercalli Intensity V or greater at or near the Site. The plan shall provide for reporting results of the post earthquake inspection to the Board within 48 hours of the occurrence of the earthquake. In the event of any damage due to liquefaction, or other slope failure, the corrective action plan shall be implemented immediately, and the Board notified immediately.
REPORT DUE DATE: January 5, 1993

8. The dischargers shall submit and implement a **Short Term Monitoring Program** acceptable to the Executive Officer. This program shall be aimed at assessing the effectiveness of remediation activities and evaluating whether additional water treatment will be needed.

REPORT DUE DATE: November 1, 1992

9. The dischargers shall submit a **Corrective Action Evaluation Report** consisting of the results of the short-term monitoring efforts, an evaluation of the effectiveness of corrective action activities, and a proposal for long term monitoring identifying compliance monitoring points and water quality protection standards, and additional remediation efforts which may be necessary in order to meet such standards.
REPORT DUE DATE: October 30, 1994

10. The discharge shall comply with all conditions of these Waste Discharge Requirements and applicable provisions of Chapter 15 that are not specifically referred to in this Order. Violations may result in enforcement orders, including Board orders or court orders requiring corrective action or imposing civil monetary liability, or in modification or revocation of these Waste Discharge Requirements by the Board.

11. The post-closure maintenance shall end when the Board determines that the water quality aspects of reclamation are complete and wastes no longer pose a threat to water quality.

12. The dischargers shall notify the Board in writing of any proposed change of ownership or responsibility for construction, operation, closure, or post-closure maintenance of the mining waste management unit. This notification shall be given prior to the effective date of the change and shall include a statement by the new dischargers that construction, operation, closure, and post-closure maintenance will be in compliance with any existing waste discharge requirements and any revisions thereof. The Board shall amend the existing Waste Discharge Requirements to name the new dischargers.

13. All reports submitted pursuant to these Provisions shall be prepared under the supervision of a registered civil engineer or certified engineering geologist.

14. These requirements do not authorize commission of any act causing injury to the property of another or of the public; do not convey any property rights; do not remove liability under Federal, State, or Local laws; and do not authorize the discharge of wastes without appropriate permits from other agencies or organizations.

15. This Order is subject to Board review and updating, as necessary, to comply with changing State or Federal laws, regulations, policies, or guidelines; changes in the Board's Basin Plan; or changes in the discharge characteristics, in five year increments from the effective date of this Order.

16. Where the dischargers becomes aware that it failed to submit any relevant facts in a ROWD or submitted incorrect information in any reports to the Board, it shall promptly submit such facts or information.

17. Provisions of these Waste Discharge Requirements are severable. If any provision of these requirements are found invalid, the remainder of these requirements shall not be affected.

18. The dischargers shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the dischargers to achieve compliance with conditions of this Order. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Order.

19. All monitoring instruments and devices used by the dischargers to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to insure their continued accuracy.

20. Unless otherwise permitted by the Executive Officer, all analyses shall be conducted at a laboratory certified for such analyses by the California Toxics Substances Control Program. All analyses shall be required to be conducted in accordance with the latest edition of "Guidelines for Establishing Test Procedures for Analysis of Pollutants" (40 CFR Part 136) promulgated by the U.S. Environmental Protection Agency.

21. The dischargers shall retain records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained for a minimum of three years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Executive Officer. Records of monitoring information shall include:
    a. The date, exact place, and time of sampling or measurements;
    b. The individuals who performed the sampling or the measurement;
    c. The date analyses were performed;
    d. The individual(s) who performed the analyses;
    e. The analytical techniques or methods used; and
    f. The results of such analyses.

22. All application reports or information submitted to the Executive Officer shall be signed and certified by a principal executive officer of at least the level of vice president. The person signing the document shall make the following certification:

> "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

I, Steven R. Ritchie, Executive Officer, do hereby certify that the foregoing is a full, complete, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on 8/19/92.

Steven R. Ritchie
Executive Officer