

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORTS

DATE RECEIVED
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LAFARGE CANADA INC.

**KAMLOOPS CEMENT PLANT
WESTERN REGION**

LIMESTONE QUARRY MANAGEMENT

MINING PLAN

NOVEMBER 1993

**GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT**

FILMED

24,554

prepared by:

**CORPORATE TECHNICAL SERVICES
GEOLOGY AND RAW MATERIALS**

**JEAN-GUY LEVAQUE, MANAGER G&RM
ALAIN BEAUDET, MINING GEOLOGIST
MARIE DE GROSBOIS, SENIOR GEOLOGIST**

MINFILE NUMBER: 092INE001

NATIONAL MINERAL INVENTORY:

NAME(S): HARPER RANCH, LAFARGE CANADA, KAMLOOPS

STATUS: Producer
NTS MAP: 092109E
LATITUDE: 50 40 15
LONGITUDE: 120 03 56
ELEVATION: 0549 Metres
LOCATION ACCURACY: Within 500M
COMMENTS: Location centred on quarry 18.0 kilometres due east of Kamloops (NTS Map 921/09).

Open Pit

MINING DIVISION: Kamloops
UTM ZONE: 10
NORTHING: 5617111
EASTING: 707351

COMMODITIES: Limestone

MINERALS

SIGNIFICANT: Calcite
ASSOCIATED: Silica Quartz Siderite Limonite
MINERALIZATION AGE: Pennsylvan.-Permian
ISOTOPIIC AGE: DATING METHOD: Fossil MATERIAL DATED: Conodonts/Fusulini

DEPOSIT

CHARACTER: Stratabound Massive
CLASSIFICATION: Sedimentary Industrial Min.
TYPE: Limestone
SHAPE: Tabular
MODIFIER: Folded Faulted
DIMENSION: 3000 x 2500 Metres STRIKE/DIP: 020/40E TREND/PLUNGE:
COMMENTS: Attitude of east limb of southward plunging syncline.

HOST ROCK

DOMINANT HOST ROCK: Sedimentary

STRATIGRAPHIC AGE GROUP FORMATION IGNEOUS/METAMORPHIC/OTHER
Paleozoic-Mesozoic Harper Ranch Undefined Formation
DATING METHOD: Fossil
MATERIAL DATED: Conodonts/fusulinids/corals

LITHOLOGY: Limestone
Chert
Sandstone
Conglomerate
Argillite
Quartzite

HOST ROCK COMMENTS: Harper Ranch limestones in Ashcroft map sheet are Mississippian to Permian in age.

GEOLOGICAL SETTING

TECTONIC BELT: Intermontane PHYSIOGRAPHIC AREA: Thompson Plateau
TERRANE: Harper Ranch

INVENTORY

ORE ZONE: HARPER RANCH

CATEGORY: Proven YEAR: 1989

QUANTITY: 16000000 Tonnes

COMMODITY GRADE
Limestone 99.0000 Per cent

COMMENTS: Reserves are estimated to last for 80 to 100 years at a current production rate of 160,000 tonnes a year. Grade not given.

REFERENCE: J. Wong, personal communication, 1989.

CAPSULE GEOLOGY

An irregular, north trending mass of Permian-Mississippian limestone of the Devonian to Triassic Harper Ranch Group, 3 kilometres in length and up to 2.5 kilometres in width, outcrops on the north side of the South Thompson River, 18 kilometres due east of Kamloops. To the east the limestone is overlain by sandstone and conglomerate containing clasts of andesitic to basaltic volcanics of the Upper Triassic Nicola Group. To the west the limestone contacts argillite and quartzite of the Harper Ranch Group. The limestone mass appears to be situated along the crest of an anticline plunging 20 degrees south. Bedding on the east limb of the fold strikes 020 degrees and dips 40 degrees east. Conodont sampling in a quarry on the south end of the deposit reveals the limestone is broken up into at least two sequences dipping 50 to 80 degrees southeast that are repeated by a fault on the west margin of the quarry. The quarry exposes a number of basaltic and lamprophyric dykes 0.15 to 3.0 metres wide striking 090 degrees and dipping 70 degrees north.

The mass is made up of fine to medium-grained, light to dark

CAPSULE GEOLOGY

grey limestone with abundant white to grey chert as nodules, irregular patches up to 0.6 metres wide, and as discontinuous bands 0.1 to 0.6 metres thick. The chert is more frequent near the margins of the deposit. A 60 to 90 metre wide central zone is relatively free of chert. Quartz tends to occur as fine, silty aggregates that form up to 50 per cent of the rock. The limestone in the quarry is commonly veined with iron carbonate (siderite) and cut by faults containing hydrous iron oxides (limonite). In places the limestone grades up to 95 per cent CaCO₃ within the quarry (John Wong, personal communication, 1989). A chip sample taken across a 91.4 metre thick section of purer limestone northeast of the quarry contained 55.04 per cent CaO, 0.46 per cent MgO, 0.42 per cent SiO₂, 0.09 per cent Al₂O₃, 0.07 per cent Fe₂O₃ and nil sulphur (CANMET Report 811, page 184, Sample 49).

Lafarge Canada Inc. began quarrying the south end of the Harper Ranch deposit in 1970 to supply an adjacent cement plant. Up to 1988, 3.6 million tonnes of limestone have been quarried. Remaining reserves are estimated to last for 80 to 100 years at a current production rate of approximately 160,000 tonnes a year (John Wong, personal communication, 1989).

BIBLIOGRAPHY

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89; 1988, p. 89
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EMPR IND MIN FILE (*Report by McCammon, J.W. (1950), pp. 2-5;
Report by G. White)
CANMET RPT *811, Part 5, p. 184
GSC MEM 249, p. 7
GSC P 82-1A, pp. 293-297; 85-1A, pp. 349-358; 88-8, pp. 2,3
GSC MAP 886A
GSC OF 637; 980

DATE CODED: 850724
DATE REVISED: 890803

CODED BY: GSB
REVISED BY: PSF

FIELD CHECK: N
FIELD CHECK: N

MINFILE NUMBER: 092INE001

NAME: HARPER RANCH

STATUS: Producer

Production Year	Tonnes Mined	Tonnes Milled	Commodity	Grams Recovered	Kilograms Recovered
1991	605,342	605,342	Limestone		605,342,000
1990	282,280	282,280	Limestone		282,280,000
1989	211,115	211,115	Limestone		211,115,000
1988	166,750	166,750	Limestone		166,750,000
1987	155,336	155,336	Limestone		155,336,000
1986	126,894	126,894	Limestone		126,894,000
1985	68,444	68,388	Limestone		68,444,000
1984	86,558	86,558	Limestone		86,558,000
1983	169,244	169,244	Limestone		169,244,000
1982	244,367	242,806	Limestone		244,367,000
1981	300,439	300,439	Limestone		300,439,000
1980	250,884	250,884	Limestone		250,884,000
1979	243,821	243,821	Limestone		243,821,310
1978	266,537	266,537	Limestone		266,537,000
1977	267,586	267,586	Limestone		267,585,920
1976	255,766	255,766	Limestone		255,766,210
1975	259,934	259,934	Limestone		259,933,810
1974	188,540	201,616	Limestone		188,540,190
1973	203,270	205,347	Limestone		203,270,150
1972	157,176	156,275	Limestone		157,176,090
1971	141,469	141,531	Limestone		141,469,100
1970	73,151	52,232	Limestone		73,150,838

SUMMARY TOTALS: 092INE001

NAME: HARPER RANCH

	Mined:	Metric	Imperial	
Recovery:	Mined:	4,724,903 tonnes	5,208,314 tons	
	Milled:	4,716,681 tonnes	5,199,251 tons	
	Limestone:	4,724,903,618 kilograms	10,416,626,464 pounds	

NAME:

Jean-Guy Levaque

QUALIFICATIONS:

Ecole Polytechnique, Montréal (1970)
Ingénieur géologue, B. ScA, B.A.

Member of l'Ordre des Ingénieurs du
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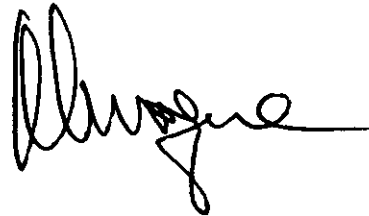


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*Pocket
Pocket*

*Pocket
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3. MINING PLAN

A long-term mining operation plan for the limestone quarry has been defined according to the following objectives:

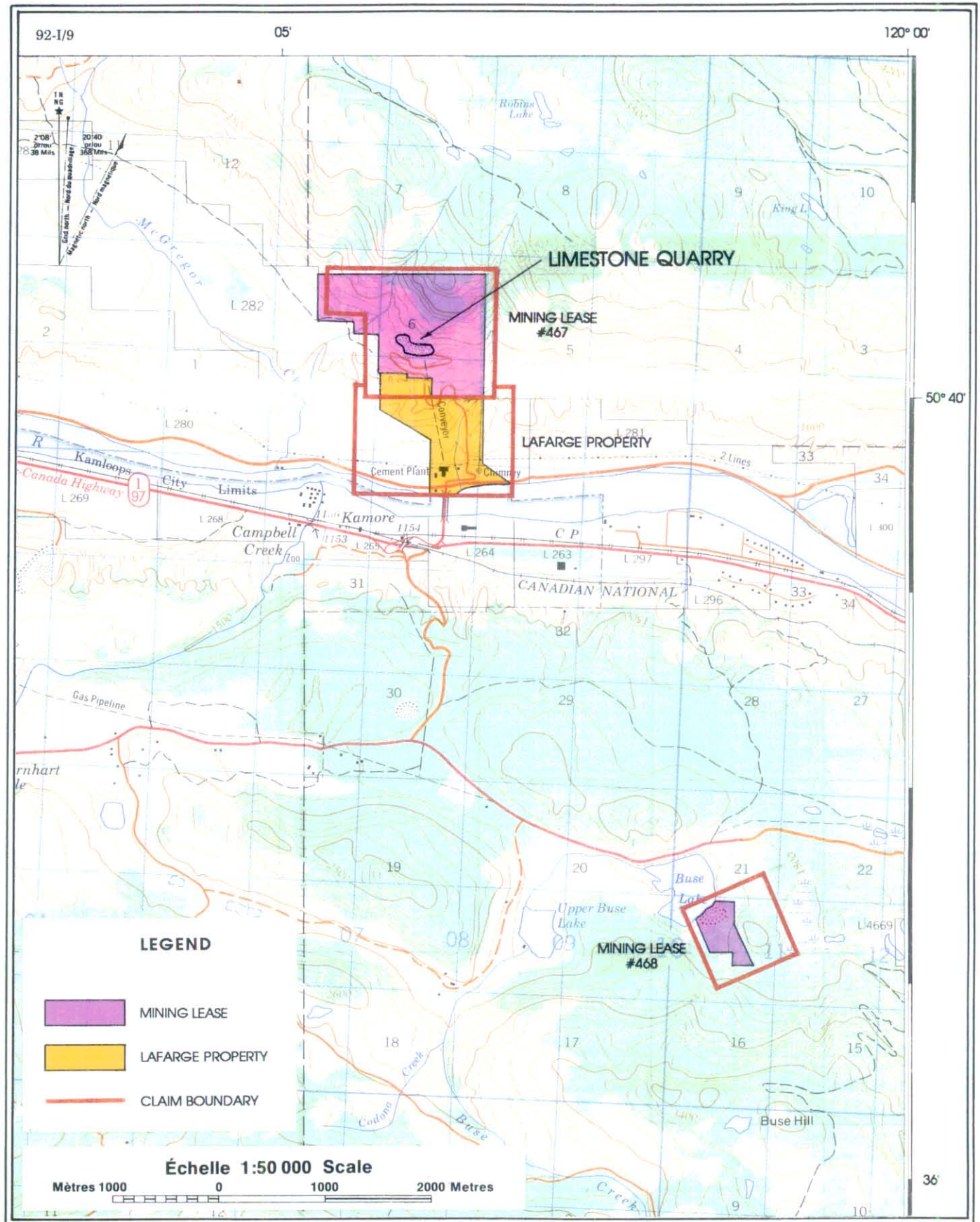
- locate and define high-calcium reserves, accessible at any time;
- develop a mining operation plan according to the actual rate of limestone extraction and according to B.C. mining regulations; and
- produce a blast design map with their expected chemical content (BLASTCAD).

The mining operations at the limestone quarry should be done in an east to west direction, confined inside the actual pit contour, limited at the north by the actual foot-wall and at the south by the main ramp. The current quarried face, which is defined by Bench 506, will extend to the west up the fault [refer to Volume 1, Figure 6], getting deeper over an 8-bench operation [see Figure 1].

The quarried area will extend over a surface of about 62,000 m² or 6.2 ha.

A total of 6.0 million tonnes of quarriable limestone averaging up to 50% CaO are available within the present limestone quarry boundary. This represents a 23-year supply at the current extraction rate of 260,000 tonnes per year.

In this report, the upper part of the quarry located at Level 538 (northern extension of the actual pit) has not been included in our calculations, but for the purpose of quarry design, a rough estimate has been made of the reserves, as well as a preliminary quarry development plan.



LOCATION MAP OF THE KAMLOOPS CEMENT PLANT AND QUARRIES

Figure 1

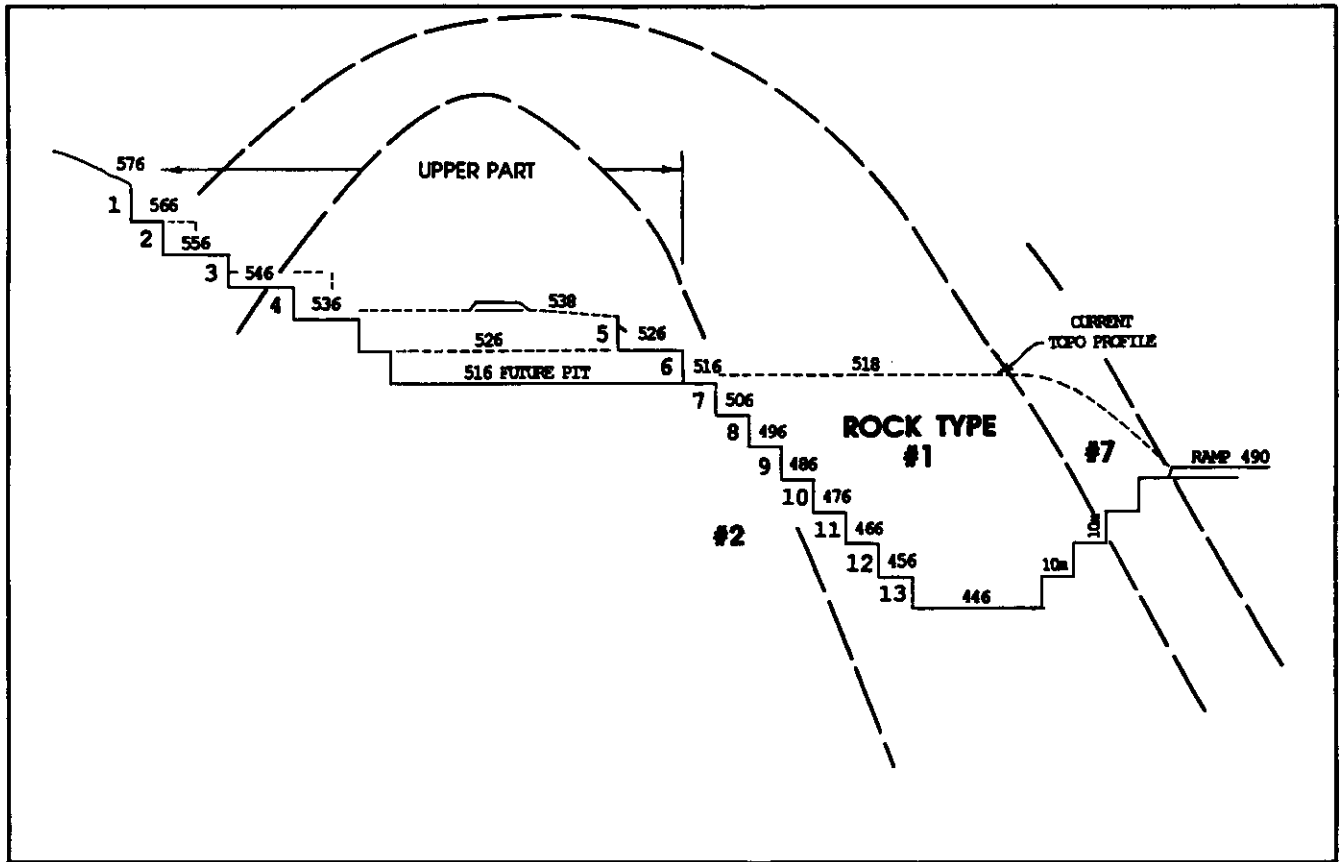
3.1 Design Parameters

For mining purposes, 5 major rock types have been considered: rock types 9, 7, 1, 2, and 8. The limestone units are: rock type 1 being high-calcium limestone; rock types 2 and 7 being siliceous limestones; rock type 9 is a massive chert horizon; and rock type 8 is a dyke material. The average chemical analysis of these units can be found in Section 2.2 of Volume 1.

The actual mining operation produces limestone material at the rate of 260,000 tonnes per year. This tonnage serves as the basis for the mining plan at the limestone quarry. Also, quarry planning is based on the total tonnage as defined from the mining position dated March 1993, being the last quarry survey update.

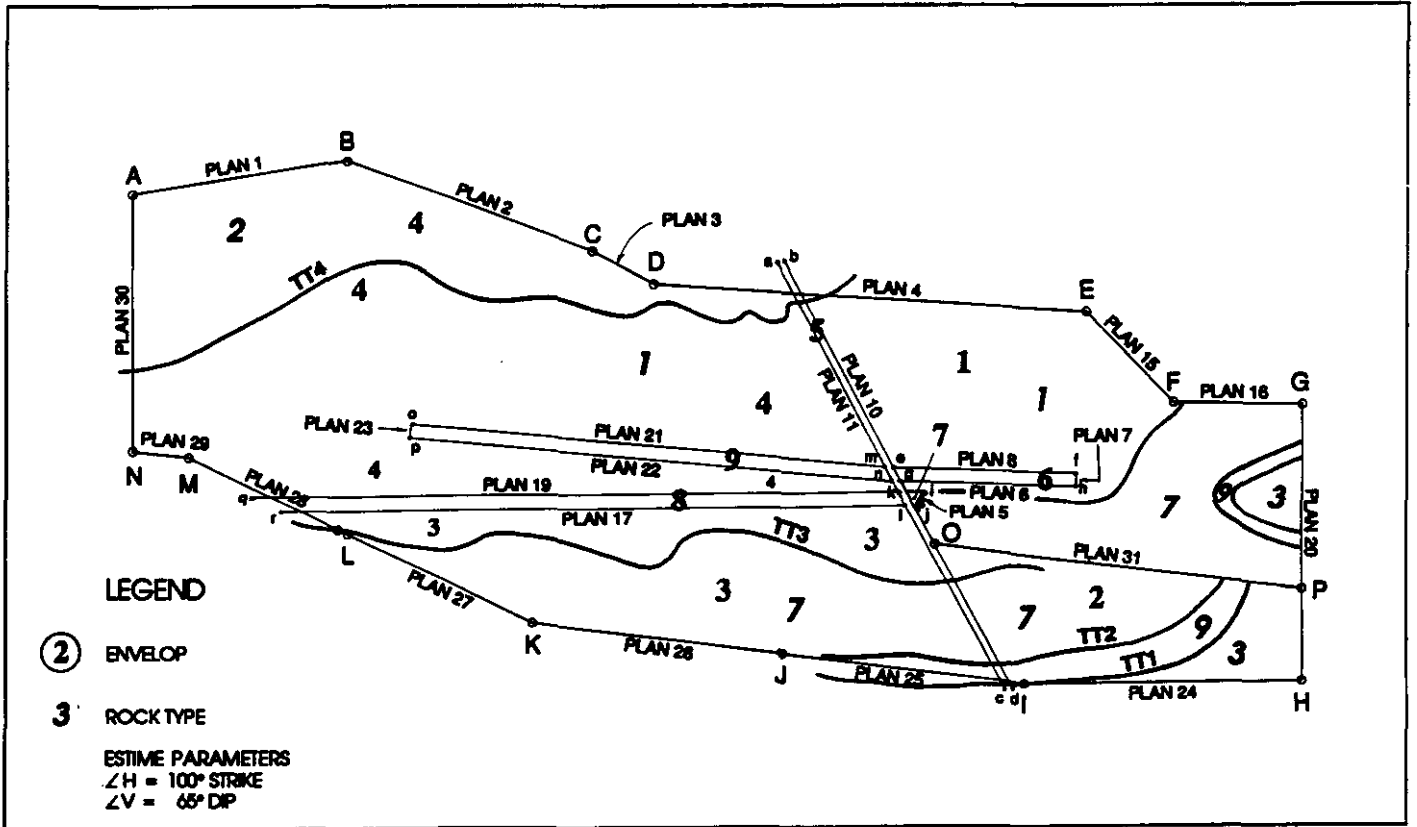
Based on the geological interpretation model [ref. Vol. 1, Section 2.3], the future mining development plan has been confined inside the actual quarry, getting deeper and limited to the west by the fault and to the south by the ramp. The limestone will be quarried from elevation 518 m to 446 m, on an 8-bench operation of 10-meters-thick each.

In the quarry area, the surface topographic profile dips steeply towards the south. At the northern end, the ground elevation is approximately 576 m and decreases southward to elevation 475 m at the crusher site [ref. Dwg. 11422-1993-29]. Therefore, in order to integrate the geological model with reserves estimation within the QMS (Quarry Management System) computer program, the whole quarry was divided into 13 benches, 31 plans and 5 topographic files, over which only Benches 6 to 13 will be quarried [see Figure 2, Table 1, Figure 3 and Appendix 1; and also Geological Section in Vol. 1, Annex 3].



SCHMATIC SECTION OF THE QUARRY DEVELOPMENT

Figure 2



SCHEMATIC GENBLOCK MODEL

Figure 3



TABLE 1

BENCH ELEVATIONS	
BENCH	ELEVATION (m)
1	576 - 566
2	566 - 556
3	556 - 546
4	546 - 536
5	536 - 526
6	526 - 516
7	516 - 506
8	506 - 496
9	496 - 486
10	486 - 476
11	476 - 466
12	466 - 456
13	456 - 446

The ramp has been established at 12 m wide and is located on the same side as the actual quarry ramp. For stability reasons, because of the rock formation dipping toward the south, all the ramps have been planned to be on the south side of the quarry at a slope of 8.5%.

3.2 Limestone Reserves (Tonnage & Chemistry)

The proposed mining plan is designed to quarry a total of 6.0 million tonnes, with a limestone density of 2.64 t/m³. The following Table 2 shows the mining reserves from each bench (rounded to the closest thousand).

TABLE 2

MINING RESERVES		
BENCH	TONNAGE	RAMP
516	268,000	---
506	952,000	---
496	1,314,000	---
486	1,195,000	---
476	968,000	18,600
466	690,000	18,600
456	432,000	18,600
446	246,000	18,600
Subtotal	6,065,000	74,400
Total	5,990,600 t	



The reserves chemical and tonnage analysis is made with the BLOCKCAD module of the QMS program, with a grid mesh of 5 m in (y) and 10 m in (x). Table 4 gives the average chemical analysis of the limestone for each bench. Figures 4 to 18 show the mining extent of each bench (#6 to #13), and the colors represent variations in the CaO content.

The BLOCKPLOT map for Benches 5 to 13, which can be found in the pockets in Appendix 2, shows the chemical content of SiO₂ and CaO with the rock type unit.

In addition, a rough estimate has been made of the reserves at the upper part of the quarry, located at Level 538 [see Figure 2]. In this area, a reserve of 880,000 tonnes of material can be used as siliceous limestone. However, this materials would need to be drilled in order to define and estimate the quality of this siliceous limestone. At this stage, we can assume that most of the material in the upper part has a composition equivalent to rock type 2 [see Table 2, Section 2.2.2 in Vol. 1]. For the purpose of this study, we have done a map showing the proposed future development of this area.

The following Table 3 is the reserve estimate of this area.

TABLE 3

MINING RESERVES TONNAGE (UPPER PART)		
BENCH	FLOOR	RAMP
526	449,941	---
536	275,405	---
546	117,005	1,964
556	26,189	8,173
Total	868,540 t	10,137 t
Floor + Ramp	878,677 t	



**TABLE 4
BENCH AVERAGE CHEMICAL ANALYSIS**

```

=====
Figure: BENCH_446      Group:      0      Level:    446.( 13)
Area:    9604.33      Tonnage:  245551.73  %Tot. area:  101.95
SI02:    2.7215      AL20:     0.8052      FE20:     0.6741
CAO:     52.6320      MGO:     0.9640      LOI:     42.1958
SO3:     0.0533      K20:     0.1315      NA20:     0.0533
TI02:    0.0401      P205:    0.0420      NAEQ:     0.1407
=====
    
```

```

=====
Figure: BENCH_456      Group:      0      Level:    456.( 12)
Area:    17058.73     Tonnage:  432184.31  %Tot. area:  103.07
SI02:    3.2057      AL20:     0.8779      FE20:     0.7256
CAO:     52.2610      MGO:     0.9366      LOI:     41.9426
SO3:     0.0593      K20:     0.1463      NA20:     0.0579
TI02:    0.0439      P205:    0.0422      NAEQ:     0.1546
=====
    
```

```

=====
Figure: BENCH_466      Group:      0      Level:    466.( 11)
Area:    28272.50     Tonnage:  688490.44  %Tot. area:  106.09
SI02:    4.0052      AL20:     0.7929      FE20:     0.7619
CAO:     51.8441      MGO:     0.9352      LOI:     41.5755
SO3:     0.0544      K20:     0.1295      NA20:     0.0515
TI02:    0.0438      P205:    0.0429      NAEQ:     0.1380
=====
    
```

```

=====
Figure: BENCH_476      Group:      0      Level:    476.( 10)
Area:    39586.77     Tonnage:  967353.44  %Tot. area:  106.90
SI02:    6.5079      AL20:     0.8664      FE20:     1.0243
CAO:     50.1808      MGO:     0.9859      LOI:     40.2402
SO3:     0.0574      K20:     0.1402      NA20:     0.0552
TI02:    0.0539      P205:    0.0449      NAEQ:     0.1506
=====
    
```

TABLE 4
BENCH AVERAGE CHEMICAL ANALYSIS
 (cont'd)

```

=====
Figure: BENCH_486      Group:      0      Level:    486.( 9)
Area:    50670.22     Tonnage: 1194601.88 %Tot. area: 108.80
SI02:    7.9380      AL20:    0.7775      FE20:    1.0880
CAO:    49.4306      MGO:    0.9864      LOI:    39.5723
SO3:    0.0565      K20:    0.1263      NA20:    0.0542
TI02:    0.0567      P205:    0.0461      NAEQ:    0.1387
=====
  
```

```

=====
Figure: BENCH_496      Group:      0      Level:    496.( 8)
Area:    57244.10     Tonnage: 1313534.38 %Tot. area: 104.81
SI02:    7.9146      AL20:    0.6743      FE20:    1.0371
CAO:    49.5759      MGO:    0.9829      LOI:    39.6179
SO3:    0.0583      K20:    0.1050      NA20:    0.0526
TI02:    0.0592      P205:    0.0462      NAEQ:    0.1166
=====
  
```

```

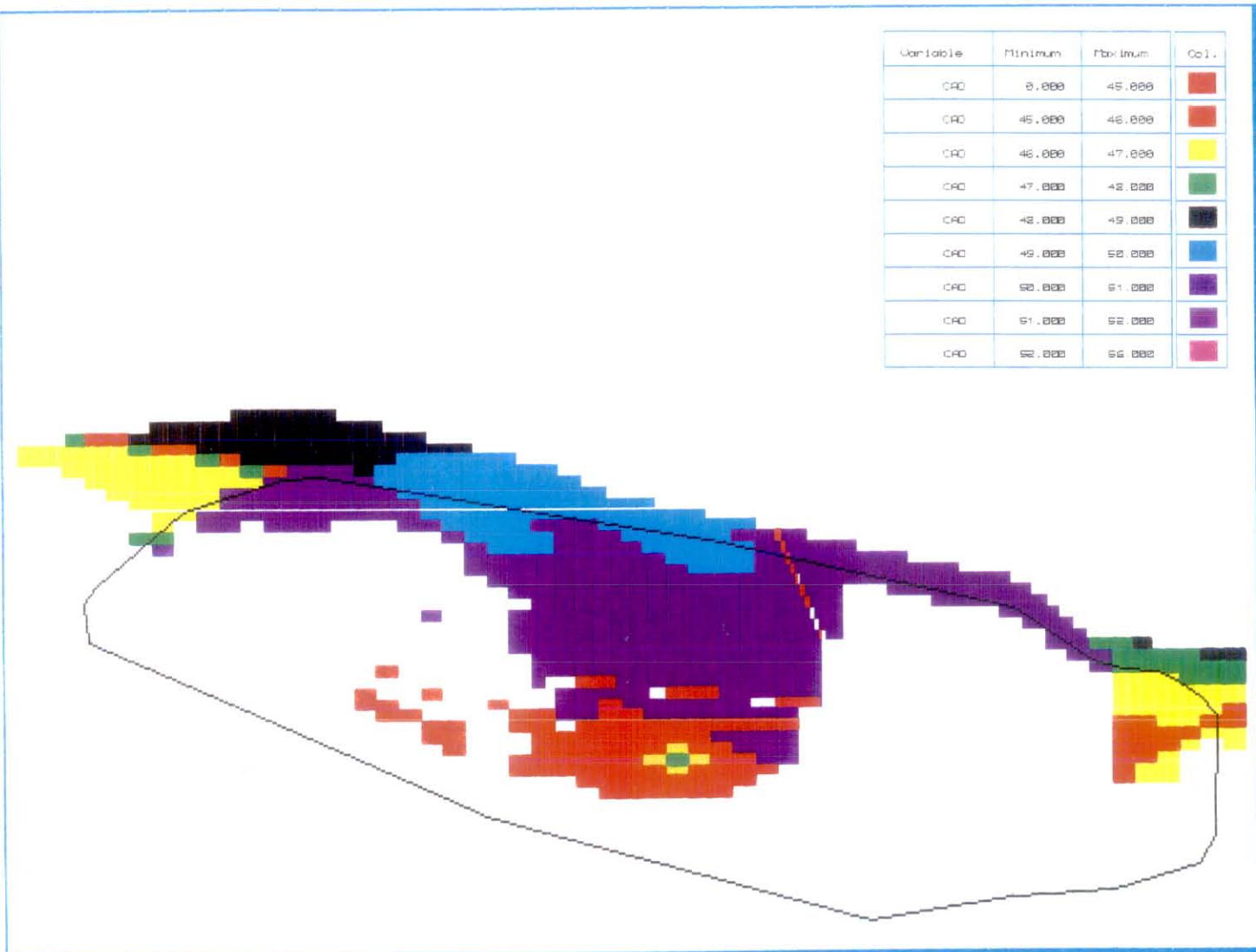
=====
Figure: BENCH_506      Group:      0      Level:    506.( 7)
Area:    55128.05     Tonnage: 951959.81 %Tot. area: 90.21
SI02:    6.8598      AL20:    0.7331      FE20:    1.0082
CAO:    50.1711      MGO:    1.0368      LOI:    40.0762
SO3:    0.0631      K20:    0.1221      NA20:    0.0500
TI02:    0.0699      P205:    0.0453      NAEQ:    0.1327
=====
  
```

```

=====
Figure: BENCH_516      Group:      0      Level:    516.( 6)
Area:    28785.15     Tonnage: 268099.44 %Tot. area: 43.03
SI02:    4.4195      AL20:    0.4960      FE20:    0.6201
CAO:    51.7866      MGO:    1.2547      LOI:    41.4890
SO3:    0.0624      K20:    0.0852      NA20:    0.0315
TI02:    0.0360      P205:    0.0426      NAEQ:    0.0874
=====
  
```



Variable	Minimum	Maximum	Col.
CAD	3.000	45.000	Red
CAD	45.000	46.000	Orange
CAD	46.000	47.000	Yellow
CAD	47.000	48.000	Green
CAD	48.000	49.000	Black
CAD	49.000	50.000	Blue
CAD	50.000	51.000	Purple
CAD	51.000	52.000	Dark Purple
CAD	52.000	56.000	Pink



BLKCAD
 (C) Geostat

LEVEL
 516(6)

SHADOW

* * *

Load
 Delete
 On
 Off
 Set

* * *

EXIT

↑ Ok
 Enter the name of a shadow figure to load: BENCH_516
 ↓ Shadow figure loaded.

Figure 4



G.R.M.
 CONSULTANTS

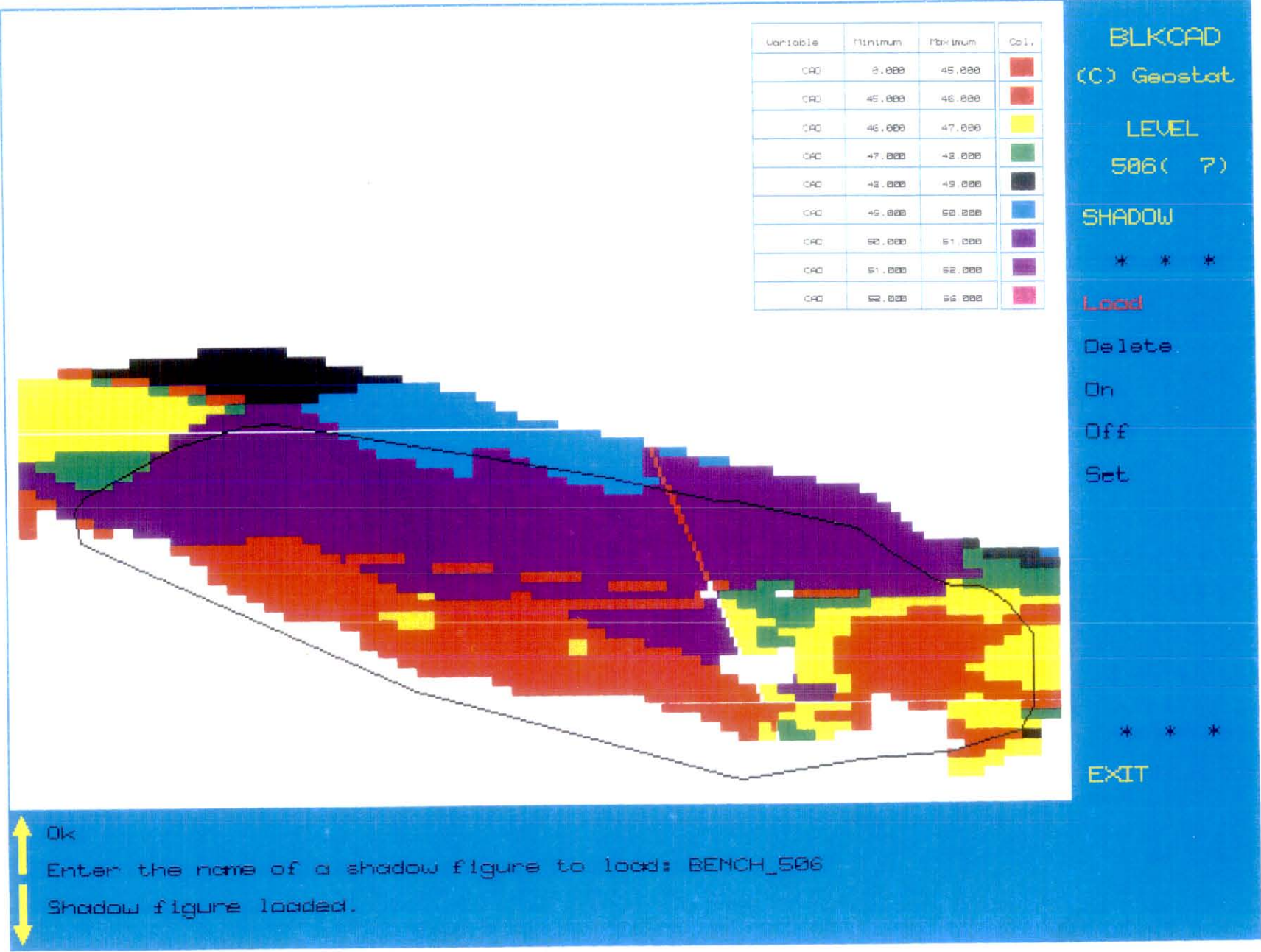
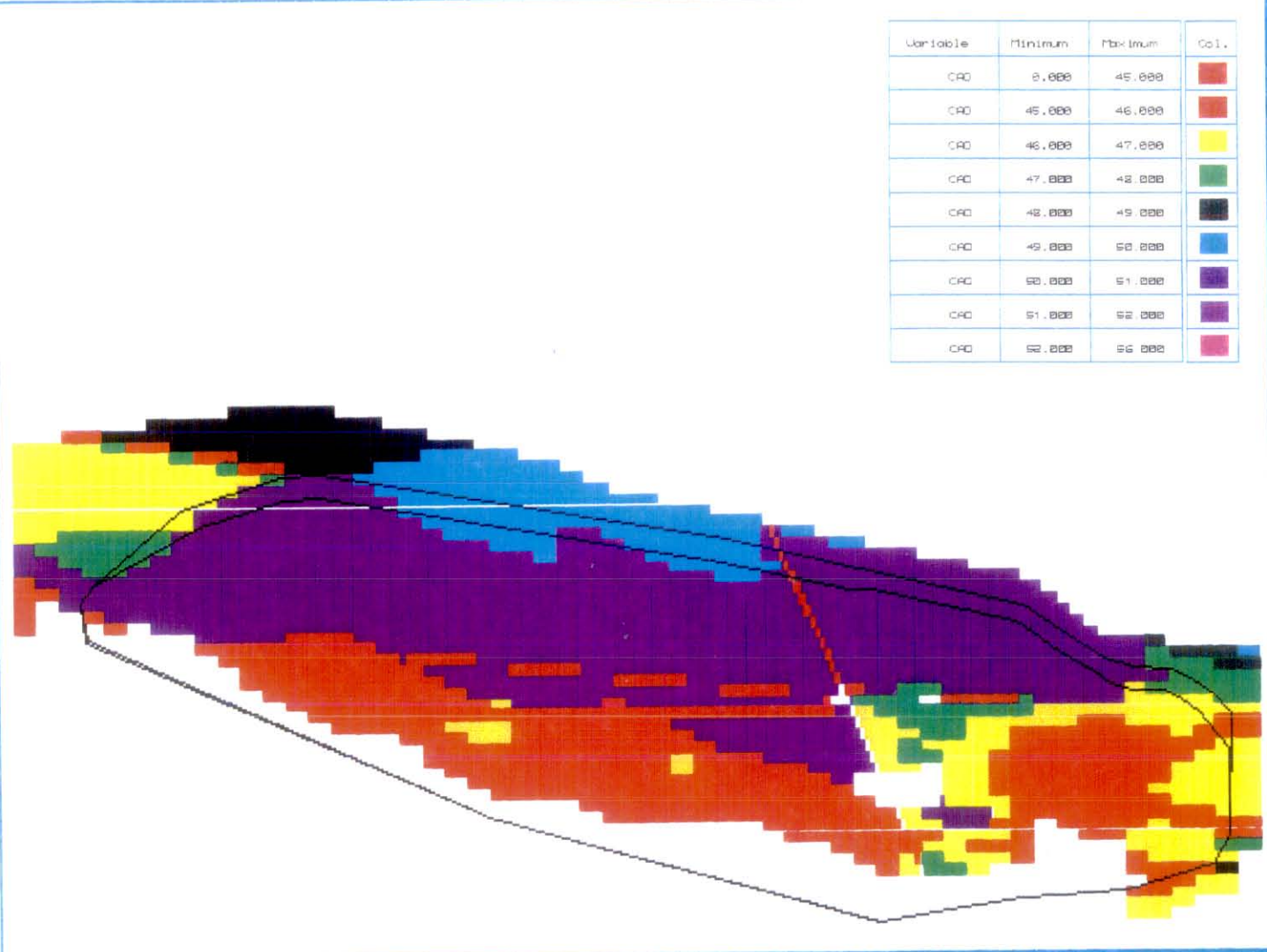


Figure 5



G.R.M.
CTS

Variable	Minimum	Maximum	Col.
CAD	8.000	45.000	Red
CAD	45.000	46.000	Dark Red
CAD	46.000	47.000	Yellow
CAD	47.000	48.000	Green
CAD	48.000	49.000	Black
CAD	49.000	50.000	Blue
CAD	50.000	51.000	Purple
CAD	51.000	52.000	Dark Purple
CAD	52.000	56.000	Pink



```

BLKCAD
(C) Geostat

LEVEL
506( 7)

SHADOW
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Load
Delete
On
Off
Set
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EXIT
  
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Figure 6



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BLKCAD
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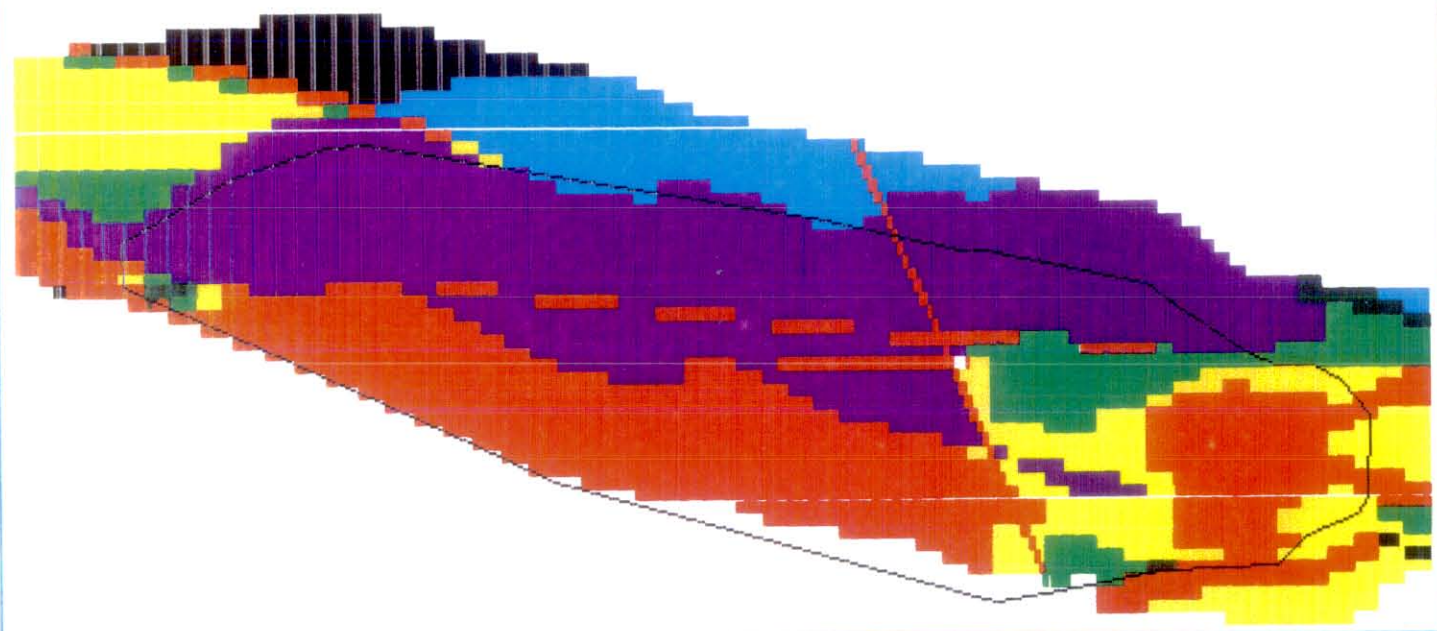
LEVEL
496( 8)

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On
Off
Set

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EXIT

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Variable	Minimum	Maximum	Col.
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CAD	45.000	46.000	Red
CAD	46.000	47.000	Yellow
CAD	47.000	48.000	Green
CAD	48.000	49.000	Black
CAD	49.000	50.000	Blue
CAD	50.000	51.000	Purple
CAD	51.000	52.000	Purple
CAD	52.000	56.000	Pink



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Figure 7

G.R.M.
CTS

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BLKCAD
(C) Geostat

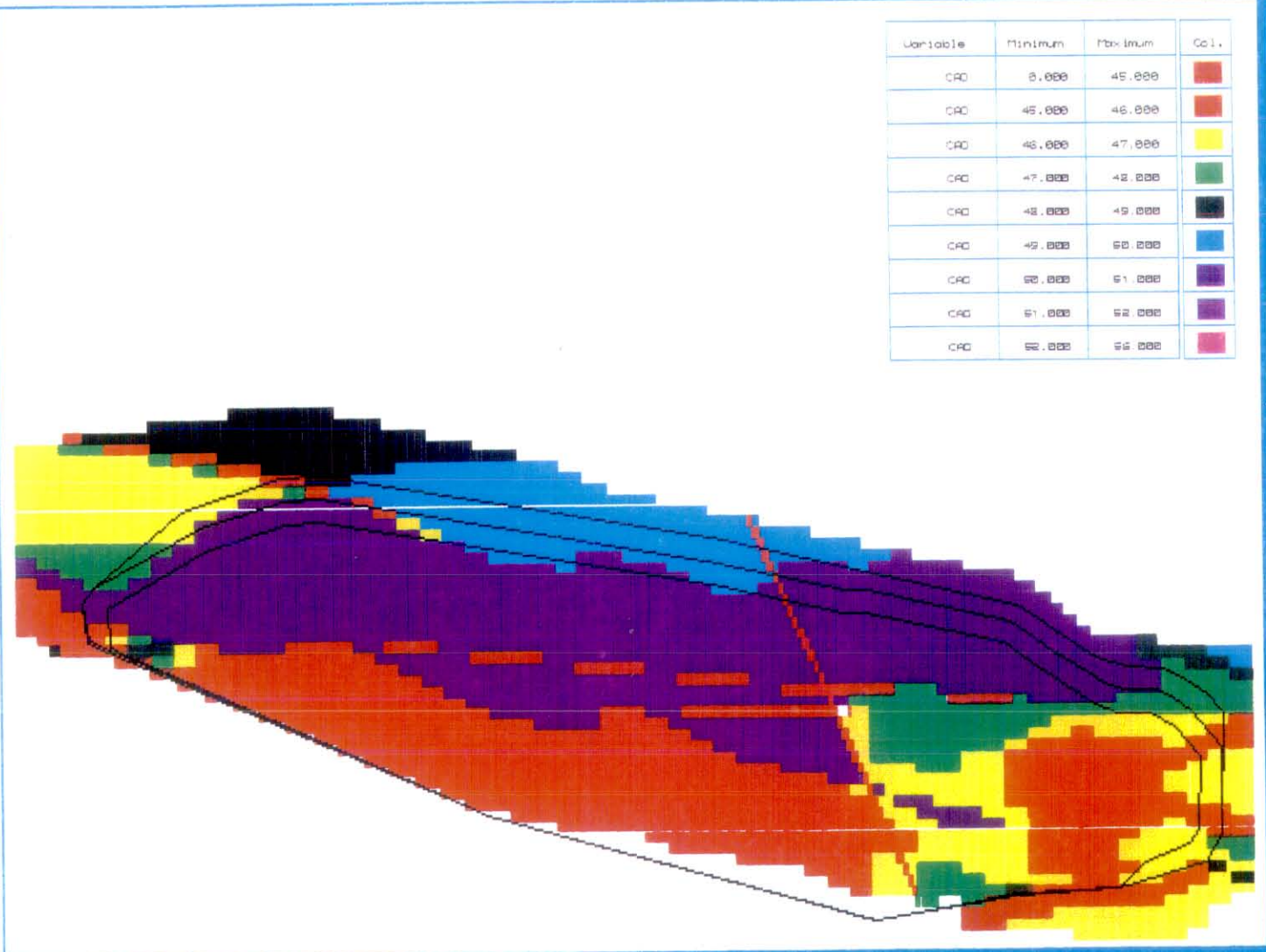
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Delete
On
Off
Set

* * *
EXIT

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CAD	45.000	46.000	Orange
CAD	46.000	47.000	Yellow
CAD	47.000	48.000	Green
CAD	48.000	49.000	Black
CAD	49.000	50.000	Blue
CAD	50.000	51.000	Purple
CAD	51.000	52.000	Dark Purple
CAD	52.000	56.000	Pink



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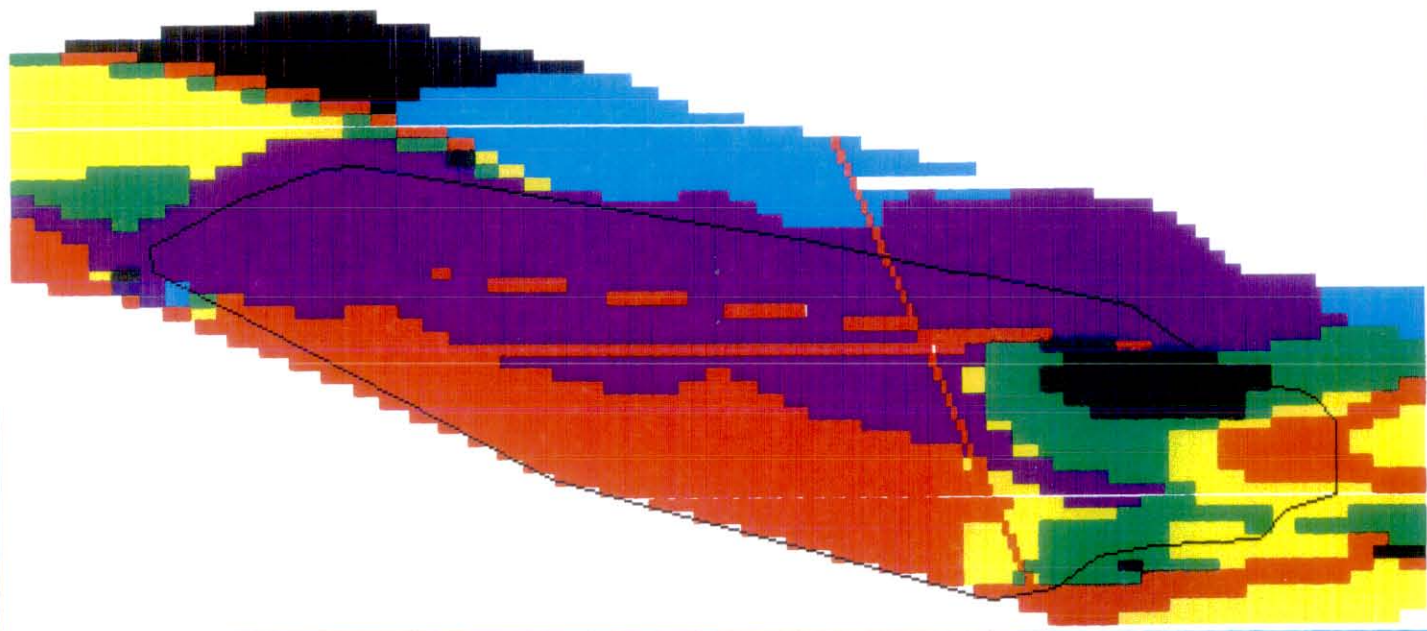
↑ Shadow figure loaded.
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Figure 8

 G.R.M.
CONSULTANTS

Variable	Minimum	Maximum	Col.
CAD	5.000	45.000	Red
CAD	45.000	46.000	Orange
CAD	46.000	47.000	Yellow
CAD	47.000	48.000	Green
CAD	48.000	49.000	Black
CAD	49.000	50.000	Blue
CAD	50.000	51.000	Purple
CAD	51.000	52.000	Dark Purple
CAD	52.000	55.000	Pink



```

BLKCAD
(C) Geostat

LEVEL
486( 9)

SHADOW
* * *
Load
Delete
On
Off
Set

* * *
EXIT

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OK
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Figure 9



G.R.M.
CTS

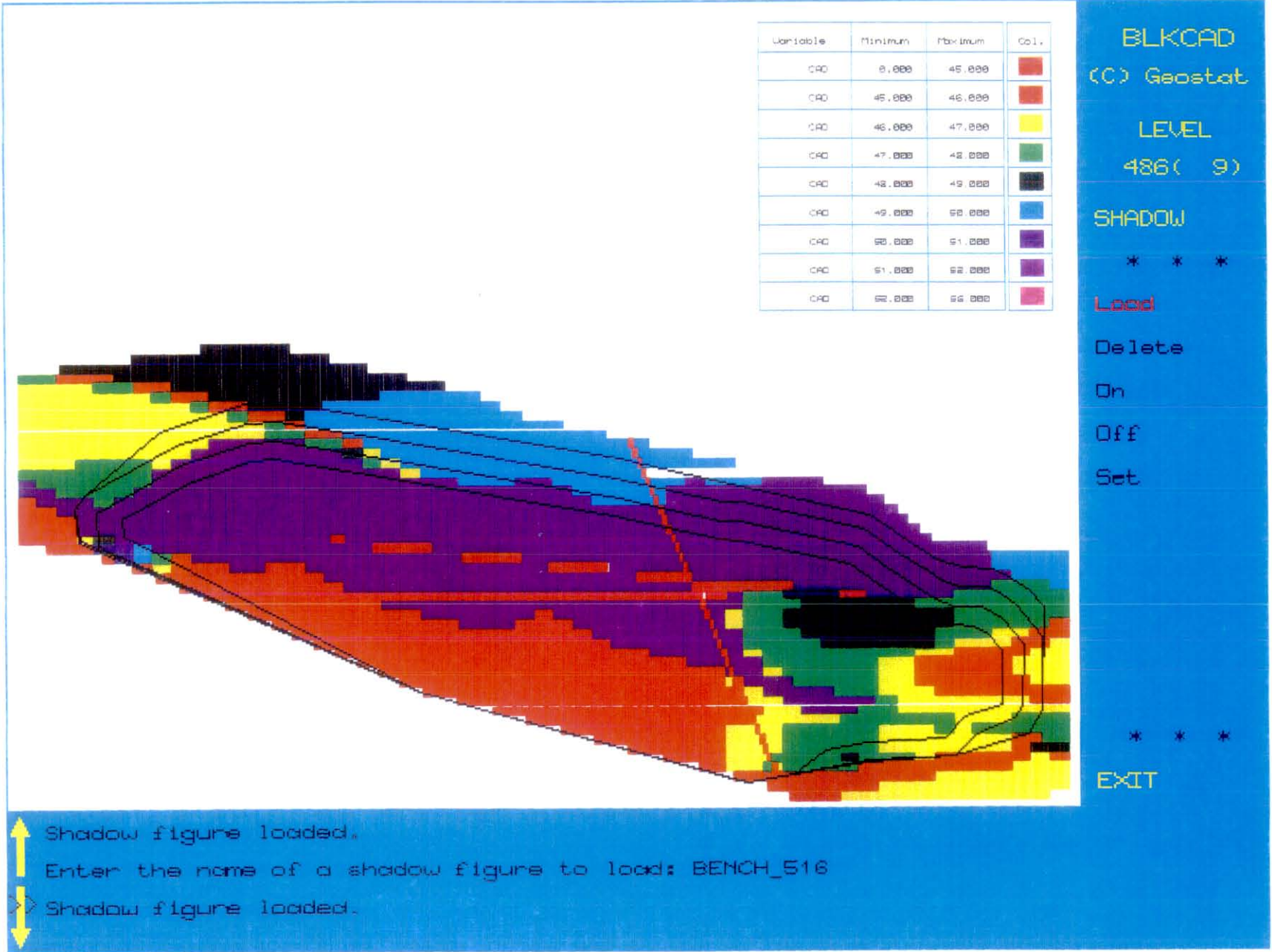


Figure 10



G.R.M.
CTS

Shadow figure loaded.
 Enter the name of a shadow figure to load: BENCH_516
 Shadow figure loaded.

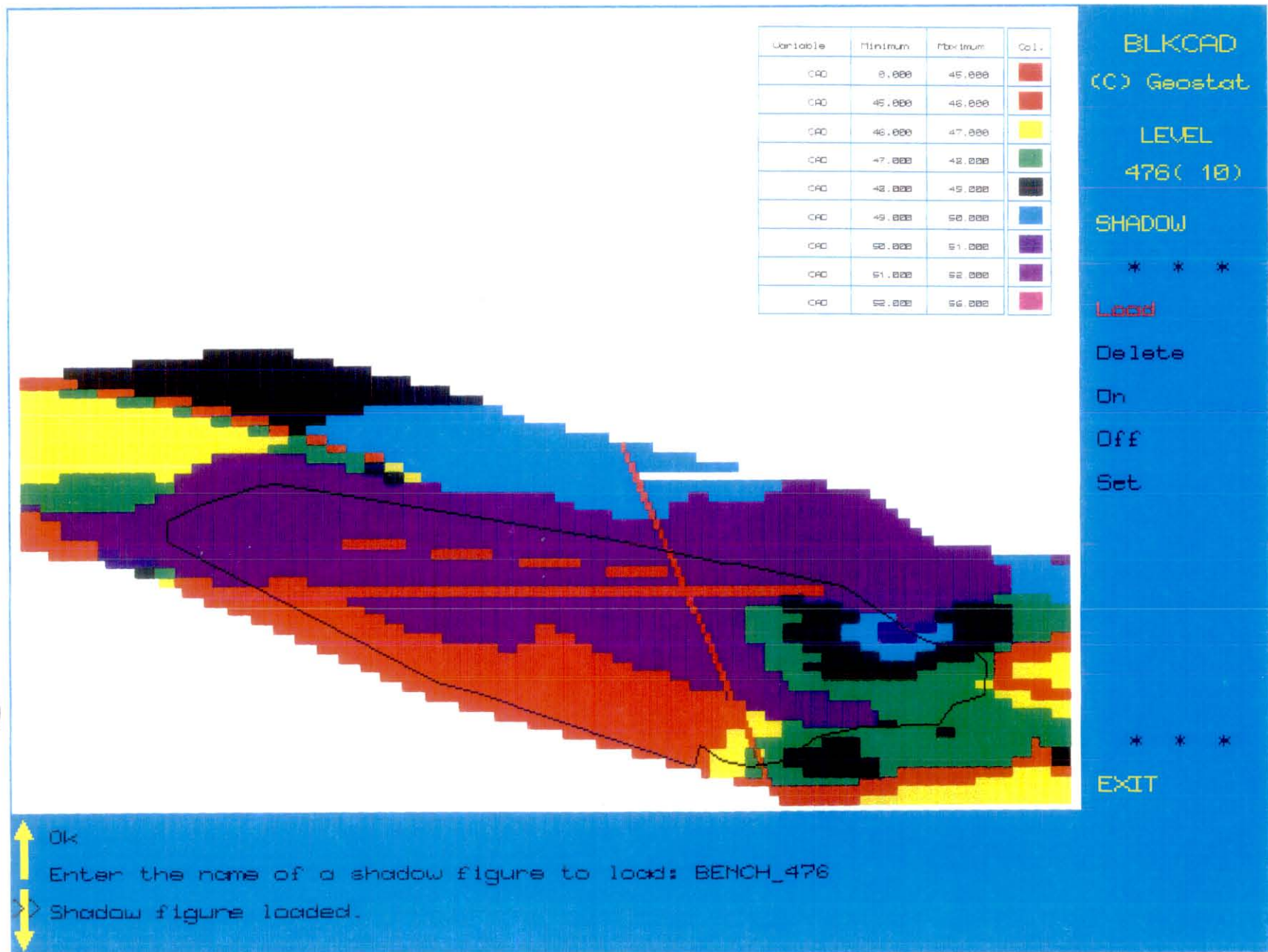


Figure 11



G.R.M.
CTS

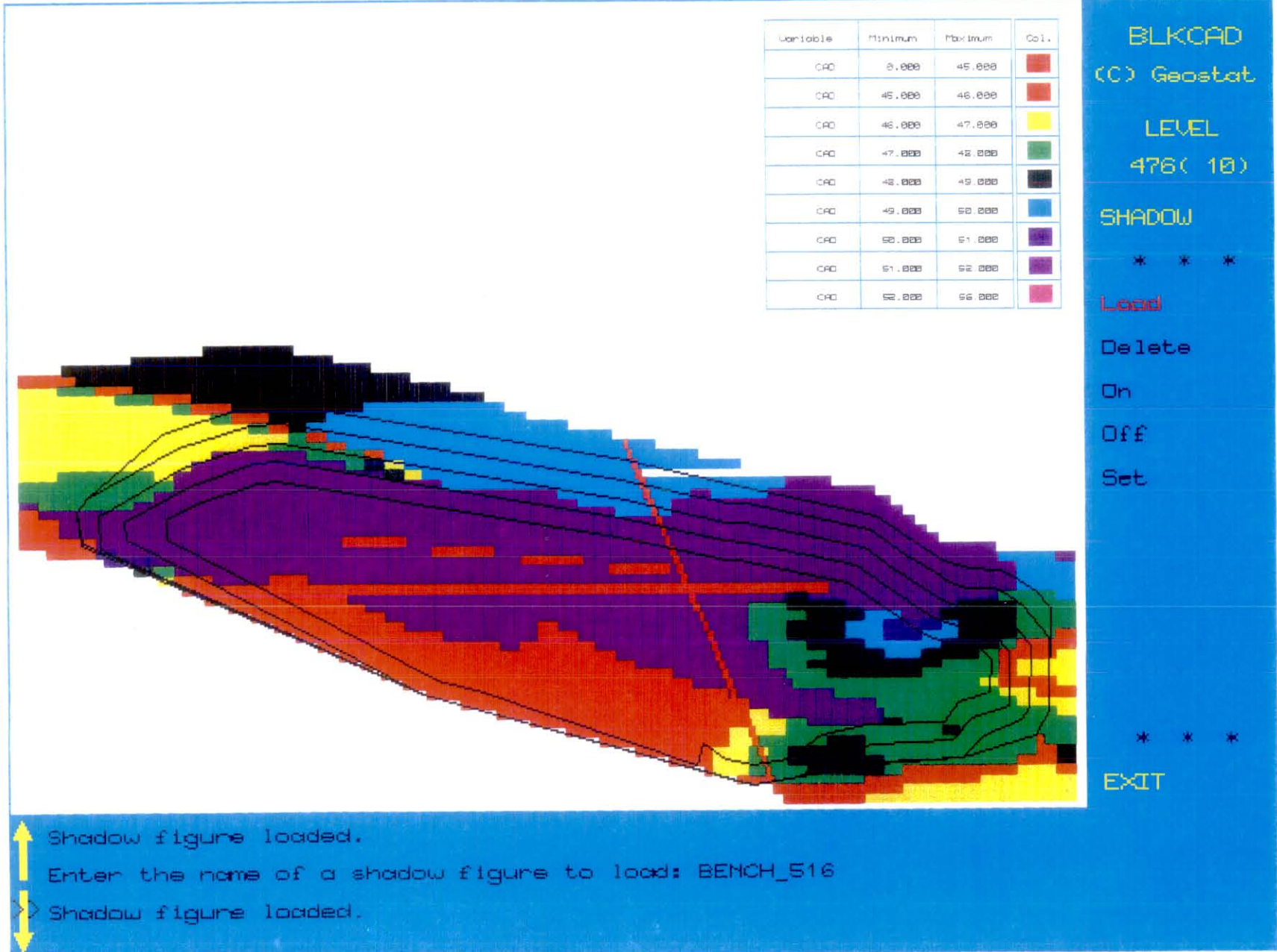


Figure 12



G.R.M.
CTS

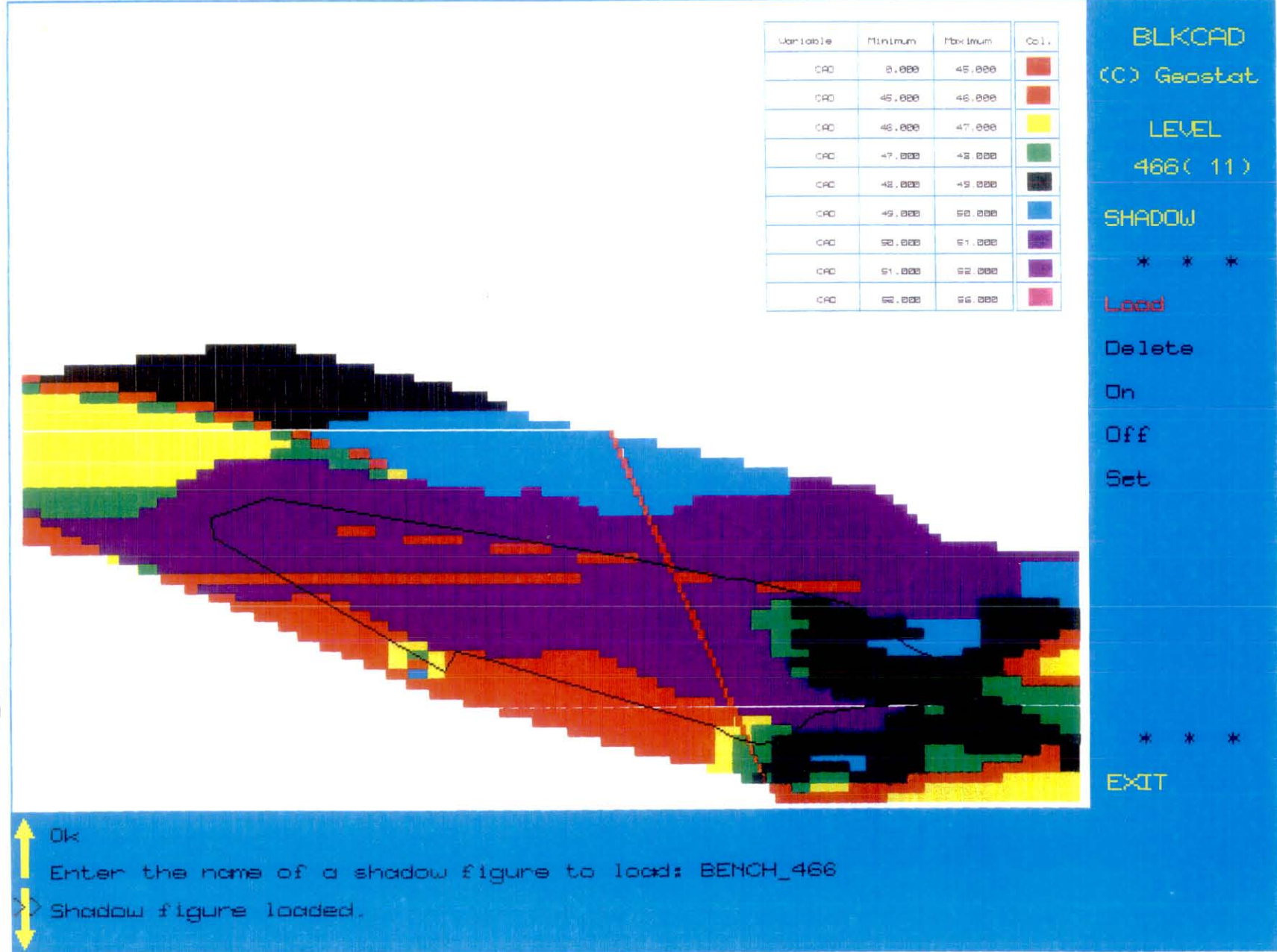


Figure 13



G.R.M.
CTS

↑ Ok
 Enter the name of a shadow figure to load: BENCH_466
 → Shadow figure loaded.

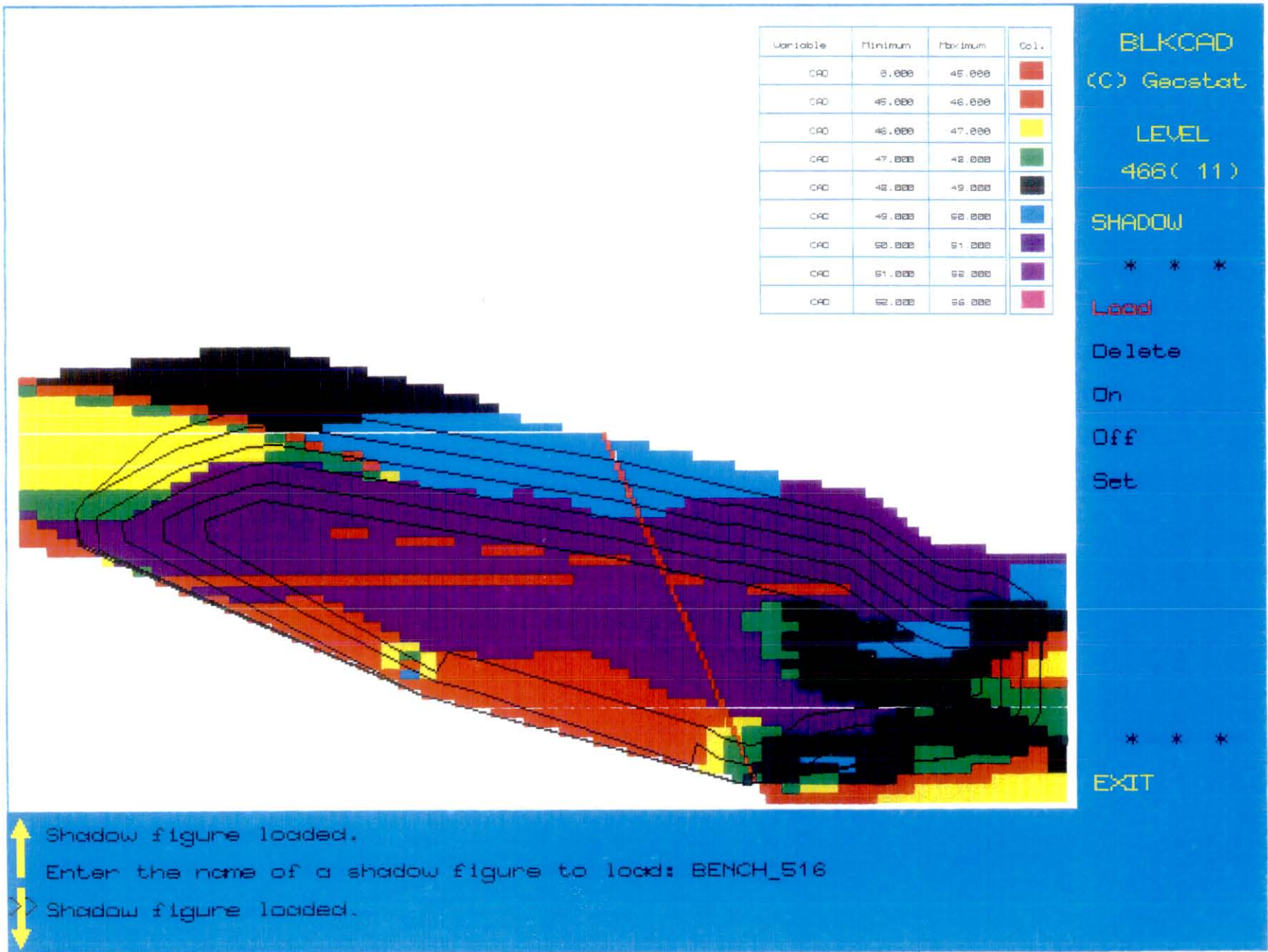


Figure 14



G.R.M.
CTS

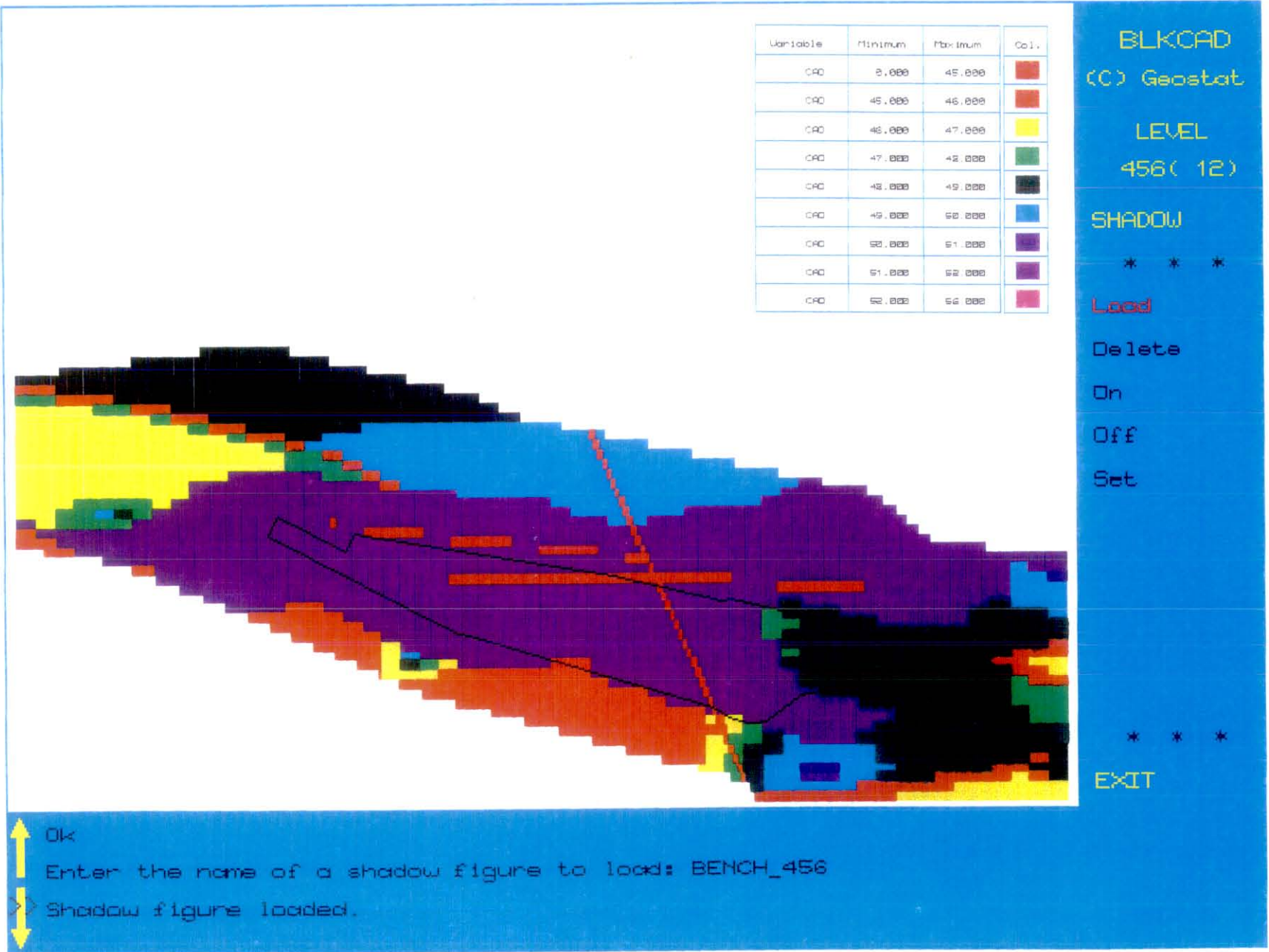


Figure 15



G.R.M.
CTS

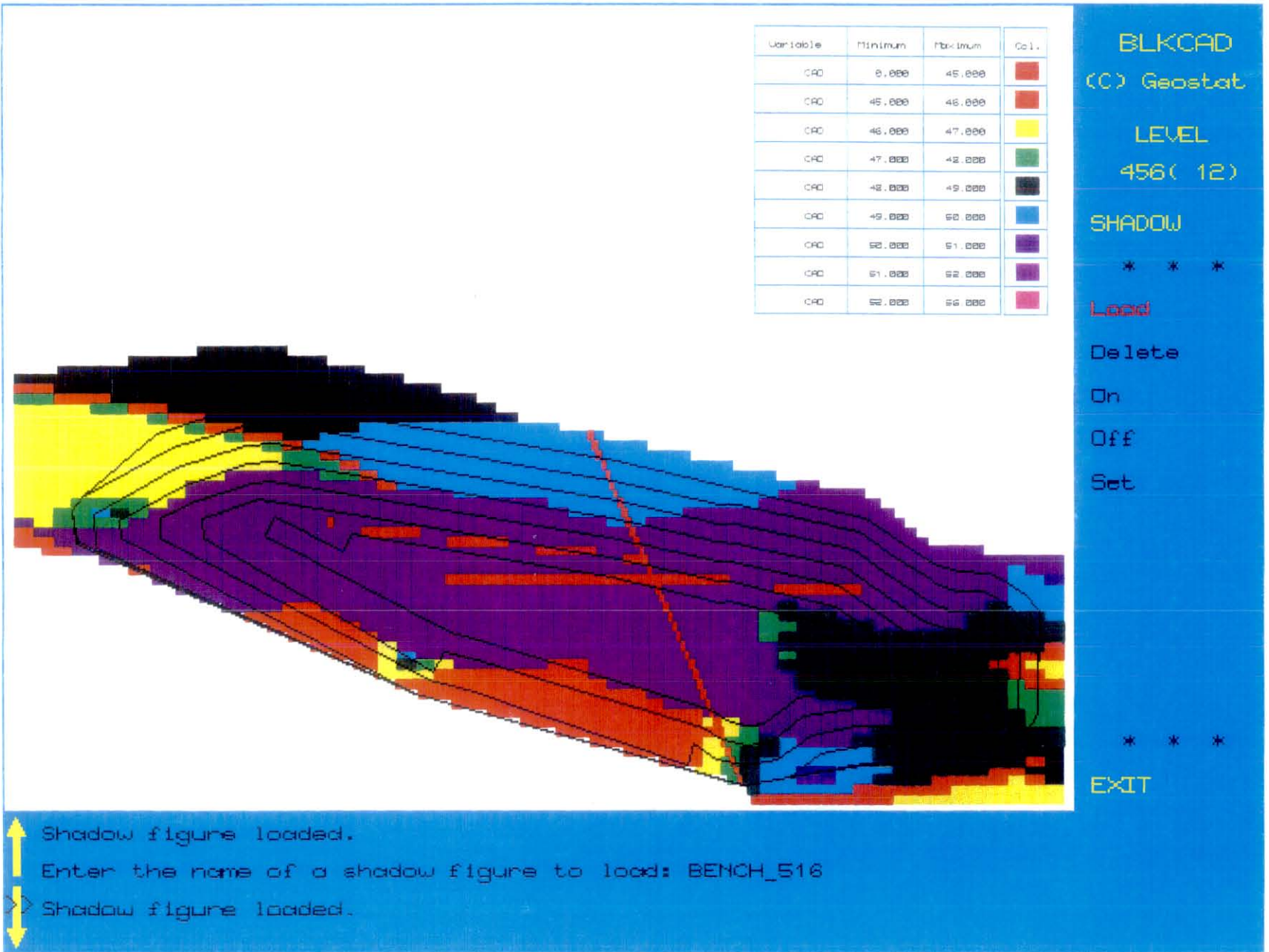


Figure 16



G.J.R.M.
C/MS

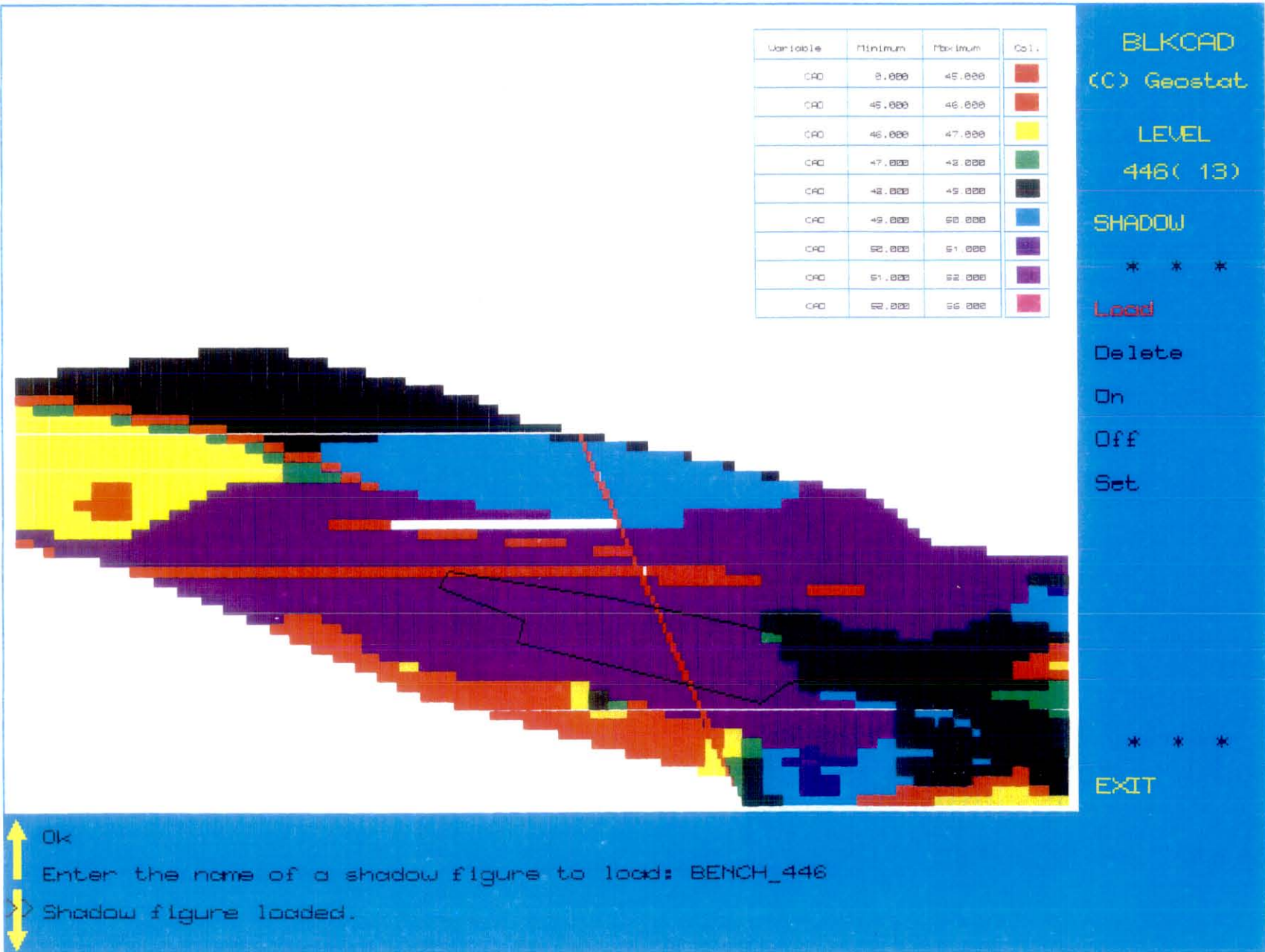


Figure 17



G.R.M.
C/S

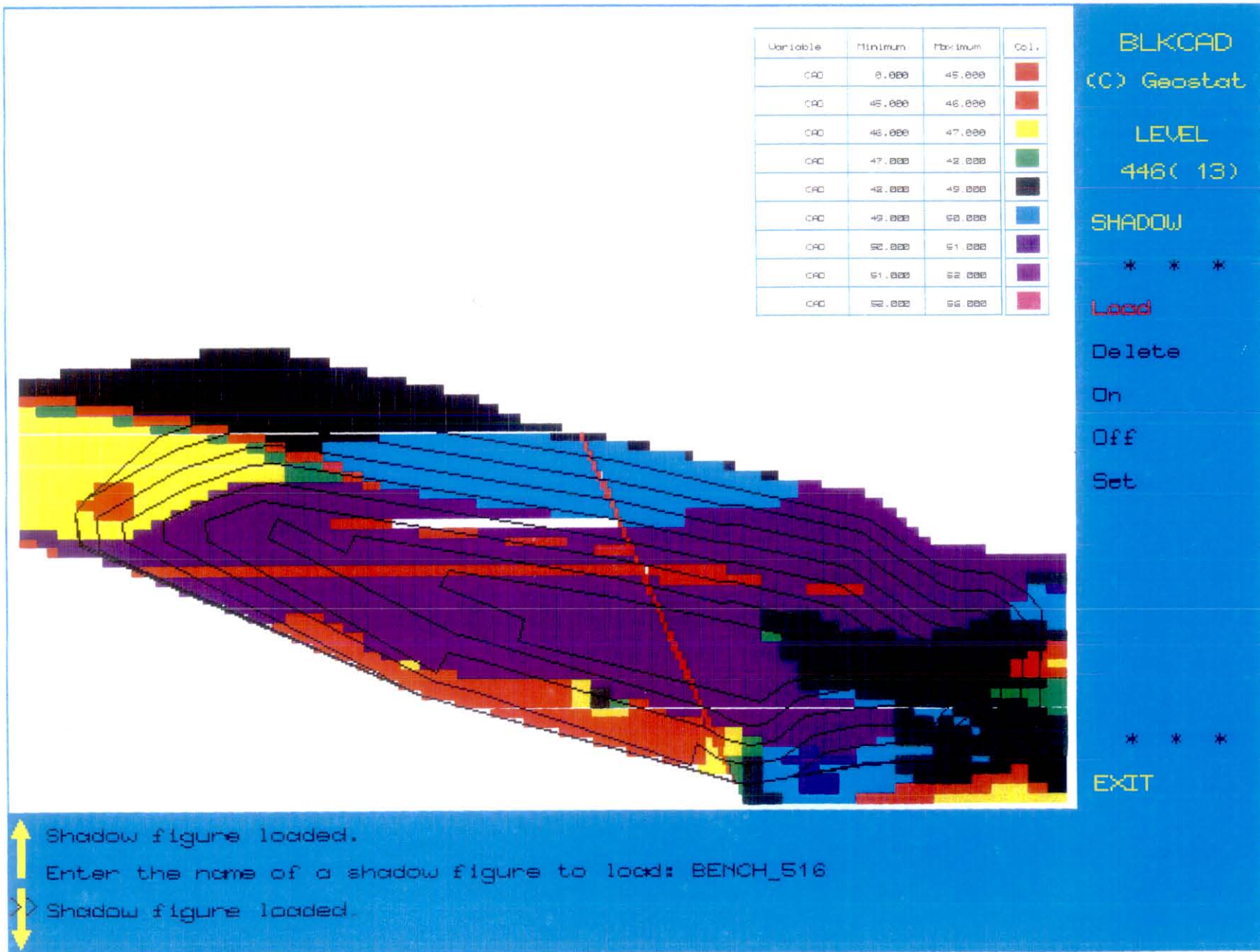


Figure 18



G.R.M.
CTS

3.3 Mining Implementation

3.3.1 BLASTCAD Design

The BLASTCAD model has been defined according to the following parameters:

- 1) Bench 516 has been added to Bench 506 because of the small thickness of the bench (~ 2 m maximum).
- 2) All other benches have been set according to the GENBLOCK model.
- 3) The GENBLAST limit for each bench has been used according to the quarry design. These limits are listed in Appendix 3.
- 4) The grid mesh used for BLASTCAD is 15 m in x and full face length in y .

With the BLASTCAD module of the QMS program, a new estimation has been done in the model for each bench according to the above parameters.

Figures 19 to 25 show the blast locations for each bench (Levels 7 to 13) and the colors represent variations in the CaO content.

In Appendix 5, the reserves chemical and tonnage analysis can be found for each blast of the bench. Also, the BLAST-BLOCKPLOT map for Benches 7 to 13 [in Appendix 6] shows the BLAST locations and chemical content for all elements within the bench.



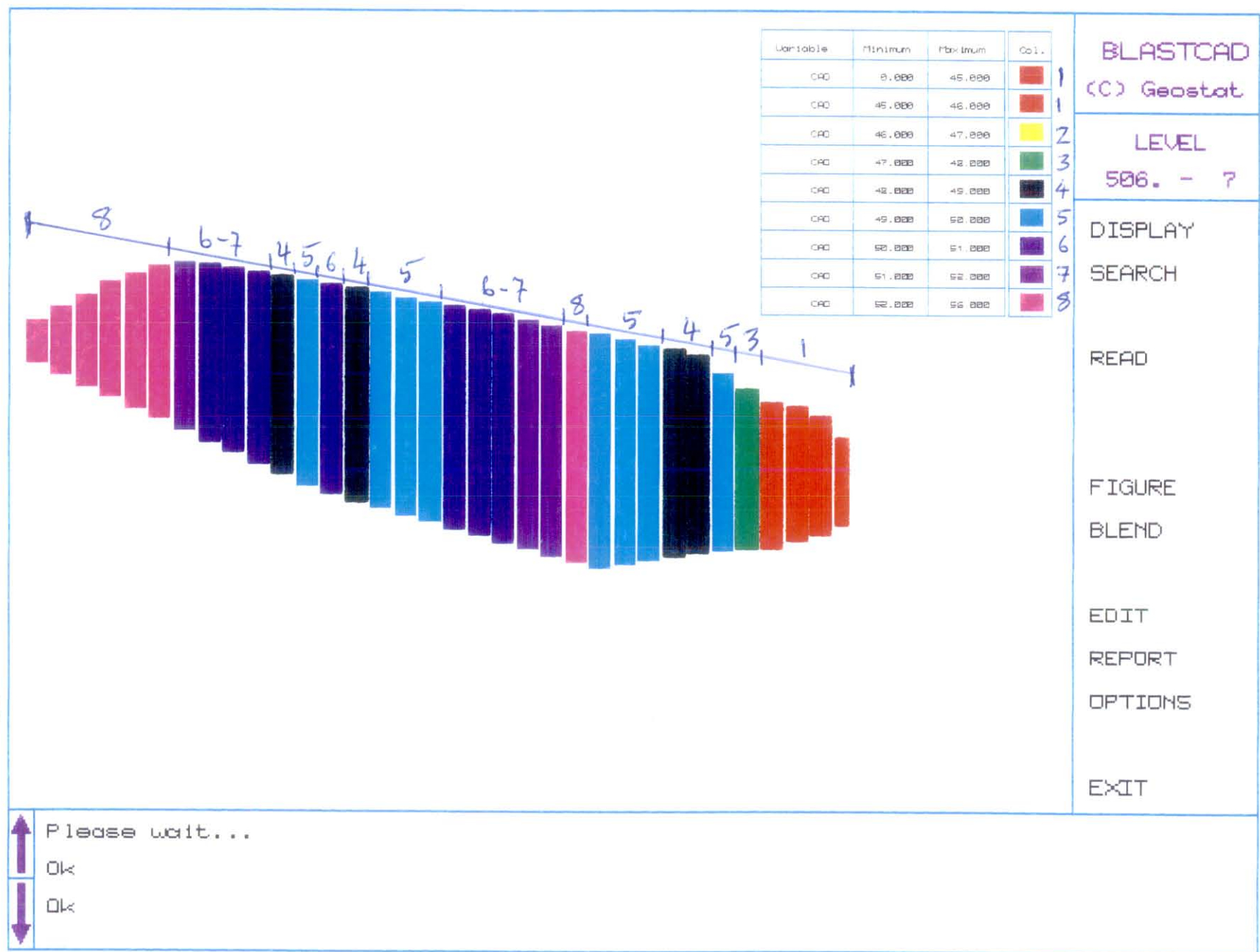


Figure 19



G.R.M.
C/PS

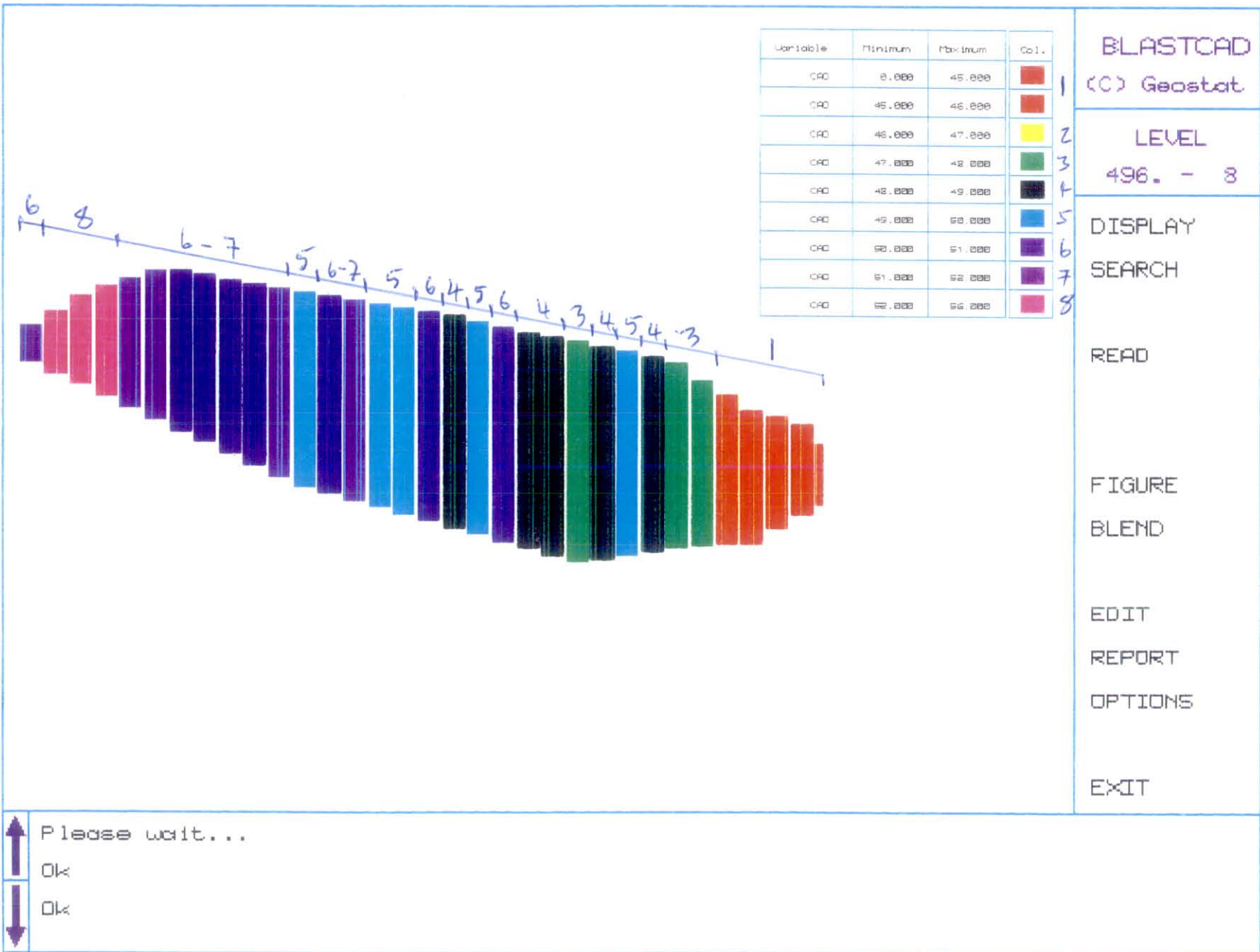


Figure 20



G.R.M.
CONSULTANTS

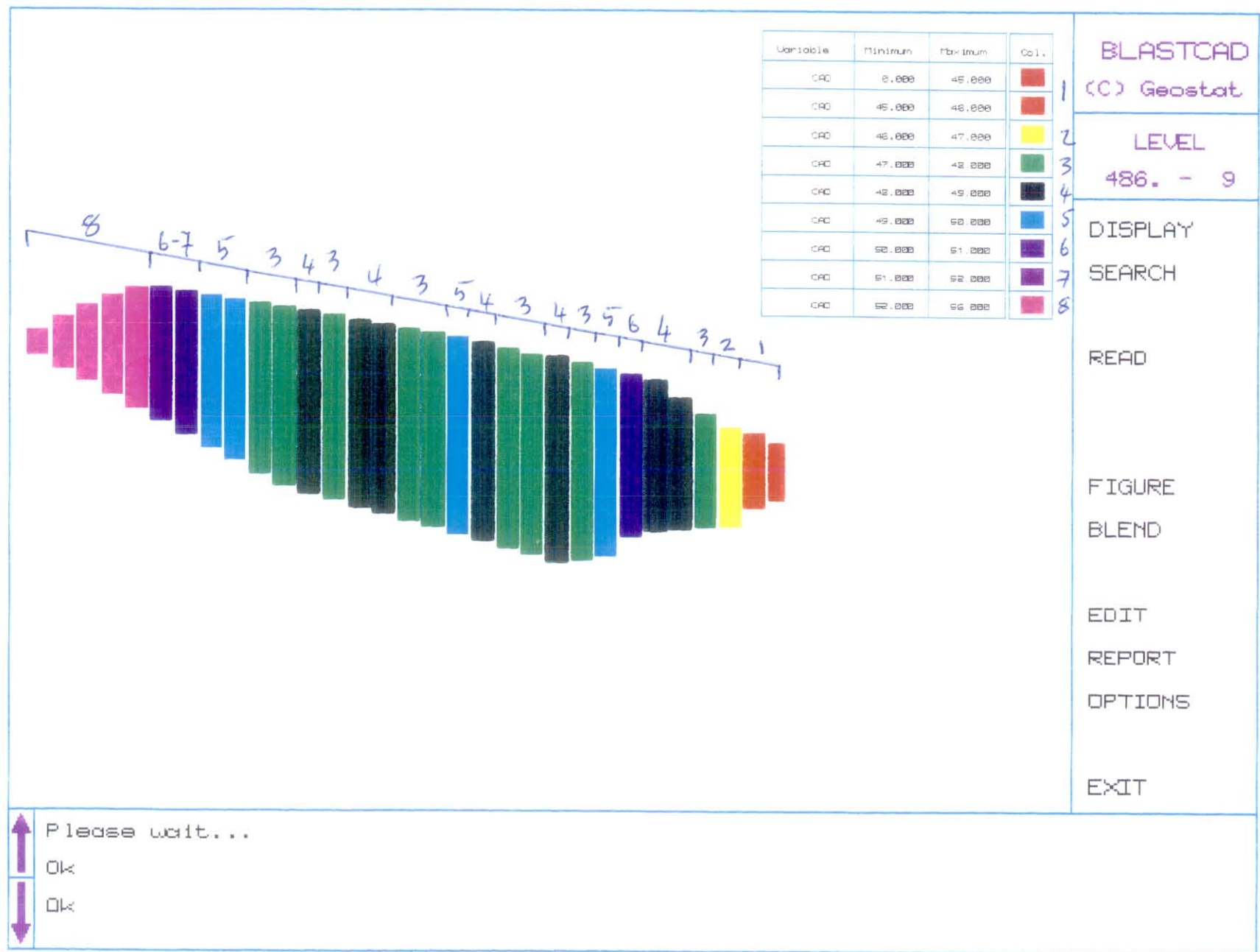


Figure 21



G.R.M.
C/RS

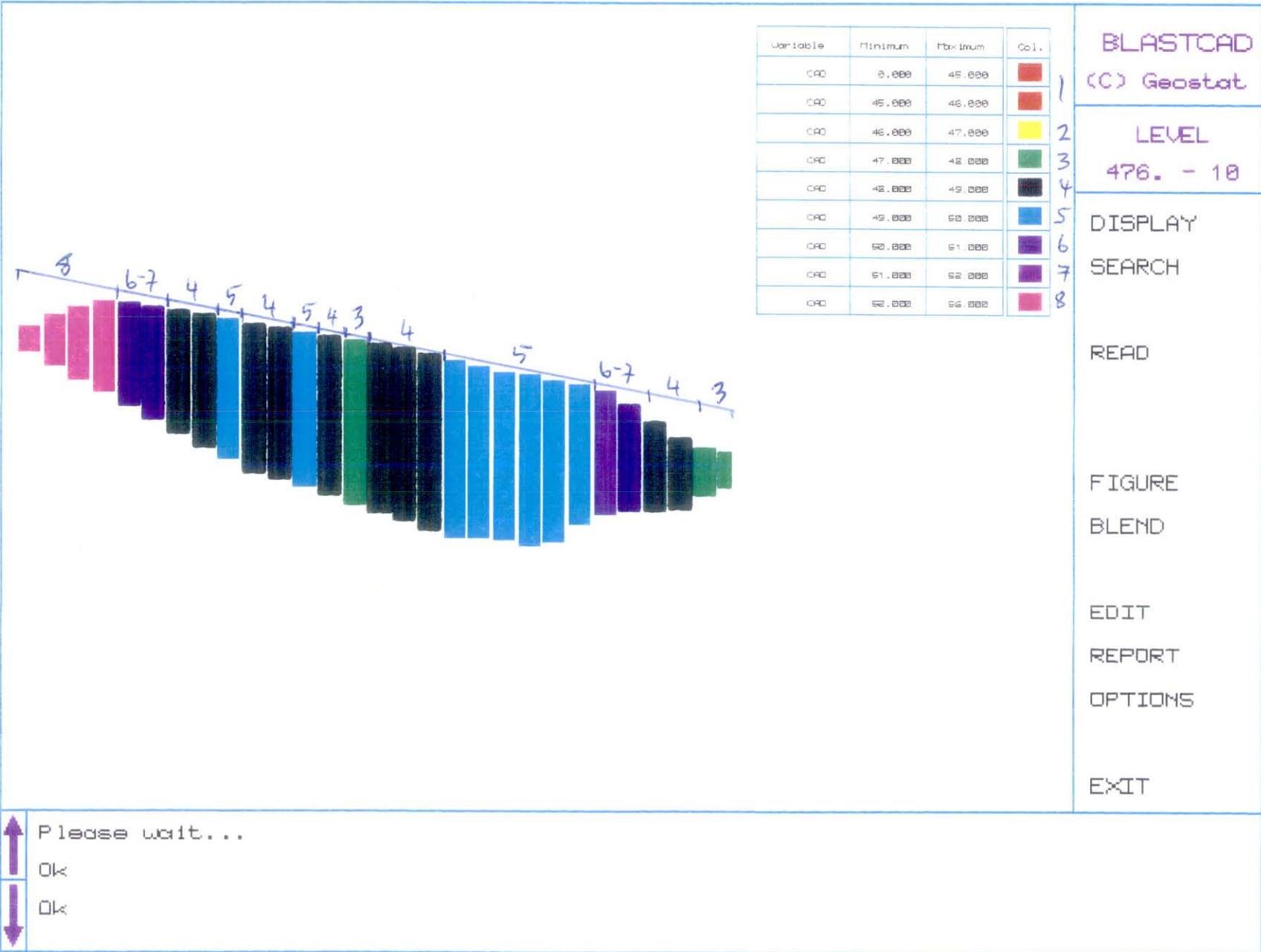


Figure 22



G.R.M.
CONSULTANTS

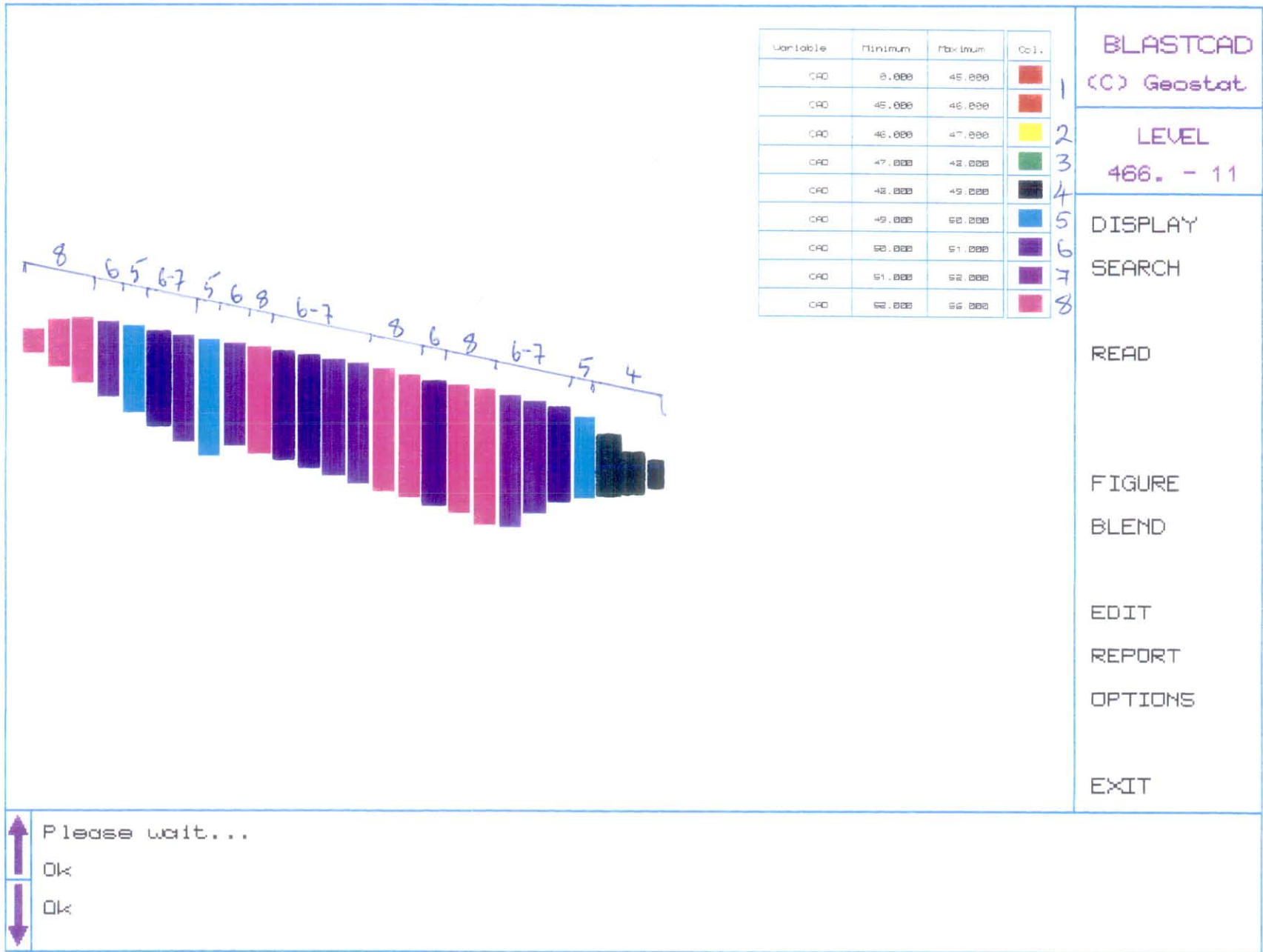


Figure 23



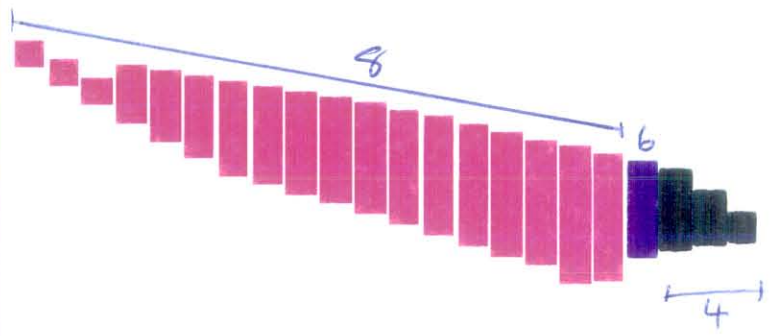
G.R.M.
CTS

BLASTCAD
 (C) Geostat

LEVEL
 456. - 12

DISPLAY
 SEARCH
 READ
 FIGURE
 BLEND
 EDIT
 REPORT
 OPTIONS
 EXIT

Variable	Minimum	Maximum	Col.
CAD	0.000	45.000	1
CAD	45.000	46.000	2
CAD	46.000	47.000	3
CAD	47.000	48.000	4
CAD	48.000	49.000	5
CAD	49.000	50.000	6
CAD	50.000	51.000	7
CAD	51.000	52.000	8



↑ Please wait...
 ↓ Ok
 ↓ Ok

Figure 24



Variable	Minimum	Maximum	Col.
CAD	8.000	45.000	1
CAD	45.000	46.000	2
CAD	46.000	47.000	3
CAD	47.000	48.000	4
CAD	48.000	49.000	5
CAD	49.000	50.000	6
CAD	50.000	51.000	7
CAD	51.000	52.000	8

BLASTCAD
(C) Geostat

LEVEL
446. - 13

DISPLAY
SEARCH
READ
FIGURE
BLEND
EDIT
REPORT
OPTIONS
EXIT

Please wait...
Ok
Ok

Figure 25



G.J.R.M.
CTS

3.3.2 Development Criteria

In order to develop this deposit as an economic source of high limestone for the Kamloops plant, several prerequisites had to be met.

- A mining method which conforms to the British Columbia 1992 Health, Safety and Reclamation Code must be developed.
- An acceptable reclamation plan must be developed and implemented, which is compatible with the quarrying method and severe topography.

3.3.2.1 Face Height and Stability

The final height of the working face of each bench will be 10 meters, except for Bench 506 which needs to be at 12 m, in order to have a base floor at Level 506 m. All benches should be mined in conformance to the B.C. Code.

The principal reason for having a 45° angle hanging and foot-wall is related to the structural complexity of the deposit. Depending on the position in the folds, the orientation and dip of the stratigraphical bedding of the limestone sequence is affected and very variable. For more details on the structural geology, refer to Volume 1, Section 2.3. Also, for the same reason and safety concern, all the ramps have been developed in the same side of the quarry.

The standard practice of scaling the faces to remove loose debris following a blast, coupled with the ten 10-meter catchment berms, will further enhance the excavation's integrity for a safe operation.



3.3.3 Implementation

Listed below are the basic steps required to bring the new mining plan into action while providing a supply of limestone to Kamloops plant.

3.3.3.1 Survey of Reference Point

In 1993, a series of control points have been surveyed in the limestone quarry (6 monuments listed as A93 to F93) and also a series of grid references, as shown in the photographs on the following pages and on the Mining Design Plan in Appendix 2. These points and alignment grid lines should be permanent and have their x , y , z coordinates marked on them for future use. With these surveyed control points, the quarry operator or another person in charge, must at all times control the elevation of the bench floor. Also, an update of the mining face should be done on a regular basis in order to control the mining development and raw mix design within the BLASTCAD model.

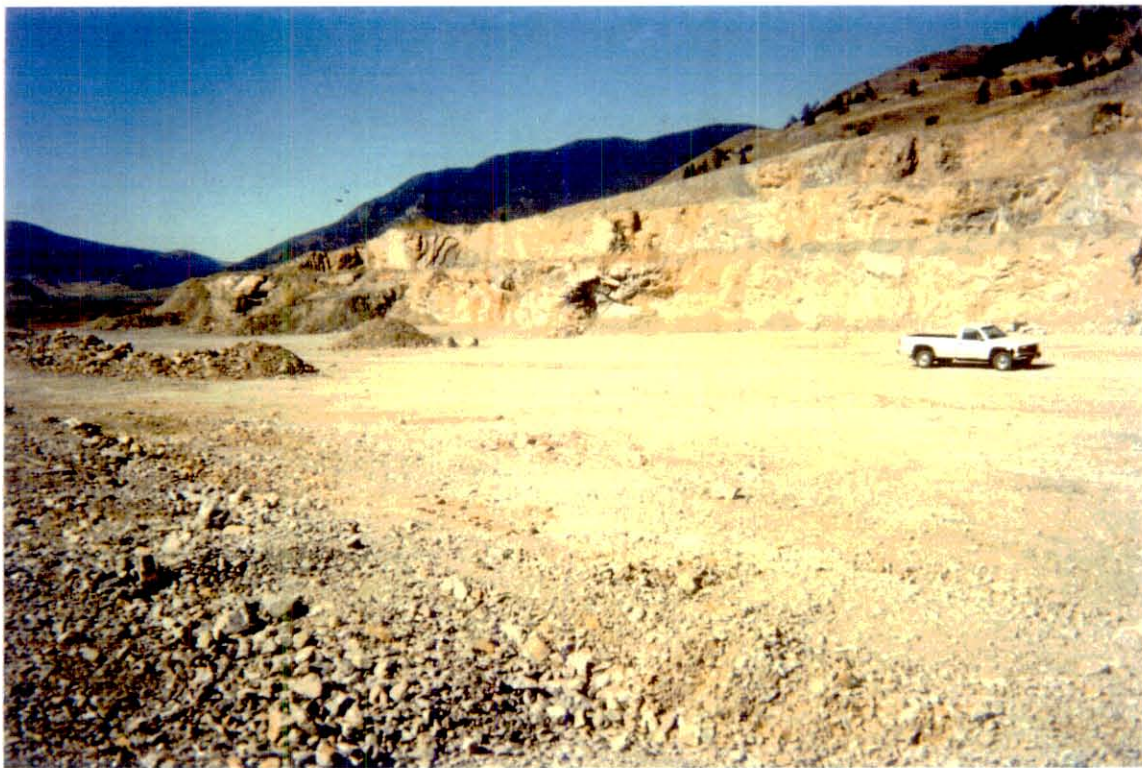
3.3.3.2 Improvement of the Main Ramp Access

Beginning in the spring of 1994, the eastern main haul ramp should be extended and widened to the south and safety berms should be constructed alongside; this should provide sufficient room in order to haul material from the 2-bench operation on the same side of the quarry [see map mining design]. In the development of the quarry, all ramps have been designed to a 12-meter width in order to provide sufficient room and safety for hauling.





View of Bench 506-516 (1993) Level 7



View of Top Bench 506-516, 516-526, 526-536 (1993)



G.R.M.
CTS



View of Grid Coordinate Alignment in the Limestone Quarry (1993)



G.R.M.
CTS

3.3.3.3 Step-by-Step Development with BLASTCAD

In Appendices 5 and 6, Plans and chemistry reports show the details and locations of each blast. This information, provided by the BLASTCAD module, can be used as a guideline and a tool for the development of the benches.

In order to correlate and validate this information during each stage of the development, the quarry operator will need to survey the location of each blast in the bench and associate the data from the blast hole sample with the BLAST-BLOCKPLOT map. This result will validate the chemistry of the blast. By using this method, the quarry operator is able to plan and predict in advance the composition of the blend required.

The BLASTCAD program can be easily installed at the plant and could be a powerful tool to control and validate the mining plan. Training and procedures can be supplied to the quarry operator in order to perform in the proper manner.



4. WATER MANAGEMENT

At this stage of the operation, it seems that any specific drainage control is necessary. If any rainwater runoff occurs, or an accumulation of water in a series of concentric basins on a bench floor, this situation can be avoided by maintaining the surface of each bench level with a slight outward slope driven to the ramp exit.

Therefore, once Bench 486 starts to be in production, it will be necessary to prevent any accumulation of water in the pit. At this stage, and only if water accumulation occurs, a sump pump could be necessary to collect all water runoff from the above surface. The type and size of the pump has to be determined as the situation develops. If a sump pump is proven essential, it will be imperative to build a settling pond, located as recommended on the map in Appendix 7, Final Quarry Design, in order to collect all the water runoff from the quarry. The settling pond must have a capacity for a maximum peak of 10 cm of rainfall over a 24-hour period.



5. CONCLUSION AND RECOMMENDATION

The proven limestone reserves outlined in this report constitute an amount adequate for 23 years of production, assuming consumption of 260,000 tonnes per year of limestone. The raw mix design can be discussed and examined in further detail in a supplementary report. Modification to the raw mix design or production increment could affect the life of the quarry.

In order to increase our proven reserve to secure a minimum of 50 years, we should consider the following options:

- During the upcoming mine planning stage, analyses of the raw mix design, notably looking at the possibility of using the overburden or silt material as a complement to the siliceous limestone.
- Research the possibility of securing an additional limestone reserve in the eastern and northern extension of the actual pit.

In either case, additional diamond drill or test holes will be needed to define the chemistry of the material. To define chemistry in the eastern end of the east pit will require 200 m to 300 m of drilling; and the northern area, defined by the northwestern foot-wall of the actual pit, would require a minimum of 100 m drilling to define possible "geologically inferred" reserves.

More specific considerations on drainage, topsoil and overburden will be discussed in more detail in Volume 3 (Reclamation Plan).



APPENDIX 1

**GENBLOCK STATISTICAL REPORT
ROCK TYPES 1 TO 9**

GENBLK STATISTICAL REPORT

KAMLOOPS QUARRY BC. 1993

ROCK TYPE 1

22-MAR-93

QMSCREGB 22-MAR-1993

PAGE 1.0

Title: KAMLOOPS QUARRY BC. 1993

Limits of bench Minimum: 446.00 Maximum: 576.00
Height of benches: 10.00

Limits of lines Y Minimum: 3200.00 Maximum: 3480.00
Width of blocks : 5.00

Limits of columns X ... Minimum: 1600.00 Maximum: 2200.00
Length of blocks: 10.00

First bench number: 1
Density (metric tons): 2.6400

Top topographic limit is use.
Compute topo grid.

Number of external envelope: 1

GENBLK STATISTICAL REPORT

KAMLOOPS QUARRY BC. 1993

22-MAR-93
QMBCREGB 22-MAR-1993
PAGE 20

The external envelope # 1 have 14 planes.

No	Plane	Name	X	Y	Z	Asimuth	Dip
1	4	PLAN#4					
		First point :	1914.27	3437.15	498.86	12.35	90.00
		Second point:	2098.37	3396.84	498.86		
		Third point :	2098.37	3396.84	400.00		
2	15	PLAN#15					
		First point :	2098.37	3396.84	498.86	38.51	90.00
		Second point:	2133.56	3368.84	498.86		
		Third point :	2133.56	3368.84	400.00		
3	16	PLAN#16					
		First point :	2133.56	3368.84	498.86	3.11	90.00
		Second point:	2200.00	3365.23	498.86		
		Third point :	2200.00	3365.23	400.00		
4	20	PLAN#20					
		First point :	2201.00	3365.23	498.86	-89.34	90.00
		Second point:	2199.50	3235.11	498.86		
		Third point :	2199.50	3235.11	400.00		
5	31	PLAN#31					
		First point :	2028.93	3304.04	498.86	192.94	87.00
		Second point:	2200.00	3264.72	498.86		
		Third point :	2030.09	3298.45	400.00		
6	10	PLAN#10					
		First point :	2057.74	3238.10	498.86	66.40	61.93
		Second point:	1943.38	3499.85	498.86		
		Third point :	1851.74	3459.81	311.33		
7	17	PLAN#17					
		First point :	1743.63	3339.56	498.86	0.36	70.00
		Second point:	2011.80	3337.86	498.86		
		Third point :	2012.43	3437.86	224.11		

**GENBLK STATISTICAL REPORT
KAMLOOPS QUARRY BC. 1993**

22-MAR-93 QMPCREGB 22-MAR-1993 PAGE 10

No	Plane	Name	X	Y	Z	Asimuth	Dip
8	5	PLAN#5					
		First point :	2021.80	3337.80	498.86	-90.00	90.00
		Second point:	2021.80	3341.86	498.86		
		Third point :	2021.80	3341.86	400.00		
9	19	PLAN#19					
		First point :	1735.26	3343.63	498.86	0.35	70.00
		Second point:	2010.02	3341.93	498.86		
		Third point :	2010.64	3441.93	224.11		
10	10	PLAN#10					
		First point :	2057.74	3238.10	498.86	66.40	61.93
		Second point:	1943.38	3499.85	498.86		
		Third point :	1851.74	3459.81	311.33		
11	6	PLAN#6					
		First point :	2010.51	3346.20	498.86	3.70	84.35
		Second point:	2093.82	3340.81	498.86		
		Third point :	2097.00	3346.04	443.99		
12	7	PLAN#7					
		First point :	2093.82	3340.81	498.86	-90.00	90.00
		Second point:	2093.82	3344.27	498.86		
		Third point :	2093.82	3344.27	400.00		
13	8	PLAN#8					
		First point :	2008.95	3349.76	498.86	3.70	84.35
		Second point:	2093.82	3344.27	498.86		
		Third point :	2097.00	3349.50	443.99		
14	10	PLAN#10					
		First point :	2057.74	3238.10	498.86	66.40	61.93
		Second point:	1943.38	3499.85	498.86		
		Third point :	1851.74	3459.81	311.33		

GENBLK STATISTICAL REPORT
KAMLOOPS QUARRY BC. 1993

23-MAR-93 QMSCREEN 23-MAR-1993 PAGE 40

The rock type # 3 have 1 bottom file.

The rock type # 9 have 1 top file.
The rock type # 9 have 1 bottom file.

The rock type # 7 have 1 top file.
The rock type # 7 have 1 bottom file.

The rock type # 1 have 1 top file.
The rock type # 1 have 1 bottom file.

The rock type # 2 have 1 top file.

Topo estimated at 3360 grid points
3031 grid points estimated by cell average
329 grid points estimated by ISD with:
a maximum of 5 closest controls
in a search zone of size = 26.46

Topo estimated at 3360 grid points
173 grid points estimated by cell average
1155 grid points estimated by ISD with:
a maximum of 5 closest controls
in a search zone of size = 134.53

Topo estimated at 3360 grid points
210 grid points estimated by cell average
1108 grid points estimated by ISD with:
a maximum of 5 closest controls
in a search zone of size = 126.57

Topo estimated at 3360 grid points
2095 grid points estimated by cell average
613 grid points estimated by ISD with:
a maximum of 5 closest controls
in a search zone of size = 38.74

Topo estimated at 3360 grid points
1000 grid points estimated by cell average
786 grid points estimated by ISD with:
a maximum of 5 closest controls
in a search zone of size = 53.10

GENBLK STATISTICAL REPORT
KAMLOOPS QUARRY BC. 1993

22-MAR-93

QMSCREEN 22-MAR-1993

PAGE 80

Total for each bench:	BLOCK	TONNAGE
Bench # 1 (576.00 - 566.00)	0	0.00
Bench # 2 (566.00 - 556.00)	0	0.00
Bench # 3 (556.00 - 546.00)	0	0.00
Bench # 4 (546.00 - 536.00)	0	0.00
Bench # 5 (536.00 - 526.00)	36	11139.05
Bench # 6 (526.00 - 516.00)	139	84634.83
Bench # 7 (516.00 - 506.00)	413	247954.90
Bench # 8 (506.00 - 496.00)	462	516898.91
Bench # 9 (496.00 - 486.00)	459	527391.32
Bench #10 (486.00 - 476.00)	468	549018.46
Bench #11 (476.00 - 466.00)	489	579537.86
Bench #12 (466.00 - 456.00)	512	605963.61
Bench #13 (456.00 - 446.00)	524	620795.78
Total (576.00 - 446.00)	3502	3743334.72

GENBLK STATISTICAL REPORT

KAMLOOPS QUARRY BC. 1993

17-MAR-93

QMBORISB 17-MAR-1993

PAGE 10

ROCK TYPE 2, 3, 4

Title: KAMLOOPS QUARRY BC. 1993

Limits of bench Minimum: 446.00 Maximum: 576.00

Height of benches: 10.00

Limits of lines Y Minimum: 3200.00 Maximum: 3480.00

Width of blocks : 5.00

Limits of columns X ... Minimum: 1600.00 Maximum: 2200.00

Length of blocks: 10.00

First bench number: 1

Density (metric tons): 2.6400

Top topographic limit is use.

Compute topo grid.

Number of external envelope: 3

GENBLK STATISTICAL REPORT

KAMLOOPS QUARRY BC. 1993

17-MAR-93 09:23:23 17-MAR-1993 PAGE 20

The external envelope # 1 have 4 planes.

No	Plane	Name	X	Y	Z	Asimuth	Dip
1	31	PLAN#31					
		First point :	2028.93	3304.04	498.86	192.94	87.00
		Second point:	2200.00	3264.72	498.86		
		Third point :	2030.09	3298.45	400.00		
2	20	PLAN#20					
		First point :	2200.00	3365.23	498.86	90.00	90.00
		Second point:	2200.00	3235.11	498.86		
		Third point :	2200.00	3235.11	400.00		
3	24	PLAN#24					
		First point :	2200.00	3235.11	498.86	-0.09	90.00
		Second point:	2070.00	3234.90	498.86		
		Third point :	2070.00	3234.90	400.00		
4	10	PLAN#10					
		First point :	2057.74	3238.10	498.86	66.40	61.93
		Second point:	1943.38	3499.85	498.86		
		Third point :	1851.74	3459.81	311.33		

GENBLK STATISTICAL REPORT

KAMLOOPS QUARRY BC. 1993

17-MAR-93 QMSCR00B 17-MAR-1993 PAGE 30

The external envelope # 2 have 6 planes.

No	Plane	Name	X	Y	Z	Asimuth	Dip
1	17	PLAN#17					
		First point :	1743.63	3339.56	498.86	0.36	70.00
		Second point:	2011.80	3337.86	498.86		
		Third point :	2012.43	3437.86	224.11		
2	11	PLAN#11					
		First point :	2055.36	3238.15	498.86	66.40	61.93
		Second point:	1941.16	3499.55	498.86		
		Third point :	1849.52	3459.52	311.34		
3	25	PLAN#25					
		First point :	2070.00	3234.90	498.86	15.37	90.00
		Second point:	1960.00	3265.13	498.86		
		Third point :	1960.00	3265.13	400.00		
4	26	PLAN#26					
		First point :	1960.00	3265.13	498.86	15.51	90.00
		Second point:	1860.00	3292.88	498.86		
		Third point :	1860.00	3292.88	400.00		
5	27	PLAN#27					
		First point :	1860.00	3292.88	498.86	24.01	90.00
		Second point:	1775.00	3330.74	498.86		
		Third point :	1775.00	3330.74	400.00		
6	28	PLAN#28					
		First point :	1775.00	3330.74	498.86	22.23	90.00
		Second point:	1700.00	3361.40	498.86		
		Third point :	1700.00	3361.40	400.00		

GENBLK STATISTICAL REPORT
KAMLOOPS QUARRY BC. 1993

17-MAR-93 QMSCHRG 17-MAR-1993 PAGE 40

The external envelope # 3 have 13 planes.

No	Plane	Name	X	Y	Z	Arimuth	Dip
1	1	PLAN#1					
		First point :	1650.00	3459.48	498.86	-7.74	90.00
		Second point:	1776.19	3476.63	498.86		
		Third point :	1776.19	3476.63	400.00		
2	2	PLAN#2					
		First point :	1776.19	3476.63	498.86	13.85	90.00
		Second point:	1889.60	3448.66	498.86		
		Third point :	1889.60	3448.66	400.00		
3	3	PLAN#3					
		First point :	1889.60	3448.66	498.86	25.01	90.00
		Second point:	1914.27	3437.15	498.86		
		Third point :	1914.27	3437.15	400.00		
4	4	PLAN#4					
		First point :	1914.27	3437.15	498.86	12.35	90.00
		Second point:	2098.37	3396.84	498.86		
		Third point :	2098.37	3396.84	400.00		
5	11	PLAN#11					
		First point :	2055.36	3238.15	498.86	66.40	61.93
		Second point:	1941.16	3499.55	498.86		
		Third point :	1849.52	3459.52	311.34		
6	21	PLAN#21					
		First point :	1814.19	3370.74	498.86	6.20	72.50
		Second point:	2006.57	3349.83	498.86		
		Third point :	2017.38	3449.24	181.71		
7	23	PLAN#23					
		First point :	1814.19	3367.32	498.86	-90.00	90.00
		Second point:	1814.19	3370.74	498.86		
		Third point :	1814.19	3370.74	400.00		

GENBLK STATISTICAL REPORT

KAMLOOPS QUARRY BC. 1993

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QMBUREGB 17-MAR-1993
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No	Plane	Name	X	Y	Z	Asimuth	Dip
8	22	PLAN#22					
		First point :	1814.19	3367.32	498.86	6.20	72.50
		Second point:	2008.13	3346.26	498.86		
		Third point :	2018.93	3445.68	181.69		
9	11	PLAN#11					
		First point :	2055.36	3238.15	498.86	66.40	61.93
		Second point:	1941.16	3499.55	498.86		
		Third point :	1849.52	3459.52	311.34		
10	19	PLAN#19					
		First point :	1735.26	3343.63	498.86	0.35	70.00
		Second point:	2010.02	3341.93	498.86		
		Third point :	2010.64	3441.93	224.11		
11	28	PLAN#28					
		First point :	1775.00	3330.74	498.86	22.23	90.00
		Second point:	1700.00	3361.40	498.86		
		Third point :	1700.00	3361.40	400.00		
12	29	PLAN#29					
		First point :	1700.00	3361.40	498.86	9.76	90.00
		Second point:	1650.00	3370.00	498.86		
		Third point :	1650.00	3370.00	400.00		
13	30	PLAN#30					
		First point :	1650.00	3370.00	498.86	-90.00	90.00
		Second point:	1650.00	3459.48	498.96		
		Third point :	1650.00	3459.48	400.00		

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The rock type # 3 have 1 bottom file.

The rock type # 9 have 1 top file.
The rock type # 9 have 1 bottom file.

The rock type # 7 have 1 top file.
The rock type # 7 have 1 bottom file.

The rock type # 1 have 1 top file.
The rock type # 1 have 1 bottom file.

The rock type # 2 have 1 top file.

Topo estimated at 3360 grid points
3031 grid points estimated by cell average
329 grid points estimated by ISD with:
a maximum of 5 closest controls
in a search zone of size = 26.46

Topo estimated at 3360 grid points
1000 grid points estimated by cell average
786 grid points estimated by ISD with:
a maximum of 5 closest controls
in a search zone of size = 53.10

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External envelope # 1	BLOCK	TONNAGE
Rock Type# 3	37	43800.21
Rock Type# 9	27	25639.42
Rock Type# 7	92	99464.64
Rock Type# 1	41	41338.49

Bench #10 (486.00 - 476.00)	197	210242.77
Rock Type# 3	31	37579.07
Rock Type# 9	24	21162.32
Rock Type# 7	92	107311.40
Rock Type# 1	49	52496.76

Bench #11 (476.00 - 466.00)	196	218549.56
Rock Type# 3	26	30876.12
Rock Type# 9	21	16194.81
Rock Type# 7	101	115194.45
Rock Type# 1	60	64564.30

Bench #12 (466.00 - 456.00)	208	226829.67
Rock Type# 3	22	25182.43
Rock Type# 9	14	12979.56
Rock Type# 7	101	116055.92
Rock Type# 1	73	81095.76

Bench #13 (456.00 - 446.00)	210	235313.67

Total (576.00 - 446.00)	1224	1229854.80

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External envelope # 2	BLOCK	TONNAGE
Bench # 1 (576.00 - 566.00)	0	0.00
Bench # 2 (566.00 - 556.00)	0	0.00
Bench # 3 (556.00 - 546.00)	0	0.00
Bench # 4 (546.00 - 536.00)	0	0.00
Bench # 5 (536.00 - 526.00)	0	0.00
Rock Type# 7	57	11928.23
Rock Type# 1	11	1879.25

Bench # 6 (526.00 - 516.00)	68	13807.48
Rock Type# 7	152	135101.91
Rock Type# 1	38	27786.32

Bench # 7 (516.00 - 506.00)	190	162888.23
Rock Type# 9	1	75.80
Rock Type# 7	228	234310.24
Rock Type# 1	61	61713.33

Bench # 8 (506.00 - 496.00)	290	296099.38
Rock Type# 9	13	3888.24
Rock Type# 7	236	261148.75
Rock Type# 1	92	97139.74

Bench # 9 (496.00 - 486.00)	341	362176.73

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KAMLOOPS QUARRY BC. 1993

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External envelope # 3	BLOCK	TONNAGE
-----	-----	-----
Rock Type# 3	18	13143.89
Rock Type# 9	11	6833.75
Rock Type# 7	47	44717.97
Rock Type# 1	395	472710.52
Rock Type# 2	341	409574.55
-----	-----	-----
Bench # 9 (496.00 - 486.00)	812	946980.68
-----	-----	-----
Rock Type# 3	15	12033.67
Rock Type# 9	4	2152.63
Rock Type# 7	23	18639.58
Rock Type# 1	344	416483.63
Rock Type# 2	364	450212.48
-----	-----	-----
Bench #10 (486.00 - 476.00)	750	899521.99
-----	-----	-----
Rock Type# 3	14	11195.94
Rock Type# 9	1	73.20
Rock Type# 7	12	8330.46
Rock Type# 1	297	365029.22
Rock Type# 2	382	474880.42
-----	-----	-----
Bench #11 (476.00 - 466.00)	706	859509.25
-----	-----	-----
Rock Type# 3	14	10427.82
Rock Type# 7	5	4174.33
Rock Type# 1	271	327139.27
Rock Type# 2	405	498633.95
-----	-----	-----
Bench #12 (466.00 - 456.00)	695	840375.38
-----	-----	-----
Rock Type# 3	13	9659.56
Rock Type# 7	2	1821.60
Rock Type# 1	203	248216.50
Rock Type# 2	422	522379.12
-----	-----	-----
Bench #13 (456.00 - 446.00)	640	782076.78

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External envelope # 3	BLOCK	TONNAGE

Total (576.00 - 446.00)	5908	6515374.56

GENBLK STATISTICAL REPORT

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ROCK TYPE 5

Title: KAMLOOPS QUARRY BC. 1993

Limits of bench Minimum: 446.00 Maximum: 576.00
Height of benches: 10.00

Limits of lines Y Minimum: 3200.00 Maximum: 3480.00
Width of blocks : 5.00

Limits of columns X ... Minimum: 1600.00 Maximum: 2200.00
Length of blocks: 10.00

First bench number: 1
Density (metric tons): 2.6400

Top topographic limit is use.
Compute topo grid.

Number of external envelope: 1

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KAMLOOPS QUARRY BC. 1993

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Total for each bench:	BLOCK	TONNAGE
Bench # 1 (576.00 - 566.00)	0	0.00
Bench # 2 (566.00 - 556.00)	0	0.00
Bench # 3 (556.00 - 546.00)	0	0.00
Bench # 4 (546.00 - 536.00)	0	0.00
Bench # 5 (536.00 - 526.00)	0	0.00
Bench # 6 (526.00 - 516.00)	9	422.39
Bench # 7 (516.00 - 506.00)	20	1675.01
Bench # 8 (506.00 - 496.00)	41	4149.61
Bench # 9 (496.00 - 486.00)	46	4652.56
Bench #10 (486.00 - 476.00)	46	4656.58
Bench #11 (476.00 - 466.00)	45	4632.58
Bench #12 (466.00 - 456.00)	46	4655.07
Bench #13 (456.00 - 446.00)	45	4617.22
Total (576.00 - 446.00)	298	29461.02

GENBLK STATISTICAL REPORT

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ROCK TYPE 6

Title: KAMLOOPS QUARRY BC. 1993

Limits of bench Minimum: 446.00 Maximum: 576.00
Height of benches: 10.00

Limits of lines Y Minimum: 3200.00 Maximum: 3480.00
Width of blocks : 5.00

Limits of columns X ... Minimum: 1600.00 Maximum: 2200.00
Length of blocks: 10.00

First bench number: 1
Density (metric tons): 2.6400

Top topographic limit is use.
Compute topo grid.

Number of external envelope: 1

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KAMLOOPS QUARRY BC. 1993

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The external envelope # 1 have 4 planes.

No	Plane	Name	X	Y	Z	Asimuth	Dip
1	8	PLAN#8					
		First point :	2008.95	3349.76	498.86	3.70	84.35
		Second point:	2093.82	3344.27	498.86		
		Third point :	2097.00	3349.50	443.99		
2	7	PLAN#7					
		First point :	2093.82	3340.81	498.86	-90.00	90.00
		Second point:	2093.82	3344.27	498.86		
		Third point :	2093.82	3344.27	400.00		
3	6	PLAN#6					
		First point :	2010.51	3346.20	498.86	3.70	84.35
		Second point:	2093.82	3340.81	498.86		
		Third point :	2097.00	3346.04	443.99		
4	10	PLAN#10					
		First point :	2057.74	3238.10	498.86	66.40	61.93
		Second point:	1943.38	3499.85	498.86		
		Third point :	1851.74	3459.81	311.33		

GENBLK STATISTICAL REPORT
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Total for each bench:	BLOCK	TONNAGE
Bench # 1 (576.00 - 566.00)	0	0.00
Bench # 2 (566.00 - 556.00)	0	0.00
Bench # 3 (556.00 - 546.00)	0	0.00
Bench # 4 (546.00 - 536.00)	0	0.00
Bench # 5 (536.00 - 526.00)	0	0.00
Bench # 6 (526.00 - 516.00)	0	0.00
Bench # 7 (516.00 - 506.00)	6	668.43
Bench # 8 (506.00 - 496.00)	8	7316.36
Bench # 9 (496.00 - 486.00)	9	7973.42
Bench #10 (486.00 - 476.00)	7	6700.94
Bench #11 (476.00 - 466.00)	8	8660.01
Bench #12 (466.00 - 456.00)	11	10729.26
Bench #13 (456.00 - 446.00)	10	10378.16
Total (576.00 - 446.00)	59	52426.58

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KAMLOOPS QUARRY BC. 1993

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ROCK TYPE 7

Title: KAMLOOPS QUARRY BC. 1993

Limits of bench Minimum: 446.00 Maximum: 576.00
Height of benches: 10.00

Limits of lines Y Minimum: 3200.00 Maximum: 3480.00
Width of blocks : 5.00

Limits of columns X ... Minimum: 1600.00 Maximum: 2200.00
Length of blocks: 10.00

First bench number: 1
Density (metric tons): 2.6400

Top topographic limit is use.
Compute topo grid.

Number of external envelope: 1

GENBLK STATISTICAL REPORT

KAMLOOPS QUARRY BC. 1993

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The external envelope # 1 have 4 planes.

No	Plane	Name	X	Y	Z	Azinuth	Dip
1	19	PLAN#19					
		First point :	1735.26	3343.63	498.86	0.35	70.00
		Second point:	2010.02	3341.93	498.86		
		Third point :	2010.64	3441.93	224.11		
2	5	PLAN#5					
		First point :	2021.80	3337.80	498.86	-90.00	90.00
		Second point:	2021.80	3341.86	498.86		
		Third point :	2021.80	3341.86	400.00		
3	17	PLAN#17					
		First point :	1743.63	3339.56	498.86	0.36	70.00
		Second point:	2011.80	3337.86	498.86		
		Third point :	2012.43	3437.86	224.11		
4	10	PLAN#10					
		First point :	2057.74	3238.10	498.86	66.40	61.93
		Second point:	1943.38	3499.85	498.86		
		Third point :	1851.74	3459.81	311.33		

GENBLK STATISTICAL REPORT
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The rock type # 8 have 1 top planes.

No	Plane	Name	X	Y	Z	Asimuth	Dip
1	19	PLAN#19					
		First point :	1735.26	3343.63	498.86	0.35	70.00
		Second point:	2010.02	3341.93	498.86		
		Third point :	2010.64	3441.93	224.11		

The rock type # 8 have 1 bottom planes.

No	Plane	Name	X	Y	Z	Asimuth	Dip
1	17	PLAN#17					
		First point :	1743.63	3339.56	498.86	0.36	70.00
		Second point:	2011.80	3337.86	498.86		
		Third point :	2012.43	3437.86	224.11		

Topo estimated at 3360 grid points
 3031 grid points estimated by cell average
 329 grid points estimated by ISD with:
 a maximum of 5 closest controls
 in a search zone of size = 26.46

GENBLK STATISTICAL REPORT

KAMLOOPS QUARRY BC. 1993

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Total for each bench:	BLOCK	TONNAGE
Bench # 1 (576.00 - 566.00)	0	0.00
Bench # 2 (566.00 - 556.00)	0	0.00
Bench # 3 (556.00 - 546.00)	0	0.00
Bench # 4 (546.00 - 536.00)	0	0.00
Bench # 5 (536.00 - 526.00)	0	0.00
Bench # 6 (526.00 - 516.00)	0	0.00
Bench # 7 (516.00 - 506.00)	0	0.00
Bench # 8 (506.00 - 496.00)	2	516.81
Bench # 9 (496.00 - 486.00)	3	1867.85
Bench #10 (486.00 - 476.00)	4	2216.31
Bench #11 (476.00 - 466.00)	0	0.00
Bench #12 (466.00 - 456.00)	5	3439.05
Bench #13 (456.00 - 446.00)	6	5815.73
Total (576.00 - 446.00)	20	13855.75

GENBLK STATISTICAL REPORT

KAMLOOPS QUARRY BC. 1993

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ROCK TYPE 8

Title: KAMLOOPS QUARRY BC. 1993

Limits of bench Minimum: 446.00 Maximum: 576.00
Height of benches: 10.00

Limits of lines Y Minimum: 3200.00 Maximum: 3480.00
Width of blocks : 5.00

Limits of columns X ... Minimum: 1600.00 Maximum: 2200.00
Length of blocks: 10.00

First bench number: 1
Density (metric tons): 2.6400

Top topographic limit is use.
Compute topo grid.

Number of external envelope: 1

GENBLK STATISTICAL REPORT
KAMLOOPS QUARRY BC. 1993

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The rock type # 8 have 1 top planes.

No	Plane Name	X	Y	Z	Asimuth	Dip
1	19 PLAN#19					
	First point :	1735.26	3343.63	498.86	0.35	70.00
	Second point:	2010.02	3341.93	498.86		
	Third point :	2010.64	3441.93	224.11		

The rock type # 8 have 1 bottom planes.

No	Plane Name	X	Y	Z	Asimuth	Dip
1	17 PLAN#17					
	First point :	1743.63	3339.56	498.86	0.36	70.00
	Second point:	2011.80	3337.86	498.86		
	Third point :	2012.43	3437.86	224.11		

Topo estimated at 3360 grid points
 3031 grid points estimated by cell average
 329 grid points estimated by ISD with:
 a maximum of 5 closest controls
 in a search zone of size = 26.46

GENBLK STATISTICAL REPORT

KAMLOOPS QUARRY BC. 1993

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Total for each bench:	BLOCK	TONNAGE
Bench # 1 (576.00 - 566.00)	0	0.00
Bench # 2 (566.00 - 556.00)	0	0.00
Bench # 3 (556.00 - 546.00)	0	0.00
Bench # 4 (546.00 - 536.00)	0	0.00
Bench # 5 (536.00 - 526.00)	0	0.00
Bench # 6 (526.00 - 516.00)	14	2978.61
Bench # 7 (516.00 - 506.00)	24	19678.87
Bench # 8 (506.00 - 496.00)	14	7954.05
Bench # 9 (496.00 - 486.00)	27	25698.96
Bench #10 (486.00 - 476.00)	27	32265.02
Bench #11 (476.00 - 466.00)	23	19816.51
Bench #12 (466.00 - 456.00)	15	9153.67
Bench #13 (456.00 - 446.00)	28	28515.63
Total (576.00 - 446.00)	172	146061.31

GENBLK STATISTICAL REPORT

KAMLOOPS QUARRY BC. 1993

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ROCK TYPE 9

Title: KAMLOOPS QUARRY BC. 1993

Limits of bench Minimum: 446.00 Maximum: 576.00

Height of benches: 10.00

Limits of lines Y Minimum: 3200.00 Maximum: 3480.00

Width of blocks : 5.00

Limits of columns X ... Minimum: 1600.00 Maximum: 2200.00

Length of blocks: 10.00

First bench number: 1

Density (metric tons): 2.6400

Top topographic limit is use.

Compute topo grid.

Number of external envelope: 1

GENBLK STATISTICAL REPORT
KAMLOOPS QUARRY BC. 1993

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The external envelope # 1 have 4 planes.

No	Plane	Name	X	Y	Z	Azimuth	Dip
1	21	PLAN#21					
		First point :	1814.19	3370.74	498.86	6.20	72.50
		Second point:	2006.57	3349.83	498.86		
		Third point :	2017.38	3449.24	181.71		
2	11	PLAN#11					
		First point :	2055.36	3238.15	498.86	66.40	61.93
		Second point:	1941.16	3499.55	498.86		
		Third point :	1849.52	3459.52	311.34		
3	22	PLAN#22					
		First point :	1814.19	3367.32	498.86	6.20	72.50
		Second point:	2008.13	3346.26	498.86		
		Third point :	2018.93	3445.68	181.69		
4	23	PLAN#23					
		First point :	1814.19	3367.32	498.86	-90.00	90.00
		Second point:	1814.19	3370.74	498.86		
		Third point :	1814.19	3370.74	400.00		

GENBLK STATISTICAL REPORT
KAMLOOPS QUARRY BC. 1993

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The rock type # 8 have 1 top planes.

No	Plane Name	X	Y	Z	Asimuth	Dip
1	21 PLAN#21					
	First point :	1814.19	3370.74	498.86	6.20	72.50
	Second point:	2006.57	3349.83	498.86		
	Third point :	2017.38	3449.24	181.71		

The rock type # 8 have 1 bottom planes.

No	Plane Name	X	Y	Z	Asimuth	Dip
1	22 PLAN#22					
	First point :	1814.19	3367.32	498.86	6.20	72.50
	Second point:	2008.13	3346.26	498.86		
	Third point :	2018.93	3445.68	181.69		

Topo estimated at 3360 grid points
 3031 grid points estimated by cell average
 329 grid points estimated by ISD with:
 a maximum of 5 closest controls
 in a search zone of size = 26.46

GENBLK STATISTICAL REPORT
KAMLOOPS QUARRY BC. 1993

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Total for each bench:	BLOCK	TONNAGE
Bench # 1 (576.00 - 566.00)	0	0.00
Bench # 2 (566.00 - 556.00)	0	0.00
Bench # 3 (556.00 - 546.00)	0	0.00
Bench # 4 (546.00 - 536.00)	0	0.00
Bench # 5 (536.00 - 526.00)	0	0.00
Bench # 6 (526.00 - 516.00)	7	1082.41
Bench # 7 (516.00 - 506.00)	18	12641.92
Bench # 8 (506.00 - 496.00)	17	14167.72
Bench # 9 (496.00 - 486.00)	18	13067.03
Bench #10 (486.00 - 476.00)	17	12893.19
Bench #11 (476.00 - 466.00)	17	11793.28
Bench #12 (466.00 - 456.00)	15	10681.89
Bench #13 (456.00 - 446.00)	15	11651.42
Total (576.00 - 446.00)	124	87978.85

APPENDIX 4

PLAN LIMIT FOR EACH BENCH

1	6BENCH 516		0
2	1693.99	3432.97	516.00
2	1722.16	3445.45	516.00
2	1749.51	3450.62	516.00
2	1771.06	3454.03	516.00
2	1793.99	3451.81	516.00
2	1815.85	3449.66	516.00
2	1851.78	3445.81	516.00
2	1874.51	3445.10	516.00
2	1898.25	3438.98	516.00
2	1917.12	3437.57	516.00
2	1947.56	3431.33	516.00
2	1967.17	3424.79	516.00
2	1979.35	3419.68	516.00
2	2002.94	3415.30	516.00
2	2023.83	3411.73	516.00
2	2047.93	3405.56	516.00
2	2095.46	3393.10	516.00
2	2109.79	3383.92	516.00
2	2123.12	3373.03	516.00
2	2127.40	3370.29	516.00
2	2148.10	3361.68	516.00
2	2168.14	3353.35	516.00
2	2180.75	3350.35	516.00
2	2182.45	3349.23	516.00
2	2183.37	3290.00	516.00
2	2130.00	3262.50	516.00
2	2095.27	3255.46	516.00
2	2056.31	3248.85	516.00
2	2031.90	3244.83	516.00
2	1859.46	3292.48	516.00
2	1682.49	3371.52	516.00
2	1669.97	3378.97	516.00
2	1660.00	3383.50	516.00
2	1660.00	3398.09	516.00

1	7BENCH 506		0
2	1660.00	3383.50	506.00
2	1660.00	3398.09	506.00
2	1677.69	3409.35	506.00
2	1698.24	3422.71	506.00
2	1719.09	3434.67	506.00
2	1751.44	3440.73	506.00
2	1771.42	3444.13	506.00
2	1793.97	3441.86	506.00
2	1814.86	3439.70	506.00
2	1851.24	3436.04	506.00
2	1898.37	3429.39	506.00
2	1950.67	3417.07	506.00
2	1999.39	3406.42	506.00
2	2021.54	3403.00	506.00
2	2031.48	3400.00	506.00
2	2064.52	3390.28	506.00
2	2092.07	3380.63	506.00
2	2118.38	3364.44	506.00
2	2151.24	3348.45	506.00
2	2166.34	3341.49	506.00

2	2178.51	3332.50	506.00
2	2183.37	3292.95	506.00
2	2183.37	3290.00	506.00
2	2130.00	3262.50	506.00
2	2095.27	3255.46	506.00
2	2056.31	3248.85	506.00
2	2031.90	3244.83	506.00
2	1859.46	3292.48	506.00
2	1682.49	3371.52	506.00
2	1669.97	3378.97	506.00
1	8BENCH 496		0
2	1669.97	3378.56	496.00
2	1670.02	3392.36	496.00
2	1683.03	3401.11	496.00
2	1703.39	3414.09	496.00
2	1722.51	3425.06	496.00
2	1753.38	3431.22	496.00
2	1772.01	3434.03	496.00
2	1793.12	3431.97	496.00
2	1850.15	3426.04	496.00
2	1896.87	3419.28	496.00
2	1948.69	3407.12	496.00
2	1997.09	3396.57	496.00
2	2019.61	3393.19	496.00
2	2061.67	3380.37	496.00
2	2087.97	3371.69	496.00
2	2113.59	3355.59	496.00
2	2147.01	3339.04	496.00
2	2161.22	3332.42	496.00
2	2170.48	3326.80	496.00
2	2174.22	3294.37	496.00
2	2094.77	3255.34	496.00
2	2031.90	3244.83	496.00
2	1859.46	3292.48	496.00
2	1682.49	3371.52	496.00
1	9BENCH 486		0
2	1689.32	3382.69	486.00
2	1689.27	3392.60	486.00
2	1708.47	3405.61	486.00
2	1725.92	3415.96	486.00
2	1755.19	3421.23	486.00
2	1772.00	3424.09	486.00
2	1792.05	3421.99	486.00
2	1812.82	3420.00	486.00
2	1848.90	3416.11	486.00
2	1895.03	3409.51	486.00
2	1946.30	3397.44	486.00
2	1995.39	3386.63	486.00
2	2017.18	3383.65	486.00
2	2058.41	3370.93	486.00
2	2083.47	3362.79	486.00
2	2108.68	3347.04	486.00
2	2109.79	3346.85	486.00
2	2156.00	3323.60	486.00
2	2160.62	3321.69	486.00
2	2163.18	3300.19	486.00

2	2094.89	3265.41	486.00
2	2072.25	3261.45	486.00
2	2056.23	3248.77	486.00
2	2031.90	3244.83	486.00
2	1859.46	3292.48	486.00
1	10BENCH 476		0
2	1709.08	3383.85	476.00
2	1709.04	3394.10	476.00
2	1713.37	3396.96	476.00
2	1729.22	3406.41	476.00
2	1756.83	3411.47	476.00
2	1772.33	3414.16	476.00
2	1790.90	3412.05	476.00
2	1811.68	3410.12	476.00
2	1847.31	3406.18	476.00
2	1849.16	3406.63	476.00
2	1893.37	3399.70	476.00
2	1944.27	3387.71	476.00
2	1993.71	3376.83	476.00
2	2014.84	3373.81	476.00
2	2055.24	3361.49	476.00
2	2079.31	3353.85	476.00
2	2103.64	3338.04	476.00
2	2150.31	3315.56	476.00
2	2151.48	3305.40	476.00
2	2090.91	3275.28	476.00
2	2067.30	3270.82	476.00
2	2049.92	3257.79	476.00
2	2032.56	3254.75	476.00
2	2017.89	3258.48	476.00
2	2005.78	3266.09	476.00
2	2001.84	3254.53	476.00
2	1890.46	3293.04	476.00
2	1867.60	3298.95	476.00
2	1787.41	3341.83	476.00
1	11BENCH 466		0
2	1730.21	3385.67	466.00
2	1730.33	3395.73	466.00
2	1732.47	3397.07	466.00
2	1758.72	3401.64	466.00
2	1772.57	3404.19	466.00
2	1789.99	3402.16	466.00
2	1810.49	3400.21	466.00
2	1845.96	3396.46	466.00
2	1891.13	3389.86	466.00
2	1941.99	3378.08	466.00
2	1991.79	3367.08	466.00
2	2012.59	3364.24	466.00
2	2052.09	3351.97	466.00
2	2075.01	3344.71	466.00
2	2099.05	3329.20	466.00
2	2127.78	3315.23	466.00
2	2128.40	3305.13	466.00
2	2088.41	3284.57	466.00
2	2063.66	3280.28	466.00
2	2046.43	3267.35	466.00

2	2033.77	3265.15	466.00
2	2021.19	3268.29	466.00
2	2010.98	3274.59	466.00
2	1924.80	3300.54	466.00
2	1896.26	3309.27	466.00
2	1875.50	3314.28	466.00
2	1869.35	3303.63	466.00
2	1768.38	3363.21	466.00
2	1749.66	3374.29	466.00
1	12BENCH 456		0
2	1793.37	3382.49	456.00
2	1798.09	3391.27	456.00
2	1809.87	3390.23	456.00
2	1844.68	3386.29	456.00
2	1890.00	3379.95	456.00
2	1939.76	3368.12	456.00
2	1989.86	3357.14	456.00
2	2010.70	3354.19	456.00
2	2049.08	3342.27	456.00
2	2050.18	3342.00	456.00
2	2070.70	3335.53	456.00
2	2094.16	3320.23	456.00
2	2105.18	3314.86	456.00
2	2106.23	3304.99	456.00
2	2084.85	3294.11	456.00
2	2059.80	3289.92	456.00
2	2042.39	3276.97	456.00
2	2034.07	3275.40	456.00
2	2025.00	3277.73	456.00
2	2014.81	3284.07	456.00
2	1912.22	3314.78	456.00
2	1896.78	3319.49	456.00
2	1887.32	3321.78	456.00
2	1877.95	3323.88	456.00
2	1781.39	3375.07	456.00
2	1786.94	3385.91	456.00
1	13BENCH 446		0
2	1822.16	3369.40	446.00
2	1825.99	3378.36	446.00
2	1843.06	3376.48	446.00
2	1887.49	3370.31	446.00
2	1937.47	3358.48	446.00
2	1988.11	3347.38	446.00
2	2008.13	3344.42	446.00
2	2045.98	3332.67	446.00
2	2066.39	3326.52	446.00
2	2083.99	3315.03	446.00
2	2085.14	3304.47	446.00
2	2054.40	3298.58	446.00
2	2039.77	3287.70	446.00
2	1912.31	3319.82	446.00
2	1915.80	3331.44	446.00
2	1884.48	3336.55	446.00

THERE ARE 196 PLANE(S) IN THE PLANES DATA BANK

PLANE NUM.	XP	YP	ZP
1	1650.00	3459.48	498.86
	1776.19	3476.63	498.86
	1776.19	3476.63	400.00
NAME : PLAN#1			
2	1776.19	3476.63	498.86
	1889.60	3448.66	498.86
	1889.60	3448.66	400.00
NAME : PLAN#2			
3	1889.60	3448.66	498.86
	1914.27	3437.15	498.86
	1914.27	3437.15	400.00
NAME : PLAN#3			
4	1914.27	3437.15	498.86
	2098.37	3396.84	498.86
	2098.37	3396.84	400.00
NAME : PLAN#4			
5	2021.80	3337.80	498.86
	2021.80	3341.86	498.86
	2021.80	3341.86	400.00
NAME : PLAN#5			
6	2010.51	3346.20	498.86
	2093.82	3340.81	498.86
	2097.00	3346.04	443.99
NAME : PLAN#6			
7	2093.82	3340.81	498.86
	2093.82	3344.27	498.86
	2093.82	3344.27	400.00
NAME : PLAN#7			
8	2008.95	3349.76	498.86
	2093.82	3344.27	498.86
	2097.00	3349.50	443.99
NAME : PLAN#8			
10	2057.74	3238.10	498.86
	1943.38	3499.85	498.86
	1851.74	3459.81	311.33
NAME : PLAN#10			
11	2055.36	3238.15	498.86
	1941.16	3499.55	498.86
	1849.52	3459.52	311.34
NAME : PLAN#11			
15	2098.37	3396.84	498.86

	2133.56	3368.84	498.86
	2133.56	3368.84	400.00
NAME : PLAN#15			
16	2133.56	3368.84	498.86
	2200.00	3365.23	498.86
	2200.00	3365.23	400.00
NAME : PLAN#16			
17	1743.63	3339.56	498.86
	2011.80	3337.86	498.86
	2012.43	3437.86	224.11
NAME : PLAN#17			
19	1735.26	3343.63	498.86
	2010.02	3341.93	498.86
	2010.64	3441.93	224.11
NAME : PLAN#19			
20	2201.00	3365.23	498.86
	2199.50	3235.11	498.86
	2199.50	3235.11	400.00
NAME : PLAN#20			
21	1814.19	3370.74	498.86
	2006.57	3349.83	498.86
	2017.38	3449.24	181.71
NAME : PLAN#21			
22	1814.19	3367.32	498.86
	2008.13	3346.26	498.86
	2018.93	3445.68	181.69
NAME : PLAN#22			
23	1814.19	3367.32	498.86
	1814.19	3370.74	498.86
	1814.19	3370.74	400.00
NAME : PLAN#23			
24	2200.00	3235.11	498.86
	2070.00	3234.90	498.86
	2070.00	3234.90	400.00
NAME : PLAN#24			
25	2070.00	3234.90	498.86
	1960.00	3265.13	498.86
	1960.00	3265.13	400.00
NAME : PLAN#25			
26	1960.00	3265.13	498.86
	1860.00	3292.88	498.86
	1860.00	3292.88	400.00
NAME : PLAN#26			
27	1860.00	3292.88	498.86
	1775.00	3330.74	498.86
	1775.00	3330.74	400.00
NAME : PLAN#27			
28	1775.00	3330.74	498.86

1700.00 3361.40 498.86
1700.00 3361.40 400.00

NAME : PLAN#28

29 1700.00 3361.40 498.86
1650.00 3370.00 498.86
1650.00 3370.00 400.00

NAME : PLAN#29

30 1650.00 3370.00 498.86
1650.00 3459.48 498.96
1650.00 3459.48 400.00

NAME : PLAN#30

31 2028.93 3304.04 498.86
2200.00 3264.72 498.86
2030.09 3298.45 400.00

NAME : PLAN#31

1001 2031.90 3244.83 516.00
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1859.46 3292.48 506.00

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1002 1859.46 3292.48 516.00
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1682.49 3371.52 506.00

NAME : BENCH_516

1003 1682.49 3371.52 516.00
1680.33 3388.77 516.00
1680.33 3388.77 506.00

NAME : BENCH_516

1004 1680.33 3388.77 516.00
1685.03 3396.19 516.00
1685.03 3396.19 506.00

NAME : BENCH_516

1005 1685.03 3396.19 516.00
1723.91 3429.43 516.00
1723.91 3429.43 506.00

NAME : BENCH_516

1006 1723.91 3429.43 516.00
1768.65 3443.00 516.00
1768.65 3443.00 506.00

NAME : BENCH_516

1007 1768.65 3443.00 516.00
1786.37 3443.91 516.00
1786.37 3443.91 506.00

NAME : BENCH_516

1008 1786.37 3443.91 516.00
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1965.61 3414.35 506.00

NAME : BENCH_516

1009 1965.61 3414.35 516.00

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2096.41 3384.62 506.00

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1010 2096.41 3384.62 516.00
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2118.64 3368.60 506.00

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1011 2118.64 3368.60 516.00
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2131.76 3361.04 506.00

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1012 2131.76 3361.04 516.00
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2145.30 3356.10 506.00

NAME : BENCH_516

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2160.32 3355.21 506.00

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2168.25 3352.09 506.00

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2186.84 3335.23 506.00

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2185.88 3281.97 506.00

NAME : BENCH_516

1018 2185.88 3281.97 516.00
2179.48 3269.48 516.00
2179.48 3269.48 506.00

NAME : BENCH_516

1019 2179.48 3269.48 516.00
2140.79 3257.61 516.00
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NAME : BENCH_516

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1021 2095.22 3255.42 516.00

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1022 2055.89 3248.69 516.00
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1024 1859.43 3292.44 506.00
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1033 2029.31 3391.55 506.00

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1034	2093.32	3377.18	506.00
	2111.78	3363.46	506.00
	2111.78	3363.46	496.00

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1035	2111.78	3363.46	506.00
	2127.79	3354.20	506.00
	2127.79	3354.20	496.00

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1036	2127.79	3354.20	506.00
	2134.95	3349.30	506.00
	2134.95	3349.30	496.00

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1037	2134.95	3349.30	506.00
	2143.74	3346.12	506.00
	2143.74	3346.12	496.00

NAME : BENCH_506

1038	2143.74	3346.12	506.00
	2157.63	3345.64	506.00
	2157.63	3345.64	496.00

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1039	2157.63	3345.64	506.00
	2162.36	3343.56	506.00
	2162.36	3343.56	496.00

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1040	2162.36	3343.56	506.00
	2172.74	3336.77	506.00
	2172.74	3336.77	496.00

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1041	2172.74	3336.77	506.00
	2186.29	3320.67	506.00
	2186.29	3320.67	496.00

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1042	2186.29	3320.67	506.00
	2186.08	3281.91	506.00
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1043	2186.08	3281.91	506.00
	2179.40	3269.41	506.00
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1044	2179.40	3269.41	506.00
	2140.65	3257.61	506.00
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1045	2140.65	3257.61	506.00
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1046	2095.27	3255.46	506.00
	2056.31	3248.85	506.00
	2056.31	3248.85	496.00

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1048	2031.79	3244.68	496.00
	1859.35	3292.47	496.00
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1049	1859.35	3292.47	496.00
	1692.52	3369.08	496.00
	1692.52	3369.08	486.00

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1050	1692.52	3369.08	496.00
	1691.06	3386.18	496.00
	1691.06	3386.18	486.00

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	1734.35	3411.58	496.00
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1052	1734.35	3411.58	496.00
	1770.45	3423.14	496.00
	1770.45	3423.14	486.00

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	1786.10	3423.85	486.00

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1055	1965.72	3393.87	496.00
	2019.30	3381.67	496.00
	2019.30	3381.67	486.00

NAME : BENCH_496

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	2028.27	3381.47	496.00
	2028.27	3381.47	486.00

NAME : BENCH_496

1057	2028.27	3381.47	496.00
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	2090.07	3367.42	496.00
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1058	2090.07	3367.42	496.00
	2105.58	3356.22	496.00
	2105.58	3356.22	486.00
NAME : BENCH_496			
1059	2105.58	3356.22	496.00
	2121.63	3346.49	496.00
	2121.63	3346.49	486.00
NAME : BENCH_496			
1060	2121.63	3346.49	496.00
	2130.68	3339.99	496.00
	2130.68	3339.99	486.00
NAME : BENCH_496			
1061	2130.68	3339.99	496.00
	2140.72	3336.23	496.00
	2140.72	3336.23	486.00
NAME : BENCH_496			
1062	2140.72	3336.23	496.00
	2154.97	3335.44	496.00
	2154.97	3335.44	486.00
NAME : BENCH_496			
1063	2154.97	3335.44	496.00
	2166.09	3329.10	496.00
	2166.09	3329.10	486.00
NAME : BENCH_496			
1064	2166.09	3329.10	496.00
	2176.70	3316.07	496.00
	2176.70	3316.07	486.00
NAME : BENCH_496			
1065	2176.70	3316.07	496.00
	2175.84	3284.25	496.00
	2175.84	3284.25	486.00
NAME : BENCH_496			
1066	2175.84	3284.25	496.00
	2172.29	3277.37	496.00
	2172.29	3277.37	486.00
NAME : BENCH_496			
1067	2172.29	3277.37	496.00
	2151.78	3269.75	496.00
	2151.78	3269.75	486.00
NAME : BENCH_496			
1068	2151.78	3269.75	496.00
	2140.87	3257.62	496.00
	2140.87	3257.62	486.00
NAME : BENCH_496			
1069	2140.87	3257.62	496.00

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2095.32 3255.51 486.00

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NAME : BENCH_486

1080 2017.86 3371.83 486.00
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2027.74 3371.54 476.00

NAME : BENCH_486

1081 2027.74 3371.54 486.00

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1082	2086.64	3358.29	486.00
	2100.55	3348.02	486.00
	2100.55	3348.02	476.00
NAME : BENCH_486			
1083	2100.55	3348.02	486.00
	2126.53	3331.02	486.00
	2126.53	3331.02	476.00
NAME : BENCH_486			
1084	2126.53	3331.02	486.00
	2139.06	3325.99	486.00
	2139.06	3325.99	476.00
NAME : BENCH_486			
1085	2139.06	3325.99	486.00
	2151.30	3325.52	486.00
	2151.30	3325.52	476.00
NAME : BENCH_486			
1086	2151.30	3325.52	486.00
	2158.39	3321.80	486.00
	2158.39	3321.80	476.00
NAME : BENCH_486			
1087	2158.39	3321.80	486.00
	2166.10	3312.54	486.00
	2166.10	3312.54	476.00
NAME : BENCH_486			
1088	2166.10	3312.54	486.00
	2165.35	3285.06	486.00
	2165.35	3285.06	476.00
NAME : BENCH_486			
1089	2165.35	3285.06	486.00
	2145.61	3278.45	486.00
	2145.61	3278.45	476.00
NAME : BENCH_486			
1090	2145.61	3278.45	486.00
	2135.88	3267.19	486.00
	2135.88	3267.19	476.00
NAME : BENCH_486			
1091	2135.88	3267.19	486.00
	2094.63	3265.37	486.00
	2094.63	3265.37	476.00
NAME : BENCH_486			
1092	2094.63	3265.37	486.00
	2072.34	3261.50	486.00
	2072.34	3261.50	476.00
NAME : BENCH_486			
1093	2072.34	3261.50	486.00

2056.50	3248.69	486.00
2056.50	3248.69	476.00

NAME : BENCH_486

1094	2056.50	3248.69	486.00
	2031.75	3244.69	486.00
	2031.75	3244.69	476.00

NAME : BENCH_486

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	1890.49	3293.18	476.00
	1890.49	3293.18	466.00

NAME : BENCH_476

1096	1890.49	3293.18	476.00
	1867.34	3299.16	476.00
	1867.34	3299.16	466.00

NAME : BENCH_476

1097	1867.34	3299.16	476.00
	1726.79	3374.14	476.00
	1726.79	3374.14	466.00

NAME : BENCH_476

1098	1726.79	3374.14	476.00
	1726.05	3383.97	476.00
	1726.05	3383.97	466.00

NAME : BENCH_476

1099	1726.05	3383.97	476.00
	1742.32	3393.07	476.00
	1742.32	3393.07	466.00

NAME : BENCH_476

1100	1742.32	3393.07	476.00
	1774.26	3403.12	476.00
	1774.26	3403.12	466.00

NAME : BENCH_476

1101	1774.26	3403.12	476.00
	1783.85	3403.64	476.00
	1783.85	3403.64	466.00

NAME : BENCH_476

1102	1783.85	3403.64	476.00
	1961.06	3374.39	476.00
	1961.06	3374.39	466.00

NAME : BENCH_476

1103	1961.06	3374.39	476.00
	2018.69	3361.15	476.00
	2018.69	3361.15	466.00

NAME : BENCH_476

1104	2018.69	3361.15	476.00
	2025.09	3361.50	476.00
	2025.09	3361.50	466.00

NAME : BENCH_476

1105	2025.09	3361.50	476.00
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	2082.31	3348.98	476.00
	2082.31	3348.98	466.00
NAME : BENCH_476			
1106	2082.31	3348.98	476.00
	2121.29	3322.25	476.00
	2121.29	3322.25	466.00
NAME : BENCH_476			
1107	2121.29	3322.25	476.00
	2136.25	3316.06	476.00
	2136.25	3316.06	466.00
NAME : BENCH_476			
1108	2136.25	3316.06	476.00
	2147.73	3315.81	476.00
	2147.73	3315.81	466.00
NAME : BENCH_476			
1109	2147.73	3315.81	476.00
	2152.75	3312.79	476.00
	2152.75	3312.79	466.00
NAME : BENCH_476			
1110	2152.75	3312.79	476.00
	2155.96	3308.62	476.00
	2155.96	3308.62	466.00
NAME : BENCH_476			
1111	2155.96	3308.62	476.00
	2155.41	3291.84	476.00
	2155.41	3291.84	466.00
NAME : BENCH_476			
1112	2155.41	3291.84	476.00
	2139.19	3286.64	476.00
	2139.19	3286.64	466.00
NAME : BENCH_476			
1113	2139.19	3286.64	476.00
	2131.05	3277.05	476.00
	2131.05	3277.05	466.00
NAME : BENCH_476			
1114	2131.05	3277.05	476.00
	2090.89	3275.26	476.00
	2090.89	3275.26	466.00
NAME : BENCH_476			
1115	2090.89	3275.26	476.00
	2067.33	3270.97	476.00
	2067.33	3270.97	466.00
NAME : BENCH_476			
1116	2067.33	3270.97	476.00
	2050.11	3257.77	476.00
	2050.11	3257.77	466.00
NAME : BENCH_476			
1117	2050.11	3257.77	476.00

2032.70 3254.88 476.00

2032.70 3254.88 466.00

NAME : BENCH_476

1118

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2017.95 3258.61 476.00

2017.95 3258.61 466.00

NAME : BENCH_476

1119

2017.95 3258.61 476.00

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NAME : BENCH_476

1120

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2002.00 3254.69 476.00

2002.00 3254.69 466.00

NAME : BENCH_476

1121

1869.34 3303.77 466.00

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1749.21 3374.34 456.00

NAME : BENCH_466

1122

1749.21 3374.34 466.00

1748.52 3383.86 466.00

1748.52 3383.86 456.00

NAME : BENCH_466

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1748.52 3383.86 466.00

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1778.54 3394.44 456.00

NAME : BENCH_466

1124

1778.54 3394.44 466.00

1961.08 3364.12 466.00

1961.08 3364.12 456.00

NAME : BENCH_466

1125

1961.08 3364.12 466.00

2018.72 3350.90 466.00

2018.72 3350.90 456.00

NAME : BENCH_466

1126

2018.72 3350.90 466.00

2025.57 3351.48 466.00

2025.57 3351.48 456.00

NAME : BENCH_466

1127

2025.57 3351.48 466.00

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2080.74 3338.27 456.00

NAME : BENCH_466

1128

2080.74 3338.27 466.00

2113.00 3314.88 466.00

2113.00 3314.88 456.00

NAME : BENCH_466

1129

2113.00 3314.88 466.00

	2134.83	3306.20	466.00
	2134.83	3306.20	456.00
NAME : BENCH_466			
1130	2134.83	3306.20	466.00
	2134.60	3296.20	466.00
	2134.60	3296.20	456.00
NAME : BENCH_466			
1131	2134.60	3296.20	466.00
	2126.29	3286.88	466.00
	2126.29	3286.88	456.00
NAME : BENCH_466			
1132	2126.29	3286.88	466.00
	2092.06	3285.38	466.00
	2092.06	3285.38	456.00
NAME : BENCH_466			
1133	2092.06	3285.38	466.00
	2063.76	3280.33	466.00
	2063.76	3280.33	456.00
NAME : BENCH_466			
1134	2063.76	3280.33	466.00
	2046.56	3267.45	466.00
	2046.56	3267.45	456.00
NAME : BENCH_466			
1135	2046.56	3267.45	466.00
	2033.88	3265.30	466.00
	2033.88	3265.30	456.00
NAME : BENCH_466			
1136	2033.88	3265.30	466.00
	2021.18	3268.51	466.00
	2021.18	3268.51	456.00
NAME : BENCH_466			
1137	2021.18	3268.51	466.00
	2011.00	3274.67	466.00
	2011.00	3274.67	456.00
NAME : BENCH_466			
1138	2011.00	3274.67	466.00
	1896.04	3309.32	466.00
	1896.04	3309.32	456.00
NAME : BENCH_466			
1139	1896.04	3309.32	466.00
	1875.38	3314.43	466.00
	1875.38	3314.43	456.00
NAME : BENCH_466			
1140	1875.38	3314.43	466.00
	1869.34	3303.77	466.00
	1869.34	3303.77	456.00
NAME : BENCH_466			
1141	1786.66	3385.92	456.00

	1822.03	3367.25	456.00
	1822.03	3367.25	446.00
NAME : BENCH_456			
1142	1822.03	3367.25	456.00
	1826.65	3376.28	456.00
	1826.65	3376.28	446.00
NAME : BENCH_456			
1143	1826.65	3376.28	456.00
	1961.56	3353.74	456.00
	1961.56	3353.74	446.00
NAME : BENCH_456			
1144	1961.56	3353.74	456.00
	2020.13	3340.28	456.00
	2020.13	3340.28	446.00
NAME : BENCH_456			
1145	2020.13	3340.28	456.00
	2023.67	3341.06	456.00
	2023.67	3341.06	446.00
NAME : BENCH_456			
1146	2023.67	3341.06	456.00
	2076.68	3328.42	456.00
	2076.68	3328.42	446.00
NAME : BENCH_456			
1147	2076.68	3328.42	456.00
	2108.72	3305.31	456.00
	2108.72	3305.31	446.00
NAME : BENCH_456			
1148	2108.72	3305.31	456.00
	2108.35	3296.17	456.00
	2108.35	3296.17	446.00
NAME : BENCH_456			
1149	2108.35	3296.17	456.00
	2089.27	3295.01	456.00
	2089.27	3295.01	446.00
NAME : BENCH_456			
1150	2089.27	3295.01	456.00
	2059.87	3289.99	456.00
	2059.87	3289.99	446.00
NAME : BENCH_456			
1151	2059.87	3289.99	456.00
	2042.54	3276.99	456.00
	2042.54	3276.99	446.00
NAME : BENCH_456			
1152	2042.54	3276.99	456.00
	2034.21	3275.46	456.00
	2034.21	3275.46	446.00
NAME : BENCH_456			
1153	2034.21	3275.46	456.00

2025.09 3277.83 456.00
2025.09 3277.83 446.00

NAME : BENCH_456

1154 2025.09 3277.83 456.00
2014.93 3284.17 456.00
2014.93 3284.17 446.00

NAME : BENCH_456

1155 2014.93 3284.17 456.00
1897.10 3319.47 456.00
1897.10 3319.47 446.00

NAME : BENCH_456

1156 1897.10 3319.47 456.00
1877.97 3324.01 456.00
1877.97 3324.01 446.00

NAME : BENCH_456

1157 1877.97 3324.01 456.00
1781.14 3375.11 456.00
1781.14 3375.11 446.00

NAME : BENCH_456

1158 1781.14 3375.11 456.00
1786.66 3385.92 456.00
1786.66 3385.92 446.00

NAME : BENCH_456

1159 1915.71 3331.46 446.00
1871.26 3348.84 446.00
1871.26 3348.84 436.00

NAME : BENCH_446

1160 1871.26 3348.84 446.00
1875.83 3357.90 446.00
1875.83 3357.90 436.00

NAME : BENCH_446

1161 1875.83 3357.90 446.00
1962.46 3342.90 446.00
1962.46 3342.90 436.00

NAME : BENCH_446

1162 1962.46 3342.90 446.00
2020.99 3330.41 446.00
2020.99 3330.41 436.00

NAME : BENCH_446

1163 2020.99 3330.41 446.00
2022.33 3330.81 446.00
2022.33 3330.81 436.00

NAME : BENCH_446

1164 2022.33 3330.81 446.00
2071.02 3319.68 446.00
2071.02 3319.68 436.00

NAME : BENCH_446

1165 2071.02 3319.68 446.00

2079.13	3314.19	446.00
2079.13	3314.19	436.00

NAME : BENCH.446

1166	2079.13	3314.19	446.00
	2078.77	3303.38	446.00
	2078.77	3303.38	436.00

NAME : BENCH.446

1167	2078.77	3303.38	446.00
	2054.57	3298.78	446.00
	2054.57	3298.78	436.00

NAME : BENCH.446

1168	2054.57	3298.78	446.00
	2039.89	3287.73	446.00
	2039.89	3287.73	436.00

NAME : BENCH.446

1169	2039.89	3287.73	446.00
	1912.29	3319.93	446.00
	1912.29	3319.93	436.00

NAME : BENCH.446

1170	1912.29	3319.93	446.00
	1915.71	3331.46	446.00
	1915.71	3331.46	436.00

NAME : BENCH.446

APPENDIX 5

**BLAST CHEMISTRY REPORT
BENCHES 7 TO 13**

BLAST RESERVES REPORT
KAMLOOPS LIMESTONE QUARRY 1993

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RESERVE INFORMATION

RESERVE FOR THE GROUP # 1
FROM BLAST 7000 TO BLAST 13998
NUMBER OF BLASTS = 189

TONNAGE TOTAL = 5146407.

AVERAGE VALUE

SIO2 AL2O FE2O CAO MGO LOI SO3 K2O
7.122 0.789 1.030 49.933 0.969 39.982 0.059 0.127

NA2O TIO2 P2O5 CL- NAEQ
0.056 0.058 0.046 0.000 0.138

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Kamloops quarry BC

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NUM	TON	SiO2	AL2O	FE2O	CAO	H2O	LOI	SO3	K2O
7007	3422.	0.890	0.150	0.230	54.870	0.570	43.170	0.030	0.030
7008	5803.	0.740	0.150	0.230	54.940	0.600	43.220	0.030	0.040
7009	9654.	0.490	0.150	0.180	55.070	0.630	43.400	0.030	0.040
7010	14841.	0.410	0.160	0.160	55.130	0.630	43.470	0.030	0.040
7011	21037.	1.510	0.160	0.270	54.400	0.640	42.960	0.030	0.040
7012	26719.	3.550	0.180	0.490	53.060	0.660	41.970	0.030	0.040
7013	31434.	5.620	0.230	0.730	51.650	0.690	40.920	0.040	0.050
7014	32899.	6.450	0.440	0.930	50.880	0.770	40.380	0.040	0.080
7015	34582.	7.100	0.760	1.170	50.080	0.880	39.840	0.050	0.130
7016	34124.	6.930	0.900	1.240	50.030	0.920	39.820	0.050	0.150
7017	39586.	8.150	1.260	1.610	48.780	1.050	38.940	0.060	0.220
7018	41312.	6.860	0.930	1.330	49.950	1.020	39.770	0.060	0.170
7019	44661.	6.930	0.750	1.150	50.090	1.020	39.920	0.060	0.130
7020	45516.	8.200	1.070	1.390	48.910	1.090	39.140	0.060	0.180
7021	48228.	7.220	0.820	1.110	49.970	0.930	39.830	0.050	0.140
7022	52352.	7.730	0.710	1.090	49.790	0.910	39.660	0.050	0.120
7023	53852.	8.220	0.950	1.260	49.190	0.970	39.300	0.050	0.160
7024	52729.	7.070	0.800	1.040	50.090	0.970	39.980	0.050	0.130
7025	52578.	5.770	0.700	0.870	50.960	1.010	40.710	0.050	0.110
7026	51057.	5.870	0.950	1.020	50.530	1.090	40.520	0.060	0.150
7027	46104.	4.740	0.940	0.920	51.290	1.030	41.070	0.060	0.150
7028	35311.	4.000	1.010	0.890	51.610	1.100	41.420	0.060	0.150
7029	14156.	4.010	0.450	0.570	52.420	0.940	41.650	0.050	0.070
7030	5757.	9.210	0.360	0.920	49.100	0.990	39.200	0.050	0.060
7031	5843.	7.670	0.540	0.900	49.740	1.080	39.880	0.060	0.070
7032	6563.	7.230	0.680	0.940	49.880	1.050	39.980	0.060	0.110
7033	7486.	8.700	0.990	1.240	48.520	1.130	39.080	0.080	0.150
7034	7793.	8.540	1.030	1.270	48.580	1.130	39.040	0.080	0.150
7035	6775.	7.240	0.920	1.170	49.590	1.110	39.540	0.080	0.120
7036	6213.	9.830	1.380	1.710	47.260	1.340	37.900	0.110	0.160
7037	14679.	16.810	1.360	1.980	43.130	1.340	34.950	0.100	0.160
7038	24390.	20.900	1.220	1.810	41.110	1.190	33.410	0.140	0.170
7039	22013.	18.980	1.380	1.580	42.080	1.210	34.240	0.260	0.230
7040	8885.	17.720	1.800	1.450	42.380	1.300	34.560	0.430	0.340

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NUM	NA2O	TIO2	P2O5	CL-	NAEQ
7007	0.010	0.020	0.040	-1.000	0.040
7008	0.010	0.020	0.040	-1.000	0.040
7009	0.010	0.020	0.040	-1.000	0.040
7010	0.010	0.020	0.040	-1.000	0.040
7011	0.010	0.020	0.040	-1.000	0.040
7012	0.010	0.030	0.040	-1.000	0.040
7013	0.010	0.040	0.040	-1.000	0.050
7014	0.030	0.060	0.040	-1.000	0.090
7015	0.050	0.090	0.040	-1.000	0.140
7016	0.060	0.120	0.040	-1.000	0.170
7017	0.090	0.170	0.050	-1.000	0.250
7018	0.070	0.170	0.050	-1.000	0.190
7019	0.050	0.140	0.050	-1.000	0.150
7020	0.070	0.120	0.050	-1.000	0.210
7021	0.060	0.080	0.050	-1.000	0.160
7022	0.040	0.070	0.040	-1.000	0.130
7023	0.060	0.060	0.050	-1.000	0.170
7024	0.050	0.050	0.050	-1.000	0.140
7025	0.040	0.040	0.040	-1.000	0.120
7026	0.050	0.050	0.040	-1.000	0.160
7027	0.050	0.050	0.040	-1.000	0.160
7028	0.050	0.050	0.040	-1.000	0.150
7029	0.030	0.030	0.040	-1.000	0.080
7030	0.030	0.030	0.050	-1.000	0.070
7031	0.040	0.030	0.050	-1.000	0.080
7032	0.070	0.040	0.050	-1.000	0.130
7033	0.110	0.050	0.050	-1.000	0.180
7034	0.130	0.060	0.050	-1.000	0.190
7035	0.140	0.060	0.050	-1.000	0.150
7036	0.180	0.090	0.050	-1.000	0.190
7037	0.190	0.090	0.060	-1.000	0.190
7038	0.140	0.070	0.060	-1.000	0.180
7039	0.090	0.060	0.060	-1.000	0.210
7040	0.040	0.070	0.070	-1.000	0.280

BLAST RESERVES REPORT

KAMLOOPS LIMESTONE QUARRY 1993

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RESERVE INFORMATION

RESERVE FOR THE GROUP # 2
FROM BLAST 8000 TO BLAST 8998
NUMBER OF BLASTS = 33

TONNAGE TOTAL = 1195003.

AVERAGE VALUE

SIO2	AL2O	FE2O	CAO	MGO	LOI	SO3	K2O
8.621	0.728	1.120	49.090	0.962	39.246	0.061	0.112

NA2O	TIO2	P2O5	CL-	NAEQ
0.059	0.063	0.047	0.000	0.125

BLAST CHEMISTRY REPORT

Kamloops quarry BC

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NUM	NA2O	TIO2	P2O5	CL-	NA2O
8008	0.010	0.030	0.040	-1.000	0.050
8009	0.010	0.030	0.040	-1.000	0.050
8010	0.010	0.030	0.040	-1.000	0.050
8011	0.010	0.030	0.040	-1.000	0.050
8012	0.030	0.040	0.040	-1.000	0.090
8013	0.030	0.050	0.040	-1.000	0.090
8014	0.020	0.050	0.040	-1.000	0.080
8015	0.010	0.050	0.040	-1.000	0.050
8016	0.050	0.090	0.040	-1.000	0.140
8017	0.040	0.100	0.040	-1.000	0.120
8018	0.020	0.110	0.040	-1.000	0.070
8019	0.050	0.120	0.050	-1.000	0.140
8020	0.040	0.090	0.050	-1.000	0.120
8021	0.020	0.060	0.040	-1.000	0.060
8022	0.040	0.070	0.050	-1.000	0.130
8023	0.040	0.060	0.050	-1.000	0.110
8024	0.010	0.030	0.040	-1.000	0.050
8025	0.050	0.050	0.050	-1.000	0.160
8026	0.050	0.050	0.050	-1.000	0.160
8027	0.030	0.040	0.040	-1.000	0.100
8028	0.050	0.070	0.050	-1.000	0.160
8029	0.050	0.060	0.050	-1.000	0.160
8030	0.070	0.060	0.050	-1.000	0.170
8031	0.050	0.040	0.050	-1.000	0.100
8032	0.050	0.030	0.050	-1.000	0.080
8033	0.100	0.050	0.050	-1.000	0.190
8034	0.130	0.060	0.050	-1.000	0.210
8035	0.130	0.060	0.050	-1.000	0.140
8036	0.190	0.100	0.060	-1.000	0.190
8037	0.200	0.110	0.060	-1.000	0.200
8038	0.170	0.080	0.060	-1.000	0.180
8039	0.120	0.060	0.070	-1.000	0.190
8040	0.060	0.060	0.070	-1.000	0.260

BLAST RESERVES REPORT

KAMLOOPS LIMESTONE QUARRY 1993

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RESERVE INFORMATION

RESERVE FOR THE GROUP # 1
FROM BLAST 9000 TO BLAST 9998
NUMBER OF BLASTS - 31

TONNAGE TOTAL = 1088476.

AVERAGE VALUE

SI02	AL2O	FE2O	CAO	MGO	LOI	SO3	K2O
8.810	0.844	1.193	48.797	0.995	39.118	0.059	0.136

NA2O	TIO2	P2O5	CL-	MAEQ
0.061	0.060	0.049	0.000	0.150

BLAST CHEMISTRY REPORT
Kamloops quarry BC

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NUM	TON	SiO2	AL2O	FE2O	CAO	MGO	LOI	SO3	K2O
9009	6871.	0.180	0.140	0.190	55.440	0.520	43.420	0.030	0.030
9010	13254.	0.830	0.140	0.240	54.920	0.560	43.180	0.030	0.030
9011	19328.	1.670	0.140	0.330	54.330	0.590	42.810	0.030	0.030
9012	24460.	2.250	0.130	0.420	53.880	0.630	42.560	0.030	0.030
9013	28660.	3.520	0.610	0.840	52.380	0.810	41.680	0.040	0.090
9014	32137.	6.680	0.600	1.120	50.390	0.810	40.150	0.040	0.090
9015	34334.	7.330	0.600	1.100	50.030	0.840	39.850	0.040	0.100
9016	36149.	7.740	0.820	1.160	49.570	0.910	39.550	0.050	0.140
9017	38293.	8.190	0.730	1.100	49.470	0.900	39.380	0.050	0.130
9018	40338.	10.110	1.170	1.470	47.780	1.000	38.200	0.060	0.210
9019	41814.	10.710	1.010	1.360	47.650	0.980	38.050	0.060	0.180
9020	42696.	9.120	0.720	1.090	48.960	0.930	39.000	0.050	0.130
9021	43235.	10.000	1.130	1.450	47.830	1.030	38.300	0.060	0.190
9022	43917.	9.590	1.010	1.380	48.200	1.010	38.590	0.060	0.170
9023	44280.	9.890	0.720	1.260	48.380	0.950	38.630	0.050	0.120
9024	44649.	11.000	1.090	1.580	47.160	1.020	37.870	0.060	0.180
9025	44817.	10.200	1.040	1.470	47.700	1.010	38.340	0.060	0.170
9026	45490.	8.230	0.720	1.110	49.320	0.960	39.500	0.050	0.120
9027	45348.	9.090	1.080	1.370	48.320	1.050	38.880	0.070	0.170
9028	44759.	9.240	1.180	1.410	47.970	1.170	38.800	0.070	0.170
9029	44727.	9.230	1.280	1.440	47.890	1.160	38.720	0.070	0.200
9030	46734.	8.470	1.050	1.220	48.650	1.120	39.230	0.070	0.160
9031	46358.	9.510	1.030	1.270	47.960	1.120	38.820	0.070	0.160
9032	45486.	8.030	0.530	0.870	49.480	1.020	39.860	0.060	0.090
9033	39633.	6.710	0.380	0.690	50.540	0.960	40.520	0.060	0.060
9034	36893.	8.700	1.050	1.210	48.440	1.080	39.140	0.080	0.180
9035	32152.	9.110	0.550	0.980	48.770	1.070	39.180	0.060	0.080
9036	28004.	10.970	0.680	1.200	47.370	1.170	38.250	0.070	0.090
9037	24429.	11.880	0.840	1.400	46.560	1.260	37.700	0.080	0.100
9038	18472.	15.050	1.000	1.620	44.560	1.260	36.170	0.080	0.120
9039	10759.	25.630	1.130	1.870	38.650	1.090	31.350	0.130	0.160

BLAST RESERVES REPORT

KAMLOOPS LIMESTONE QUARRY 1993

28-OCT-93

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PAGE 2.0

RESERVE INFORMATION

RESERVE FOR THE GROUP # 2
FROM BLAST 10000 TO BLAST 10998
NUMBER OF BLASTS = 29

TONNAGE TOTAL = 863703.

AVERAGE VALUE

SiO2	Al2O	Fe2O	CaO	MgO	LOI	SO3	K2O
7.420	0.955	1.149	49.466	1.021	39.757	0.061	0.153

Na2O	TiO2	P2O5	CL-	Na2O
0.060	0.059	0.047	0.000	0.164

BLAST CHEMISTRY REPORT
Kamloops quarry BC

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NUM	NA2O	TiO2	P2O5	CL-	NAEQ
10010	0.010	0.020	0.040	-1.000	0.040
10011	0.010	0.020	0.040	-1.000	0.040
10012	0.010	0.020	0.040	-1.000	0.030
10013	0.040	0.060	0.040	-1.000	0.120
10014	0.050	0.070	0.040	-1.000	0.160
10015	0.060	0.070	0.040	-1.000	0.170
10016	0.100	0.100	0.050	-1.000	0.280
10017	0.120	0.100	0.050	-1.000	0.320
10018	0.070	0.070	0.050	-1.000	0.200
10019	0.090	0.080	0.050	-1.000	0.250
10020	0.100	0.090	0.050	-1.000	0.280
10021	0.060	0.070	0.050	-1.000	0.180
10022	0.070	0.070	0.050	-1.000	0.190
10023	0.070	0.080	0.050	-1.000	0.210
10024	0.040	0.050	0.050	-1.000	0.140
10025	0.040	0.050	0.050	-1.000	0.140
10026	0.050	0.060	0.050	-1.000	0.170
10027	0.030	0.050	0.050	-1.000	0.120
10028	0.030	0.050	0.040	-1.000	0.110
10029	0.060	0.060	0.040	-1.000	0.160
10030	0.060	0.050	0.050	-1.000	0.170
10031	0.070	0.050	0.050	-1.000	0.170
10032	0.080	0.050	0.050	-1.000	0.190
10033	0.040	0.020	0.040	-1.000	0.070
10034	0.040	0.020	0.040	-1.000	0.070
10035	0.050	0.030	0.050	-1.000	0.070
10036	0.060	0.040	0.050	-1.000	0.080
10037	0.080	0.040	0.050	-1.000	0.100
10038	0.100	0.050	0.050	-1.000	0.110

BLAST CHEMISTRY REPORT

Kamloops quarry BC

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NUM	TON	SiO2	AL2O	FE2O	CAO	MGO	LOI	SO3	K2O
11011	6401.	0.140	0.110	0.090	55.360	0.590	43.670	0.030	0.030
11012	11984.	0.160	0.110	0.080	55.340	0.600	43.700	0.030	0.030
11013	15816.	1.890	0.650	0.600	53.460	0.810	42.530	0.040	0.090
11014	18014.	3.590	1.110	1.050	51.720	0.970	41.430	0.050	0.150
11015	20364.	5.440	1.760	1.500	49.720	1.070	40.190	0.070	0.290
11016	22543.	4.670	1.470	1.220	50.600	1.010	40.780	0.060	0.250
11017	25118.	3.830	1.110	0.900	51.630	0.930	41.420	0.060	0.200
11018	27594.	5.470	1.690	1.300	49.900	0.990	40.280	0.070	0.310
11019	24141.	3.710	1.370	1.040	51.340	0.980	41.380	0.060	0.250
11020	24755.	2.660	0.900	0.720	52.590	0.940	42.160	0.050	0.150
11021	25333.	4.440	1.460	1.180	50.740	1.060	40.960	0.070	0.240
11022	25981.	4.730	1.140	1.030	50.970	1.030	41.010	0.060	0.180
11023	27184.	5.300	0.670	0.840	51.200	0.980	40.990	0.050	0.100
11024	28643.	5.250	0.810	0.910	51.060	1.000	40.950	0.060	0.120
11025	29330.	3.460	0.480	0.570	52.610	0.930	42.040	0.050	0.070
11026	29866.	2.710	0.300	0.410	53.310	0.900	42.510	0.040	0.040
11027	29150.	4.790	1.060	0.990	50.940	1.100	41.070	0.070	0.150
11028	29533.	3.430	0.650	0.650	52.350	1.010	41.950	0.050	0.080
11029	32514.	2.580	0.400	0.430	53.240	0.900	42.440	0.050	0.060
11030	32052.	4.400	0.610	0.680	51.830	0.890	41.460	0.060	0.100
11031	27584.	5.680	0.310	0.590	51.290	0.850	41.160	0.060	0.050
11032	23352.	7.090	0.340	0.680	50.230	0.900	40.550	0.050	0.060
11033	19856.	7.670	0.350	0.690	49.760	0.910	40.370	0.050	0.060
11034	14966.	9.080	0.390	0.800	48.730	0.980	39.840	0.050	0.060
11035	10791.	9.350	0.440	0.870	48.560	1.010	39.570	0.060	0.070
11036	5474.	9.570	0.490	0.920	48.410	1.010	39.380	0.060	0.070

BLAST CHEMISTRY REPORT

Kamloops quarry BC

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NUM	NA2O	TIO2	P2O5	CL-	NAEQ
11011	0.010	0.020	0.040	-1.000	0.030
11012	0.010	0.020	0.040	-1.000	0.030
11013	0.030	0.050	0.040	-1.000	0.090
11014	0.060	0.070	0.040	-1.000	0.160
11015	0.110	0.090	0.040	-1.000	0.310
11016	0.100	0.080	0.040	-1.000	0.270
11017	0.080	0.060	0.040	-1.000	0.210
11018	0.130	0.080	0.040	-1.000	0.340
11019	0.100	0.070	0.040	-1.000	0.260
11020	0.060	0.050	0.040	-1.000	0.160
11021	0.090	0.070	0.040	-1.000	0.260
11022	0.070	0.060	0.040	-1.000	0.190
11023	0.030	0.040	0.040	-1.000	0.100
11024	0.040	0.040	0.040	-1.000	0.120
11025	0.020	0.030	0.040	-1.000	0.070
11026	0.010	0.020	0.040	-1.000	0.040
11027	0.040	0.060	0.040	-1.000	0.140
11028	0.020	0.040	0.040	-1.000	0.080
11029	0.020	0.020	0.040	-1.000	0.070
11030	0.050	0.030	0.040	-1.000	0.120
11031	0.040	0.020	0.050	-1.000	0.070
11032	0.040	0.020	0.040	-1.000	0.070
11033	0.040	0.030	0.040	-1.000	0.060
11034	0.040	0.030	0.050	-1.000	0.060
11035	0.050	0.030	0.050	-1.000	0.070
11036	0.060	0.040	0.050	-1.000	0.080

BLAST CHEMISTRY REPORT
Kamloops quarry BC

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NUM	TON	SiO2	Al2O	Fe2O	CaO	MgO	LOI	SO3	K2O
12012	5434.	0.100	0.130	0.060	55.350	0.630	43.730	0.040	0.030
12013	5434.	0.090	0.130	0.050	55.360	0.640	43.780	0.040	0.030
12014	5433.	0.230	0.130	0.050	55.250	0.650	43.750	0.030	0.030
12015	10960.	0.330	0.170	0.100	55.090	0.700	43.680	0.030	0.040
12016	13115.	0.450	0.150	0.080	55.060	0.700	43.650	0.030	0.030
12017	15254.	0.750	0.160	0.110	54.910	0.700	43.520	0.030	0.030
12018	16677.	2.120	0.640	0.510	53.350	0.850	42.590	0.040	0.110
12019	16805.	2.670	0.880	0.710	52.620	0.950	42.180	0.050	0.150
12020	17564.	2.520	0.860	0.700	52.710	0.970	42.270	0.050	0.140
12021	18398.	2.400	0.840	0.680	52.810	0.990	42.360	0.050	0.130
12022	19242.	2.490	0.820	0.670	52.790	1.000	42.340	0.050	0.120
12023	20069.	2.330	0.780	0.630	52.930	0.980	42.430	0.060	0.120
12024	21130.	1.220	0.440	0.350	54.110	0.900	43.170	0.040	0.070
12025	21412.	0.970	0.390	0.290	54.330	0.880	43.320	0.040	0.060
12026	20972.	1.820	0.770	0.560	53.290	0.940	42.660	0.050	0.130
12027	21973.	1.050	0.510	0.370	54.150	0.860	43.150	0.040	0.080
12028	24935.	0.330	0.200	0.140	55.050	0.760	43.600	0.040	0.040
12029	23159.	2.420	0.240	0.320	53.610	0.760	42.620	0.050	0.040
12030	17287.	7.000	0.340	0.700	50.300	0.880	40.580	0.050	0.060
12031	14574.	9.230	0.390	0.850	48.650	0.980	39.700	0.050	0.060
12032	9857.	9.130	0.380	0.810	48.700	0.960	39.820	0.050	0.060
12033	4662.	9.150	0.390	0.820	48.720	0.960	39.770	0.050	0.060

BLAST CHEMISTRY REPORT

Kamloops quarry BC

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NUM	NA2O	TIO2	P2O5	CL-	NAEQ
12012	0.010	0.020	0.040	-1.000	0.030
12013	0.010	0.020	0.040	-1.000	0.030
12014	0.010	0.020	0.040	-1.000	0.030
12015	0.010	0.020	0.040	-1.000	0.040
12016	0.010	0.020	0.040	-1.000	0.030
12017	0.010	0.020	0.040	-1.000	0.030
12018	0.040	0.040	0.040	-1.000	0.120
12019	0.050	0.050	0.040	-1.000	0.150
12020	0.050	0.040	0.040	-1.000	0.140
12021	0.040	0.040	0.040	-1.000	0.130
12022	0.040	0.040	0.040	-1.000	0.120
12023	0.040	0.040	0.040	-1.000	0.120
12024	0.020	0.020	0.040	-1.000	0.070
12025	0.020	0.020	0.040	-1.000	0.070
12026	0.050	0.030	0.040	-1.000	0.140
12027	0.040	0.020	0.040	-1.000	0.100
12028	0.030	0.010	0.040	-1.000	0.050
12029	0.030	0.010	0.040	-1.000	0.060
12030	0.050	0.020	0.050	-1.000	0.070
12031	0.040	0.030	0.040	-1.000	0.070
12032	0.040	0.030	0.040	-1.000	0.060
12033	0.040	0.030	0.040	-1.000	0.070

BLAST RESERVES REPORT

KAMLOOPS LIMESTONE QUARRY 1993

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RESERVE INFORMATION

RESERVE FOR THE GROUP # 5
FROM BLAST 13000 TO BLAST 13998
NUMBER OF BLASTS = 14

TONNAGE TOTAL = 158186.

AVERAGE VALUE

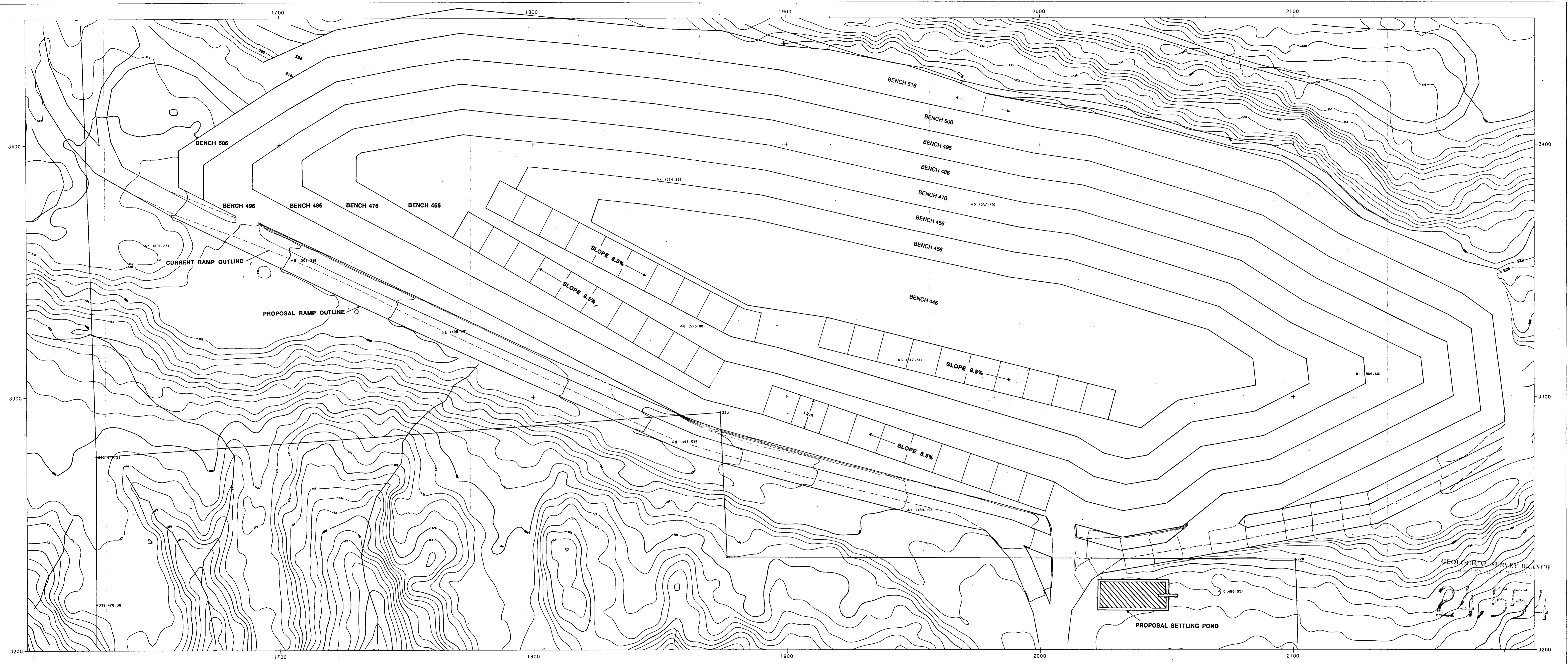
SiO2	Al2O	Fe2O	CaO	MgO	LOI	SO3	K2O
1.503	0.363	0.317	54.027	0.840	43.045	0.041	0.059

Na2O	TiO2	P2O5	CL-	HAZG
0.029	0.019	0.040	0.000	0.070

BLAST CHEMISTRY REPORT
Kamloops quarry BC

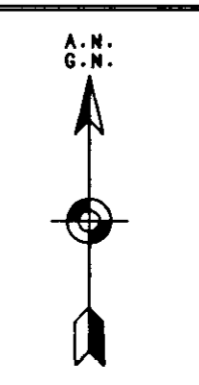
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NUM	NA2O	TIO2	P2O5	CL-	NAEQ
13013	0.150	0.120	0.050	-1.000	0.410
13014	0.010	0.020	0.040	-1.000	0.030
13015	0.010	0.010	0.040	-1.000	0.030
13016	0.010	0.010	0.040	-1.000	0.030
13017	0.010	0.010	0.040	-1.000	0.030
13018	0.010	0.010	0.040	-1.000	0.030
13019	0.010	0.010	0.040	-1.000	0.040
13020	0.030	0.030	0.040	-1.000	0.100
13021	0.060	0.040	0.040	-1.000	0.160
13022	0.020	0.010	0.040	-1.000	0.040
13023	0.030	0.010	0.040	-1.000	0.060
13024	0.040	0.010	0.040	-1.000	0.070
13025	0.050	0.020	0.040	-1.000	0.070
13026	0.050	0.030	0.040	-1.000	0.070



GEOLOGICAL SURVEY BRANCH
 MINING DIVISION

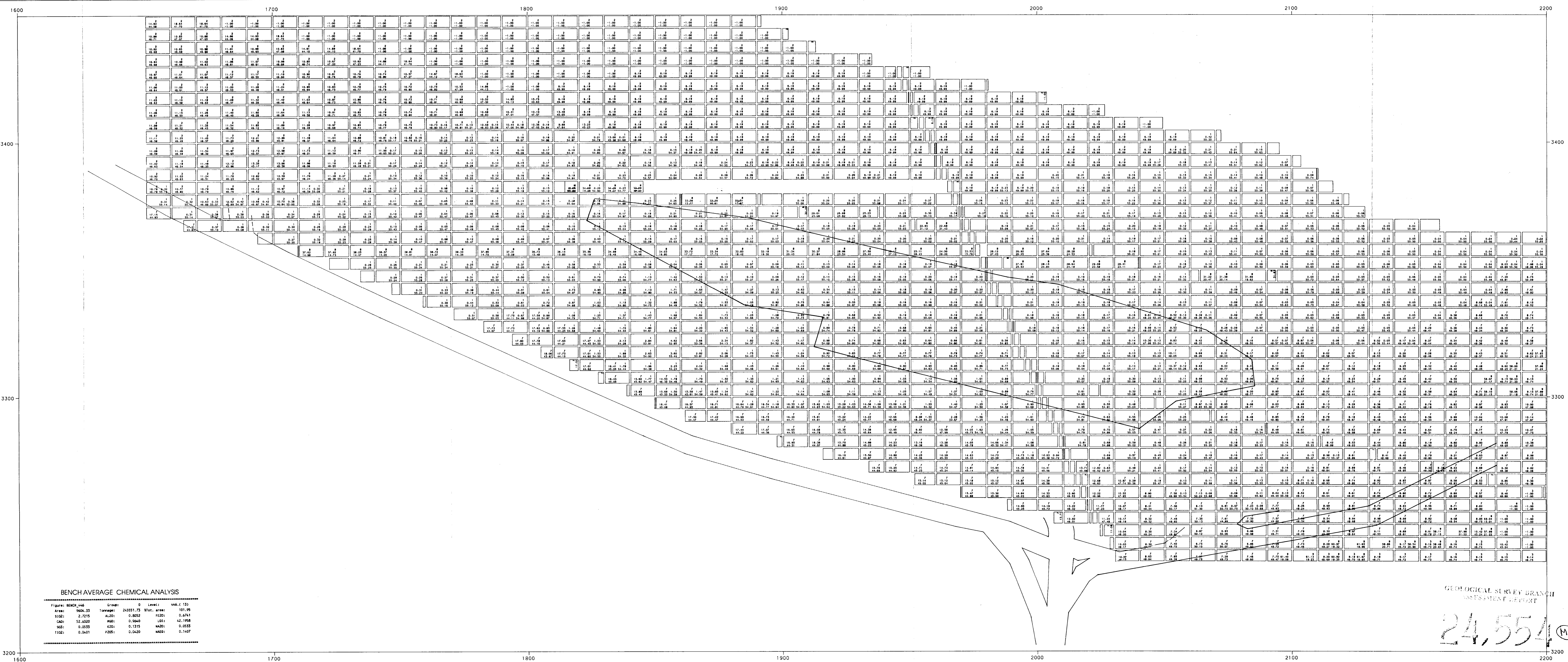
24,554



Drawn by	Date	Revised by	Date
ALAIN BEAUDET	APRIL 06, 1993		
DWC NO. 11422-1993-28			
SCALE 1 : 500			
10 5 0 10 20 30 40 50 meters			

Lafarge Canada Inc.
 Corporate Technical Services
LAFARGE CANADA INC.
 KAMLOOPS PLANT
 LIMESTONE QUARRY
 MINING PLAN DESIGN

SHEET 1000001-3-08 DATE 6-10-93 TIME 12:42:27

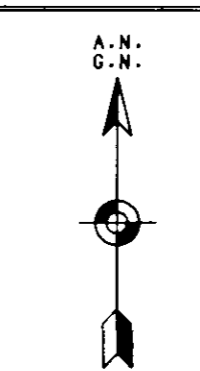


BENCH AVERAGE CHEMICAL ANALYSIS

Figure: BENCH_446	Group: 0	Level: 446 (13)
Area: 9604.33	Tonnage: 24551.73	Stot. area: 107.99
SIG2: 2.7215	AL2O3: 0.8052	FE2O3: 0.6741
CaO: 52.6320	MgO: 0.9640	LOI: 42.1958
SiO2: 0.0533	K2O: 0.1315	Na2O: 0.0533
TiO2: 0.0401	P2O5: 0.0420	Water: 0.1407

GEOLOGICAL SURVEY BRANCH
ENVIRONMENTAL REPORT

24,554 (Ma)

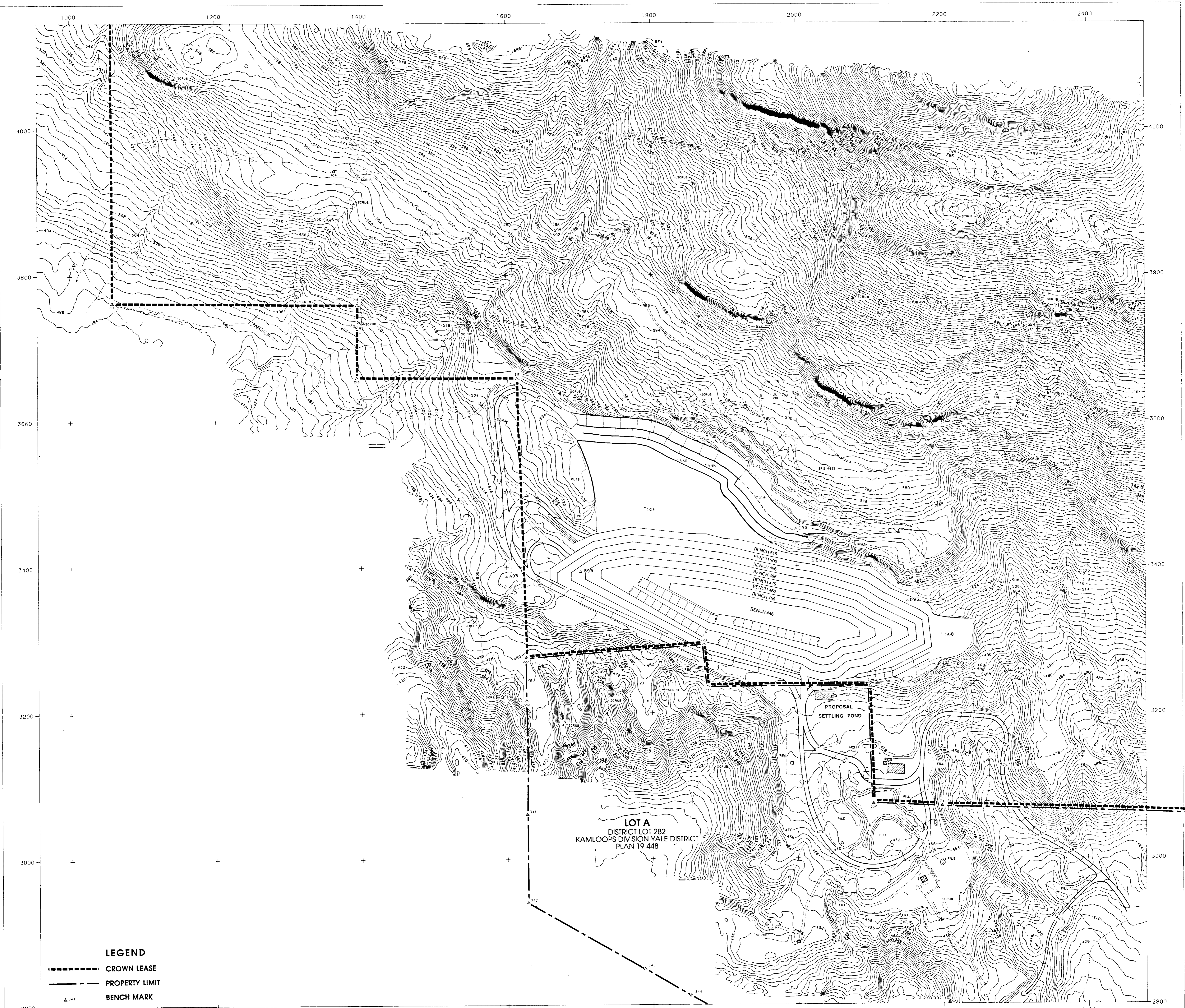


Drawn by	Date	Revised by	Date
A-BEAUDU	03/25/93		
DWC NO. 11422-1993-12			
SCALE 1 : 500			
10 5 0 10 20 30 40 50 meters			

Lafarge Canada Inc.
Corporate Technical Services

KAMLOOPS QUARRY BC. 1993

LIMESTONE QUARRY
BENCH 13
FROM 446.00 TO 456.00



LEGEND

- CROWN LEASE
- PROPERTY LIMIT
- ▲ BENCH MARK

LOT A
DISTRICT LOT 282
KAMLOOPS DIVISION YALE DISTRICT
PLAN 19 448

DIAMOND DRILL HOLES 1993

1701.80	3394.099303	(511.90)
1853.33	3420.719304	(515.45)
1729.44	3483.159305	(526.26)
1820.30	3480.819306	(526.16)
1902.08	3475.979307	(526.78)
1841.70	3477.599308	(528.43)
1963.09	3477.969309	(527.46)
1935.57	3496.899310	(557.91)
1756.03	3527.789311	(538.27)
1790.41	3565.619312	(543.03)

DIAMOND DRILL HOLES 1991

2125.17	3209.029111	(506.60)
1947.37	3255.219101	(499.19)
1764.35	3328.259102	(496.80)
1944.31	3314.529103	(517.51)
1849.28	3398.109104	(514.86)
1973.21	3276.089105	(517.75)
1858.48	3328.009106	(515.00)
1647.08	3360.259107	(507.75)
1705.12	3354.449108	(501.29)
1855.26	3292.519109	(495.09)
2070.53	3222.919110	(486.05)

PROPERTY B.M.

1057.88	4247.49P201	(542.02)
1362.82	4246.23P202	(644.95)
1667.95	4246.23P203	(711.44)
1931.63	4186.09P201	(763.49)
2581.86	4243.58P207	(887.18)
1115.54	4110.29P208	(860.30)
1253.64	3942.99P209	(663.83)
1667.07	3940.10P210	(603.03)
1971.80	3939.74P211	(676.15)
2276.02	3939.63P212	(790.82)
2581.08	3939.38P213	(741.86)

QUARRY B.M.

1058.25	3762.72P214	
1005.50	3815.72P214T	(488.57)
1395.17	3760.17P215	(509.49)
2593.26	3061.36P221	(441.67)
1615.31	3658.10P217	(530.03)
1971.56	3635.09P218	(594.71)
2278.24	3634.80P219	(632.32)
2580.91	3634.53P220	(657.05)
1627.40	3278.64P222	(479.52)
1873.84	3293.97P223	
1627.28	2937.69P342	(395.74)

QUARRY B.M.

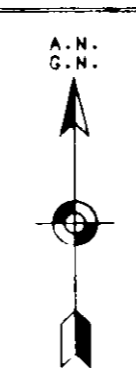
1600.10	3387.12 A93	(513.49)
1701.59	3394.09 B93	(512.10)
2100.81	3235.70P226	
2105.27	3074.69P229	
1910.72	2779.34P345	(410.24)
2061.98	2695.78P346	(387.34)
2579.83	2888.21P232	(433.74)
2199.50	2619.82P347	(373.02)
2578.68	2395.38P234	(800.32)
2641.09	2501.49P348	(365.99)
2079.54	3429.19 F93	(556.32)

QUARRY B.M.

1876.35	3226.68P227	
1789.75	2847.26P343	(417.35)
1852.66	2812.25P344	(416.32)
2100.81	3235.70P226	
2593.26	3061.36P221	(441.67)
2579.83	2888.21P232	(433.74)
2199.50	2619.82P347	(373.02)
2578.68	2395.38P234	(800.32)
2641.09	2501.49P348	(365.99)
2079.54	3429.19 F93	(556.32)

QUARRY B.M.

1600.10	3387.12 A93	(513.49)
1701.59	3394.09 B93	(512.10)
2100.81	3235.70P226	
2105.27	3074.69P229	
1910.72	2779.34P345	(410.24)
2061.98	2695.78P346	(387.34)
2579.83	2888.21P232	(433.74)
2199.50	2619.82P347	(373.02)
2578.68	2395.38P234	(800.32)
2641.09	2501.49P348	(365.99)
2079.54	3429.19 F93	(556.32)



Drawn by	Date	Revised by	Date
ALAIN BEAUDET	SEPT. 15, 1991	CTS	MARCH 04, 1993
DWG NO.			
SCALE 1 : 2000			
40 20 0 40 80 120 160 200 meters			

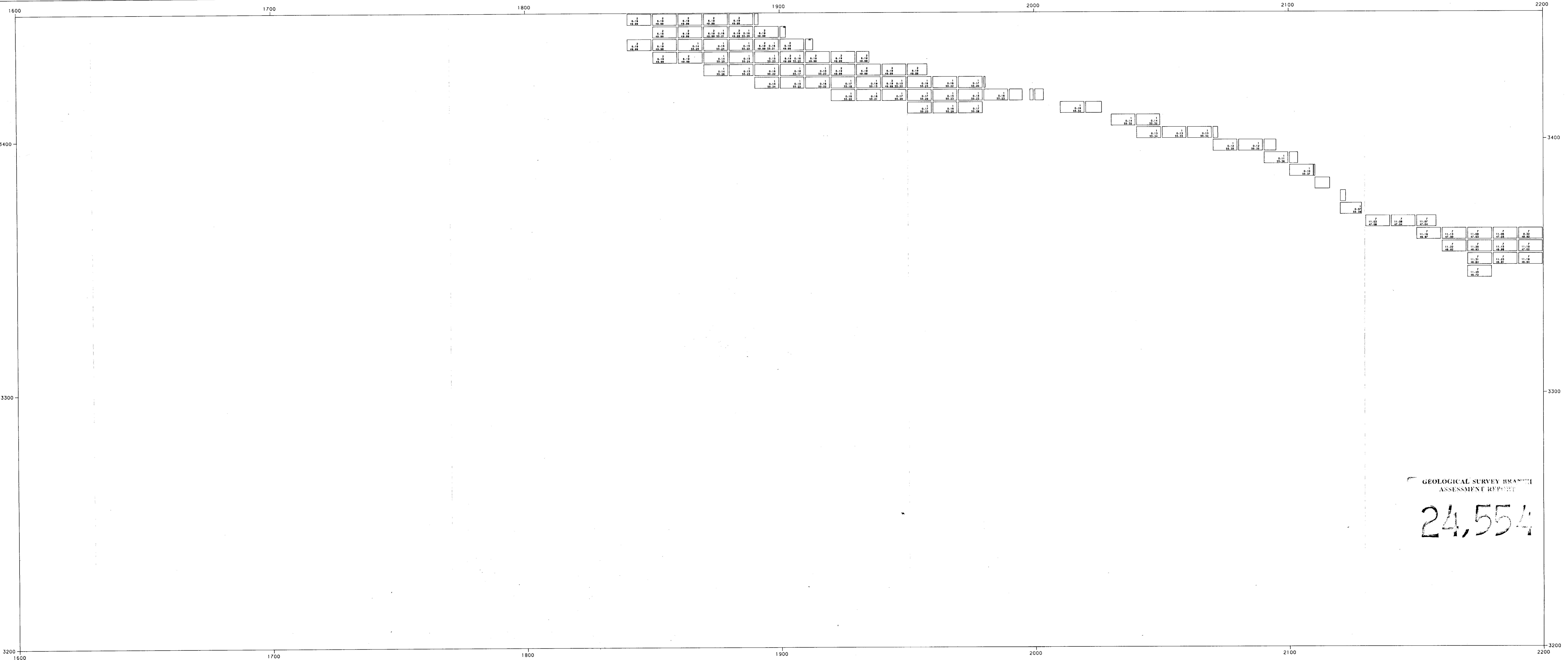
Lafarge Canada Inc.
Corporate Technical Services

LAFARGE CANADA INC.

KAMLOOPS PLANT
LIMESTONE QUARRY
FINAL QUARRY DESIGN

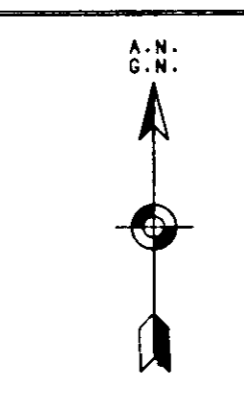
SURVEY BRANCH

24,554



GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

24,554



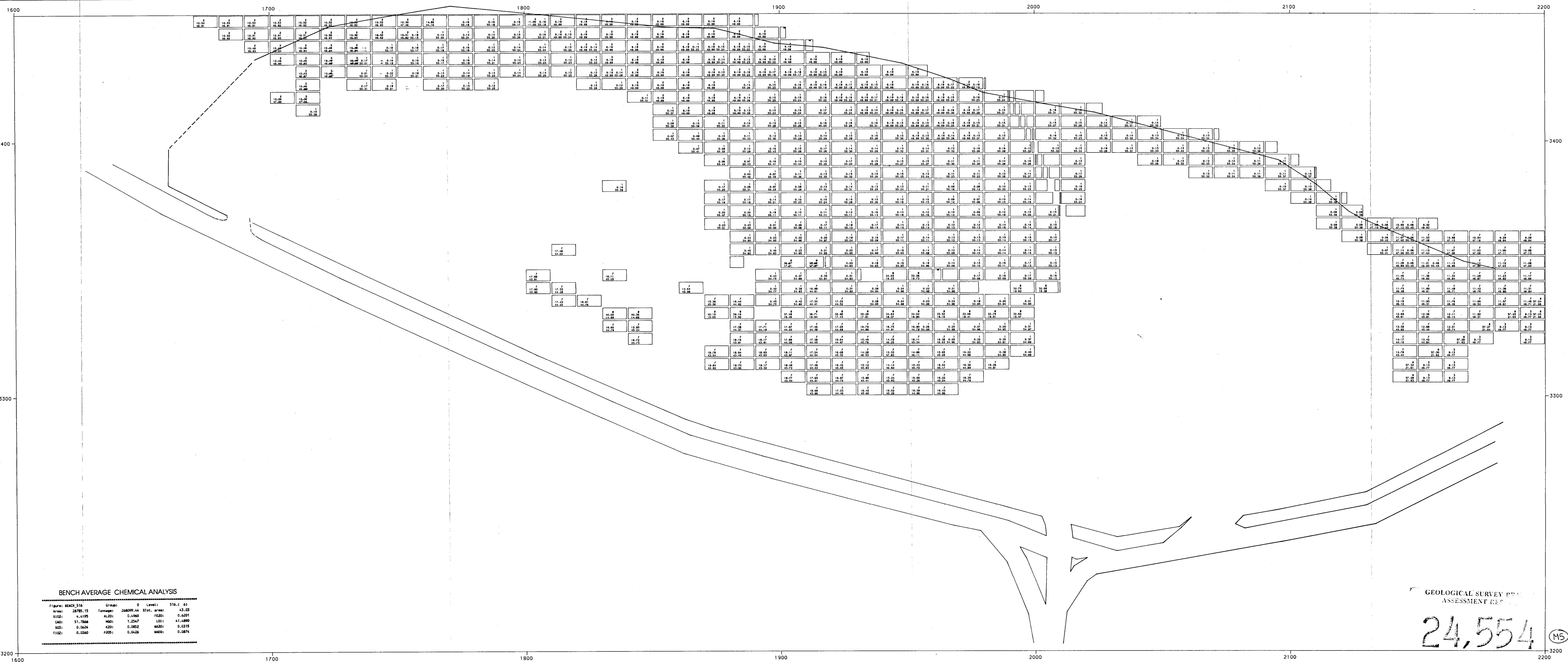
Drawn by	Date	Revised by	Date
A-BEAUDET	03/23/93		
DWG NO. 11422-1993-05			
SCALE 1 : 500			
10 5 0 10 20 30 40 50 meters			

Lafarge Canada Inc.
Corporate Technical Services

KAMLOOPS QUARRY BC. 1993

(M4) LIMESTONE QUARRY
BENCH 5
FROM 526.00 TO 536.00

DATE 03/23/93 TIME 10:41:41

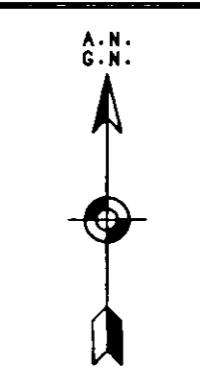


BENCH AVERAGE CHEMICAL ANALYSIS

Figure: BECH_516	Group: 0	Level: 516.1 6)
Area: 28795.15	Tonnage: 26809.44	Total area: 43.03
S102: 4.4195	AL2O3: 0.4965	FE2O3: 0.4201
CaO: 51.7866	MgO: 1.2547	LOI: 41.4890
SiO2: 0.0624	K2O: 0.0852	MnO: 0.0315
Fluor: 0.0360	P2O5: 0.0426	HAER: 0.0874

GEOLOGICAL SURVEY OF CANADA
ASSESSMENT REPORT

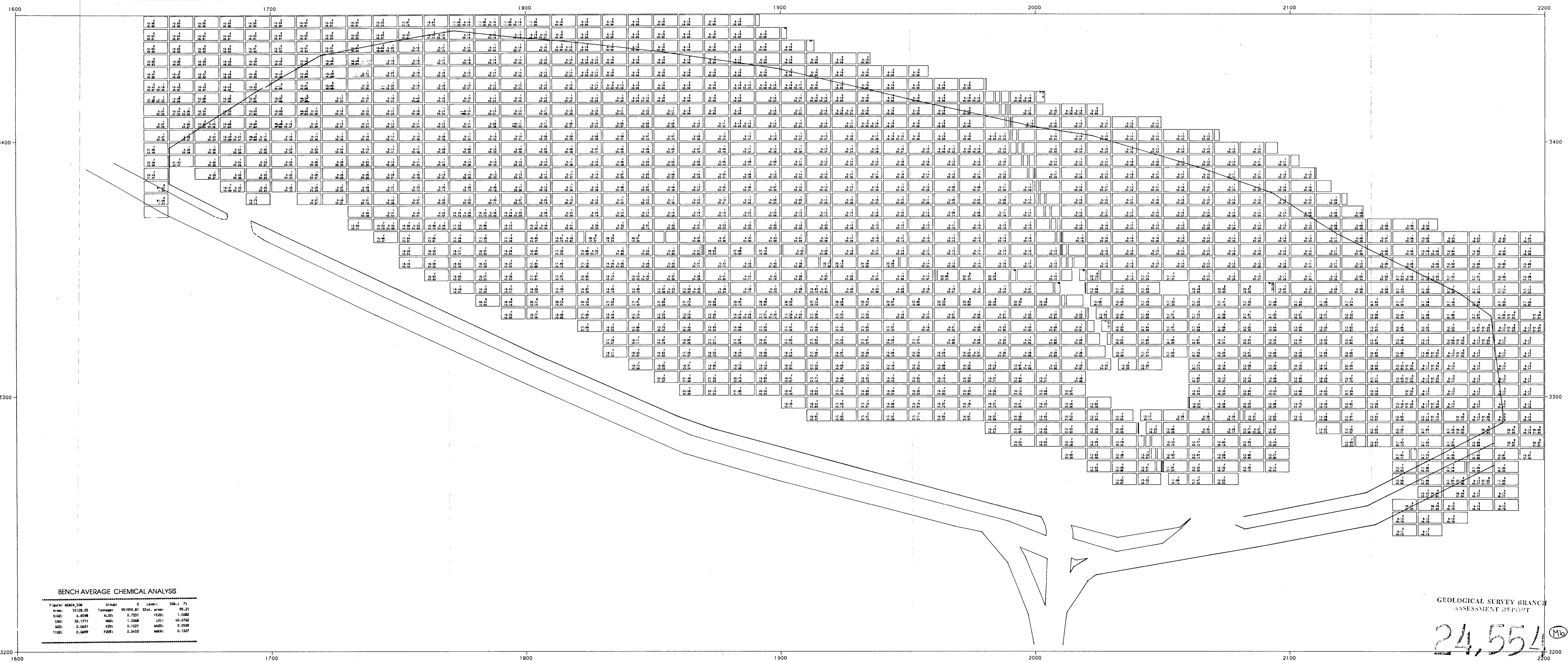
24,554 (MS)



Drawn by	Date	Revised by	Date
A-BEAUDET	03/23/93		
DWG NO. 11422-1993-06			
SCALE 1 = 500			
10 5 0 10 20 30 40 50 meters			

Lafarge Canada Inc.
Corporate Technical Services
KAMLOOPS QUARRY BC. 1993
LIMESTONE QUARRY
BENCH 6
FROM 516.00 TO 526.00

DATE 03/23/93 TIME 10:37

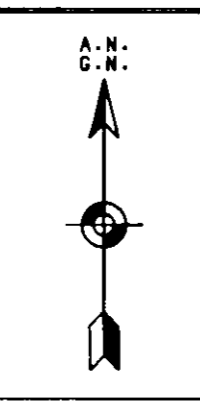


BENCH AVERAGE CHEMICAL ANALYSIS

Figure: BECH_506	Group: 0	Level: 506.1 7)
Area: 55126.05	Tonnage: 95199.81	XTot. Area: 90.21
S102: 0.8098	Al2O3: 0.7331	Fe2O3: 1.0082
CaO: 56.1711	MgO: 1.3568	LOI: 40.0762
SiO2: 0.0631	K2O: 0.1221	Na2O: 0.0500
TiO2: 0.0099	P2O5: 0.0453	BAO: 0.1327

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

24,551 (M6)

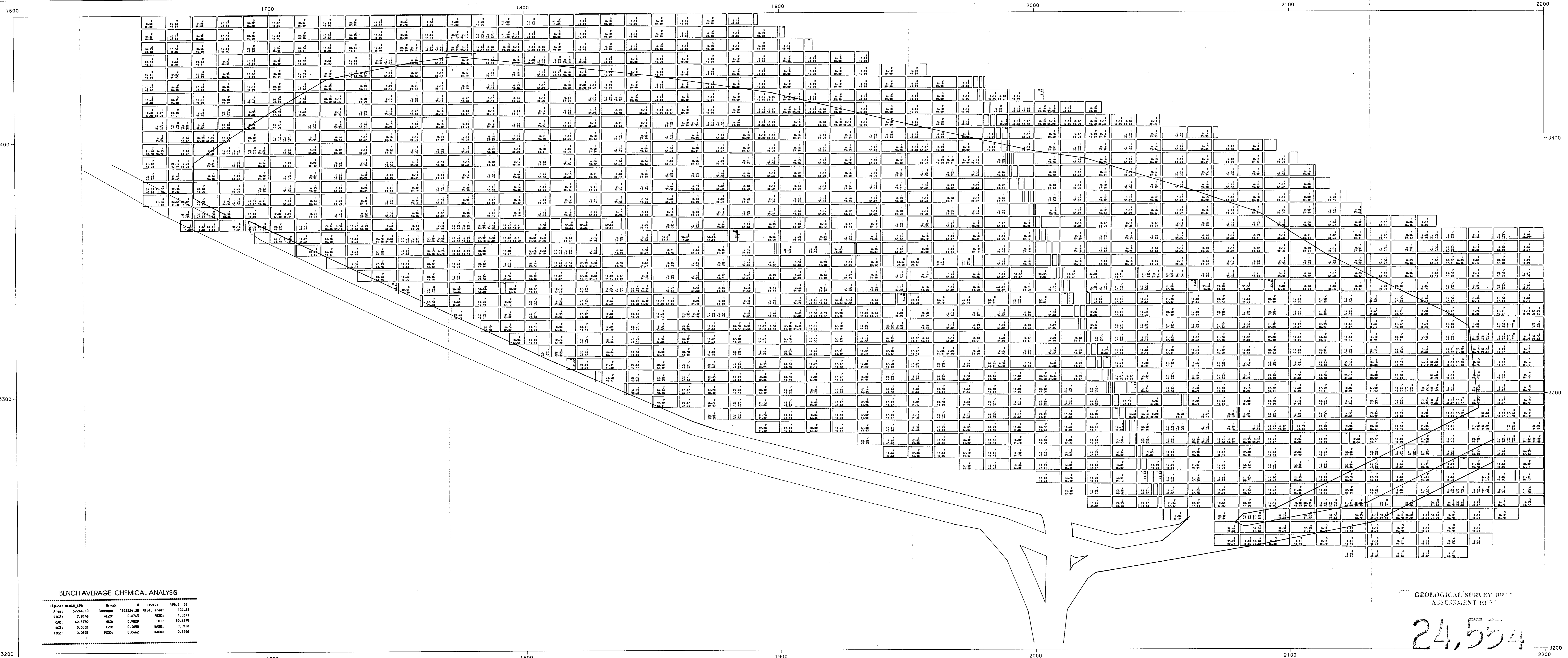


Drawn by	Date	Revised by	Date
A-BEAUDET	03/24/93		
DWG NO. 11422-1993-07			
SCALE 1 : 500			
10 5 0 10 20 30 40 50 meters			

Lafarge Canada Inc.
Corporate Technical Services

KAMLOOPS QUARRY BC. 1993

LIMESTONE QUARRY
BENCH 7
FROM 506.00 TO 516.00



BENCH AVERAGE CHEMICAL ANALYSIS

Figure:	Group:	Level:	496.1 B)
Area:	57244.10	Tonnage:	131354.38
S102:	7.0166	AL2O3:	0.4763
CaO:	49.5799	Fe2O3:	1.0371
SiO2:	0.0583	CaO:	0.1050
Fe2O3:	0.0592	MgO:	0.0526
		P2O5:	0.1166

GEOLOGICAL SURVEY REPORT
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24,554

Drawn by	Date	Revised by	Date
A-BEAUDET	03/24/93		

DWG NO. 11422-1993-08

SCALE 1 : 500

10 5 0 10 20 30 40 50 meters

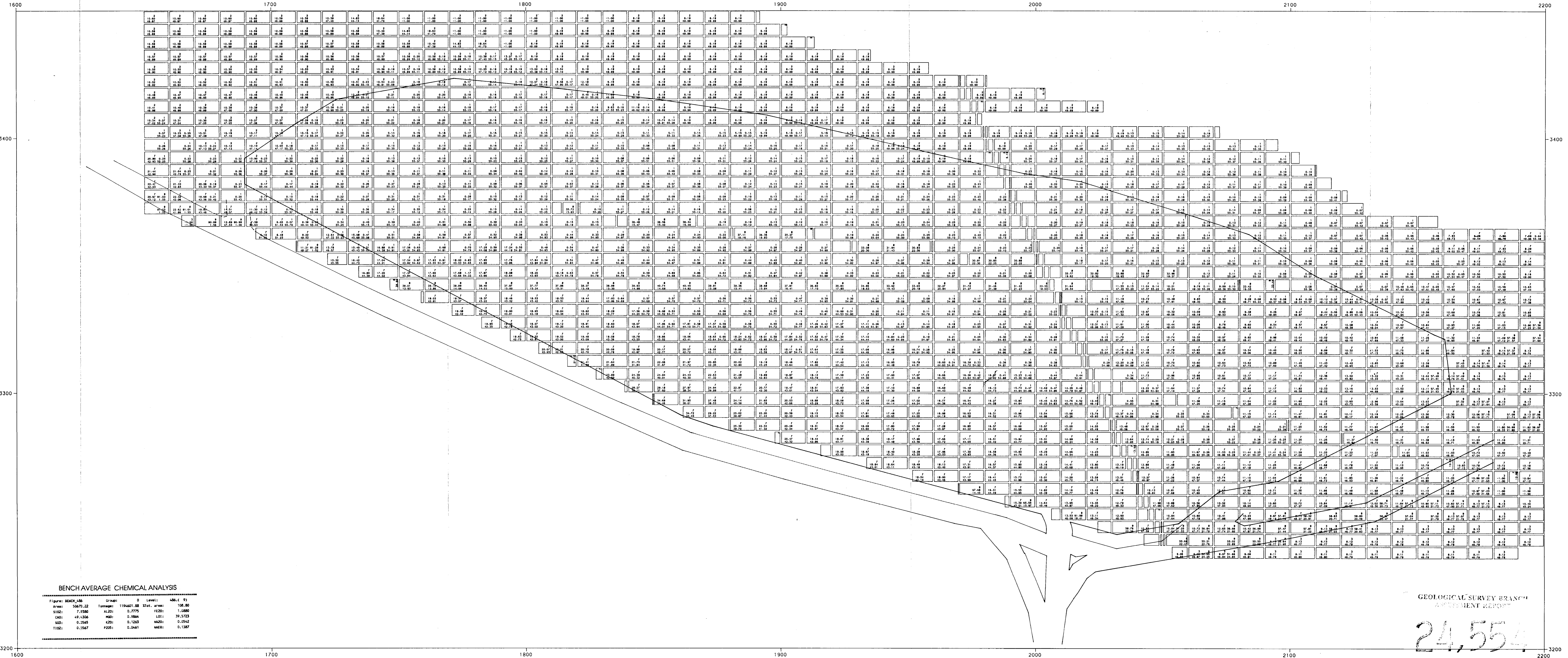
Lafarge Canada Inc.
Corporate Technical Services

KAMLOOPS QUARRY BC. 1993

LIMESTONE QUARRY
BENCH 8

FROM 496.00 TO 506.00

M7

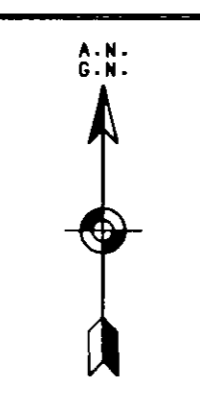


BENCH AVERAGE CHEMICAL ANALYSIS

Figure:	BEHC_426	Group:	0	Level:	466.6 9)
Area:	50670.22	Tonnage:	1194601.88	Tot. area:	108.80
SiO2:	7.7580	Al2O3:	0.7775	Fe2O3:	1.0880
CaO:	49.1306	MgO:	0.9664	LOI:	39.3723
SO3:	0.2566	K2O:	0.1263	Na2O:	0.2542
TiO2:	0.3567	P2O5:	0.0461	MO:	0.1587

GEOLOGICAL SURVEY BRANCH
ANNUAL REPORT

24,554



Drawn by	Date	Revised by	Date
A-BEAUDET	03/24/93		

DWC NO. 11422-1993-09

SCALE 1" = 500

10 5 0 10 20 30 40 50 meters

Lafarge Canada Inc.
Corporate Technical Services

KAMLOOPS QUARRY BC. 1993

LIMESTONE QUARRY
BENCH 9

FROM 486.00 TO 496.00

DATE 24-MAR-93 TIME 10:41

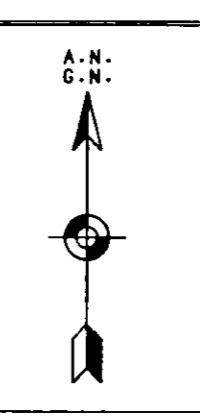


BENCH AVERAGE CHEMICAL ANALYSIS

Figure: BENCH_476	Group: 0	Level: 476.0
Area: 3956.77	Volume: 96733.44	Stoc. area: 106.90
SIG: 6.5079	AL2O3: 0.8664	FE2O3: 1.0243
CAD: 50.1808	MgO: 0.9859	LOI: 40.2402
MO: 0.0074	CaO: 0.1402	Na2O: 0.0552
TI02: 0.0039	P2O5: 0.0649	Wt%: 0.1566

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

24,554

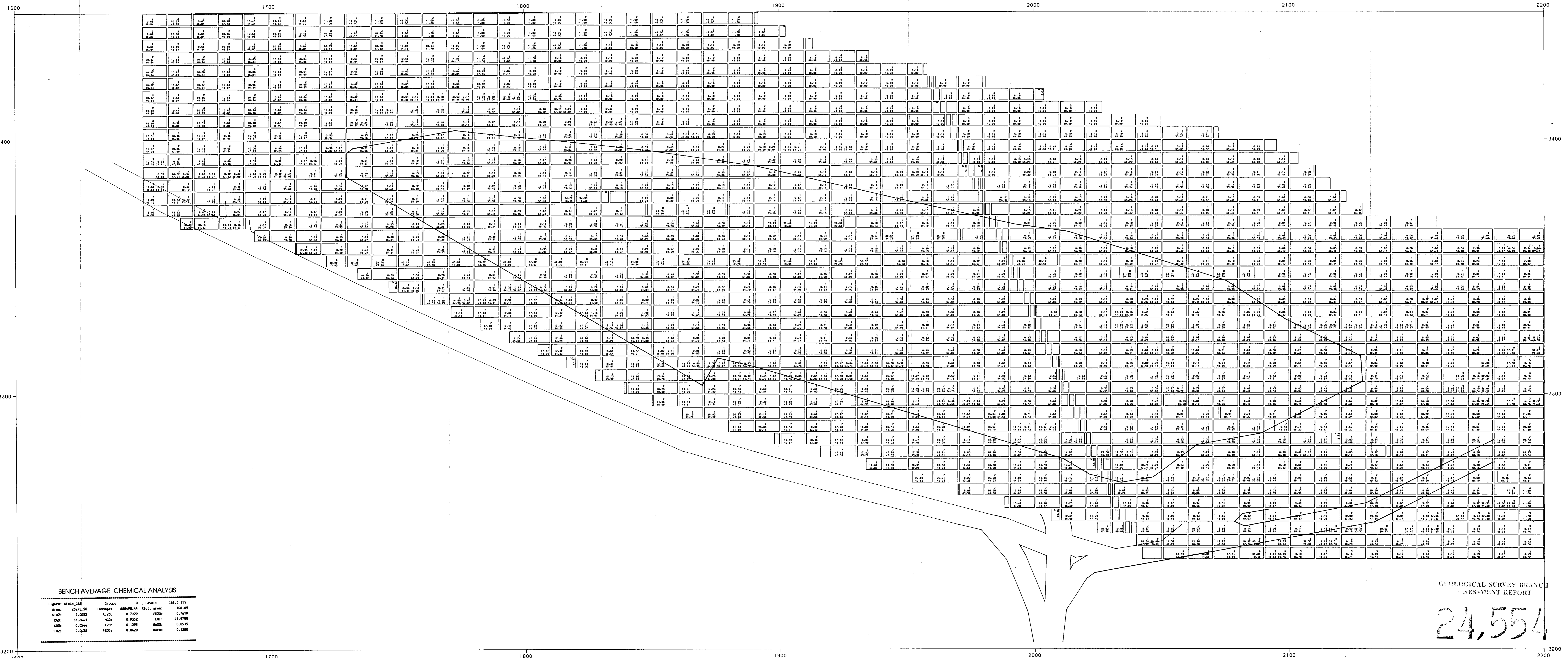


Drawn by	Date	Revised by	Date
A-BEAUD	03/24/93		
DWC NO. 11422-1993-10			
SCALE 1 : 500			
10 5 0 10 20 30 40 50 meters			

Lafarge Canada Inc. Corporate Technical Services	
KAMLOOPS QUARRY BC. 1993	
LIMESTONE QUARRY	
BENCH 10	
FROM 476.00 TO 486.00	

M9

DATE 3-24-93 TIME 15:04

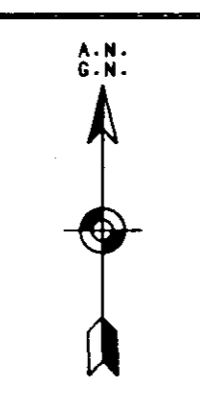


BENCH AVERAGE CHEMICAL ANALYSIS

Figure:	BENCH_466	Group:	0	Level:	466 (15)
Area:	26272.50	Turnover:	688490.64	Rate:	106.29
SIQ:	4.0092	ALQ:	0.7929	FEQ:	0.7619
CAQ:	51.8641	MQ:	0.9352	LO:	41.5755
SO:	0.0644	KQ:	0.1299	MAQ:	0.0515
TIQ:	0.0438	PQ:	0.0429	MAQ:	0.1350

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

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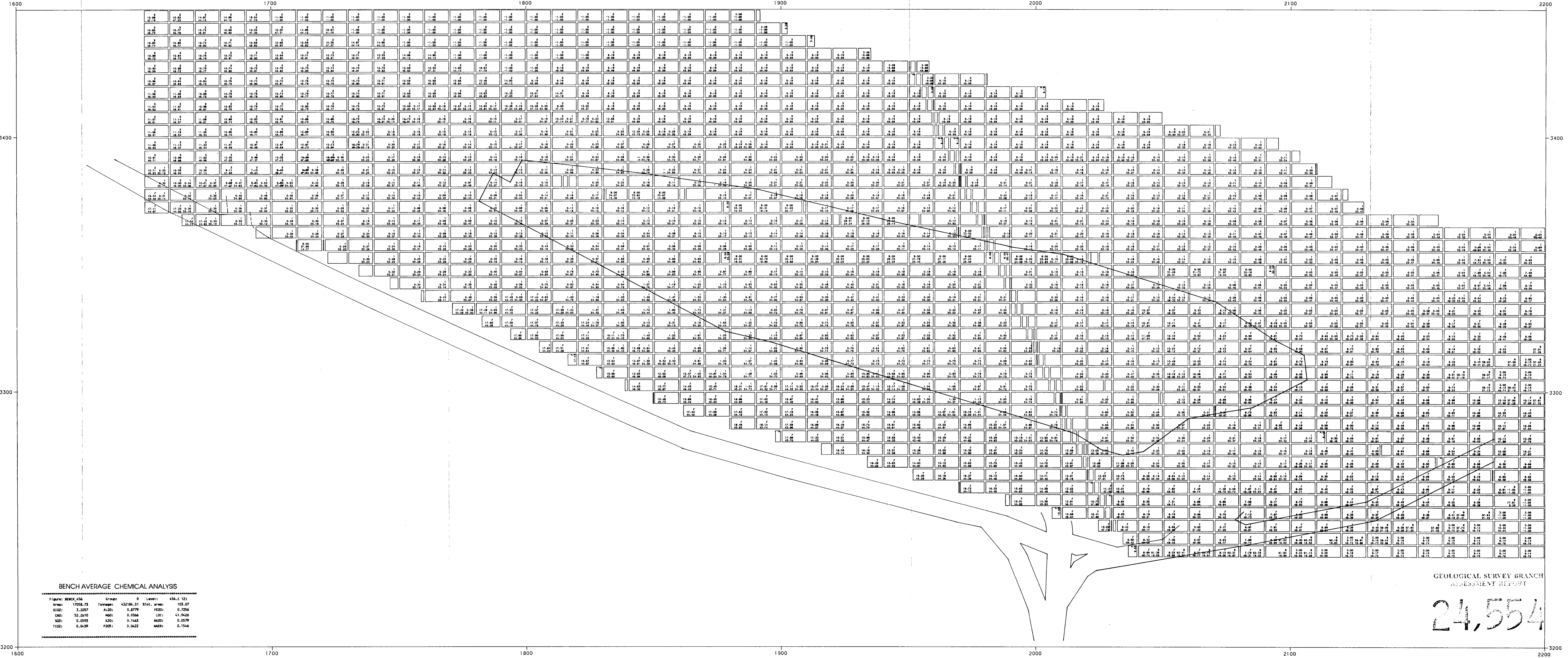


Drawn by	Date	Revised by	Date
A-BEAUDET	03/25/93		
DWC NO.	11422-1993-11		
SCALE 1" = 500			
10 5 0 10 20 30 40 50 meters			

Lafarge Canada Inc.
Corporate Technical Services
KAMLOOPS QUARRY BC. 1993
LIMESTONE QUARRY
BENCH 11
FROM 466.00 TO 476.00

M10

DATE 25-MAR-93 TIME 10:42:02



BENCH AVERAGE CHEMICAL ANALYSIS

Figure: BENCH_456 Groups: 0 Level: 456.4 12)

Area: 17058.73 Tonnage: 432194.31 Tot. area: 103.07

SIGD: 3.2077 ALDZ: 0.8779 REDZ: 0.7254

CAZ: 52.2610 MGD: 0.3564 LOZ: 41.9426

SOS: 0.0593 KZD: 0.1463 MAZD: 0.0579

TI02: 0.0439 PZDZ: 0.0422 MAZD: 0.1546

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

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Limestone Quarry
BENCH 12
FROM 456.00 TO 466.00

Drawn by: A-BEAUDET Date: 03/23/93

DWG NO.: 11422-1993-04

SCALE 1 : 500

10 5 0 10 20 30 40 50 meters

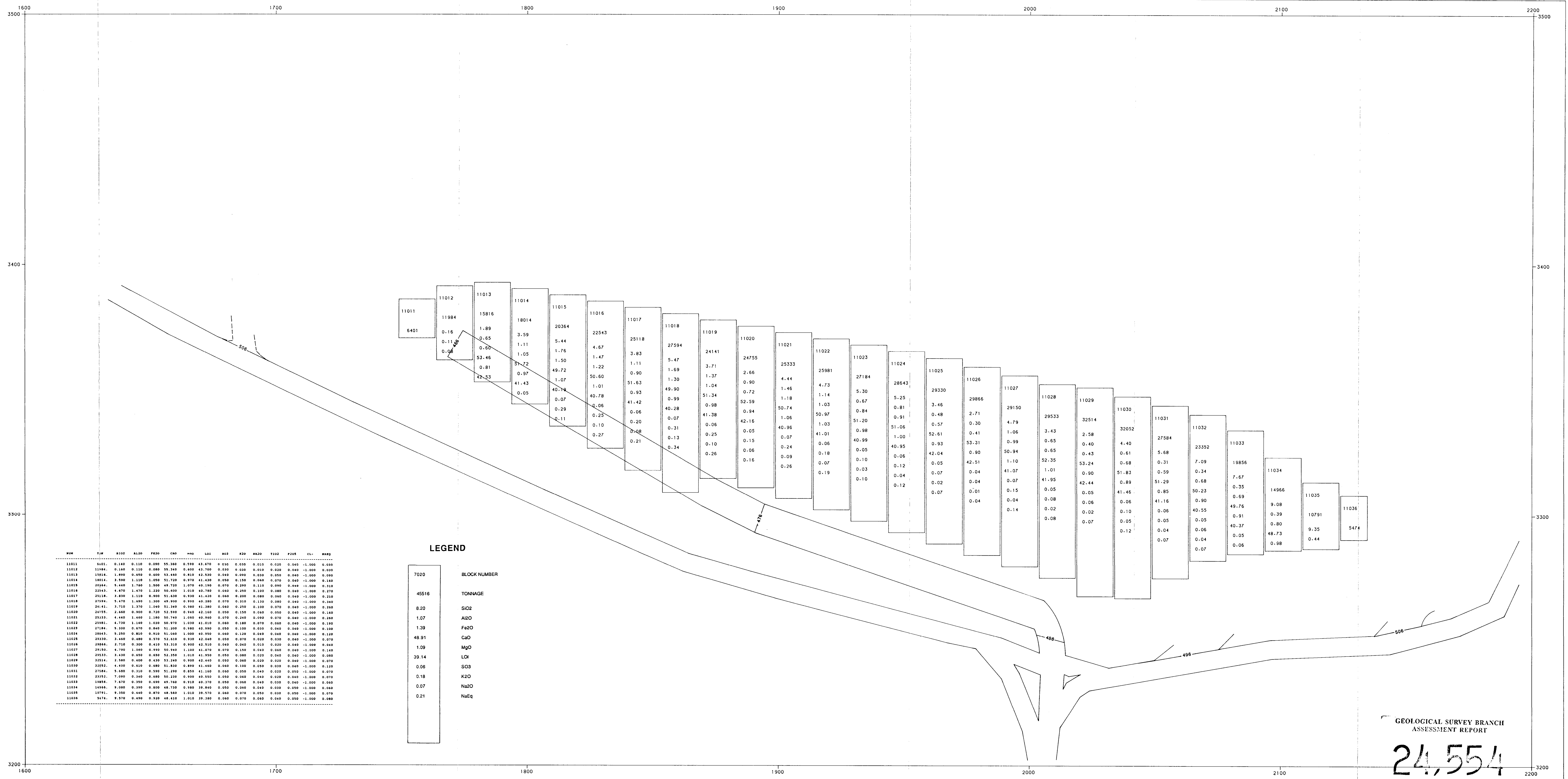
Revised by: _____ Date: _____

Lafarge Canada Inc.
Corporate Technical Services

KAMLOOPS QUARRY BC. 1993

(M11)

DATE 31-03-93



NUM	TUN	SiO2	Al2O3	Fe2O3	CaO	MgO	LOI	SO3	K2O	Na2O	CL-	NaEq
11011	5401	0.140	0.110	0.090	55.360	0.590	43.470	0.030	0.030	0.040	-1.000	0.030
11012	11984	0.160	0.110	0.080	55.340	0.400	43.100	0.030	0.030	0.040	-1.000	0.030
11013	15816	1.890	0.450	0.600	53.460	0.810	42.330	0.040	0.050	0.040	-1.000	0.090
11014	18014	3.590	1.110	1.050	51.720	0.970	41.430	0.050	0.150	0.040	-1.000	0.180
11015	20364	5.440	1.760	1.300	49.720	1.070	40.190	0.070	0.290	0.110	-1.000	0.310
11016	22543	7.110	2.220	1.650	47.720	1.170	38.950	0.080	0.410	0.160	-1.000	0.440
11017	25118	8.780	2.680	2.000	45.720	1.270	37.710	0.090	0.530	0.230	-1.000	0.570
11018	27594	10.450	3.140	2.350	43.720	1.370	36.470	0.100	0.650	0.300	-1.000	0.700
11019	24141	12.120	3.600	2.700	41.720	1.470	35.230	0.110	0.770	0.370	-1.000	0.830
11020	24755	13.790	4.060	3.050	39.720	1.570	33.990	0.120	0.890	0.440	-1.000	0.960
11021	25333	15.460	4.520	3.400	37.720	1.670	32.750	0.130	1.010	0.510	-1.000	1.090
11022	25981	17.130	4.980	3.750	35.720	1.770	31.510	0.140	1.130	0.580	-1.000	1.220
11023	27184	18.800	5.440	4.100	33.720	1.870	30.270	0.150	1.250	0.650	-1.000	1.350
11024	28643	20.470	5.900	4.450	31.720	1.970	29.030	0.160	1.370	0.720	-1.000	1.480
11025	29330	22.140	6.360	4.800	29.720	2.070	27.790	0.170	1.490	0.790	-1.000	1.610
11026	29866	23.810	6.820	5.150	27.720	2.170	26.550	0.180	1.610	0.860	-1.000	1.740
11027	29150	25.480	7.280	5.500	25.720	2.270	25.310	0.190	1.730	0.930	-1.000	1.870
11028	29533	27.150	7.740	5.850	23.720	2.370	24.070	0.200	1.850	1.000	-1.000	2.000
11029	32514	28.820	8.200	6.200	21.720	2.470	22.830	0.210	1.970	1.070	-1.000	2.130
11030	32052	30.490	8.660	6.550	19.720	2.570	21.590	0.220	2.090	1.140	-1.000	2.260
11031	27584	32.160	9.120	6.900	17.720	2.670	20.350	0.230	2.210	1.210	-1.000	2.390
11032	23352	33.830	9.580	7.250	15.720	2.770	19.110	0.240	2.330	1.280	-1.000	2.520
11033	19856	35.500	10.040	7.600	13.720	2.870	17.870	0.250	2.450	1.350	-1.000	2.650
11034	14966	37.170	10.500	7.950	11.720	2.970	16.630	0.260	2.570	1.420	-1.000	2.780
11035	10791	38.840	10.960	8.300	9.720	3.070	15.390	0.270	2.690	1.490	-1.000	2.910
11036	5474	40.510	11.420	8.650	7.720	3.170	14.150	0.280	2.810	1.560	-1.000	3.040

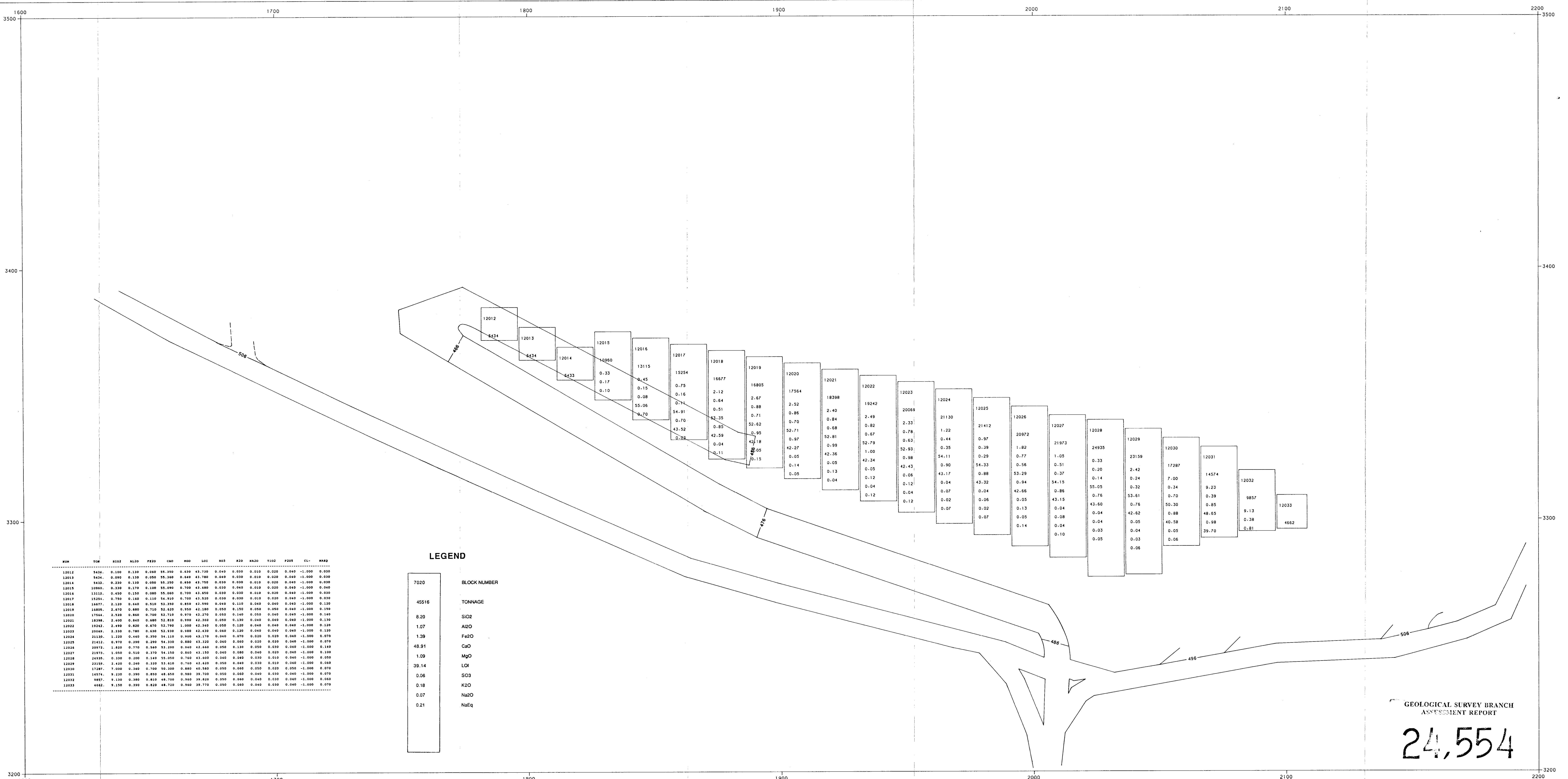
LEGEND

7020	BLOCK NUMBER
45516	TONNAGE
8.20	SiO2
1.07	Al2O3
1.39	Fe2O3
48.91	CaO
1.09	MgO
39.14	LOI
0.06	SO3
0.18	K2O
0.07	Na2O
0.21	NaEq

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

24,554

Drawn by A-BEAUDET	Date 10/26/93	Revised by	Date
DWG NO. 11422-1993-17		Lafarge Canada Inc. Corporate Technical Services	
SCALE 1 : 500		KAMLOOPS QUARRY BC. 1993	
10 5 0 10 20 30 40 50 meters		LIMESTONE QUARRY BENCH 466 level 11 FROM 466.00 TO 476.00	



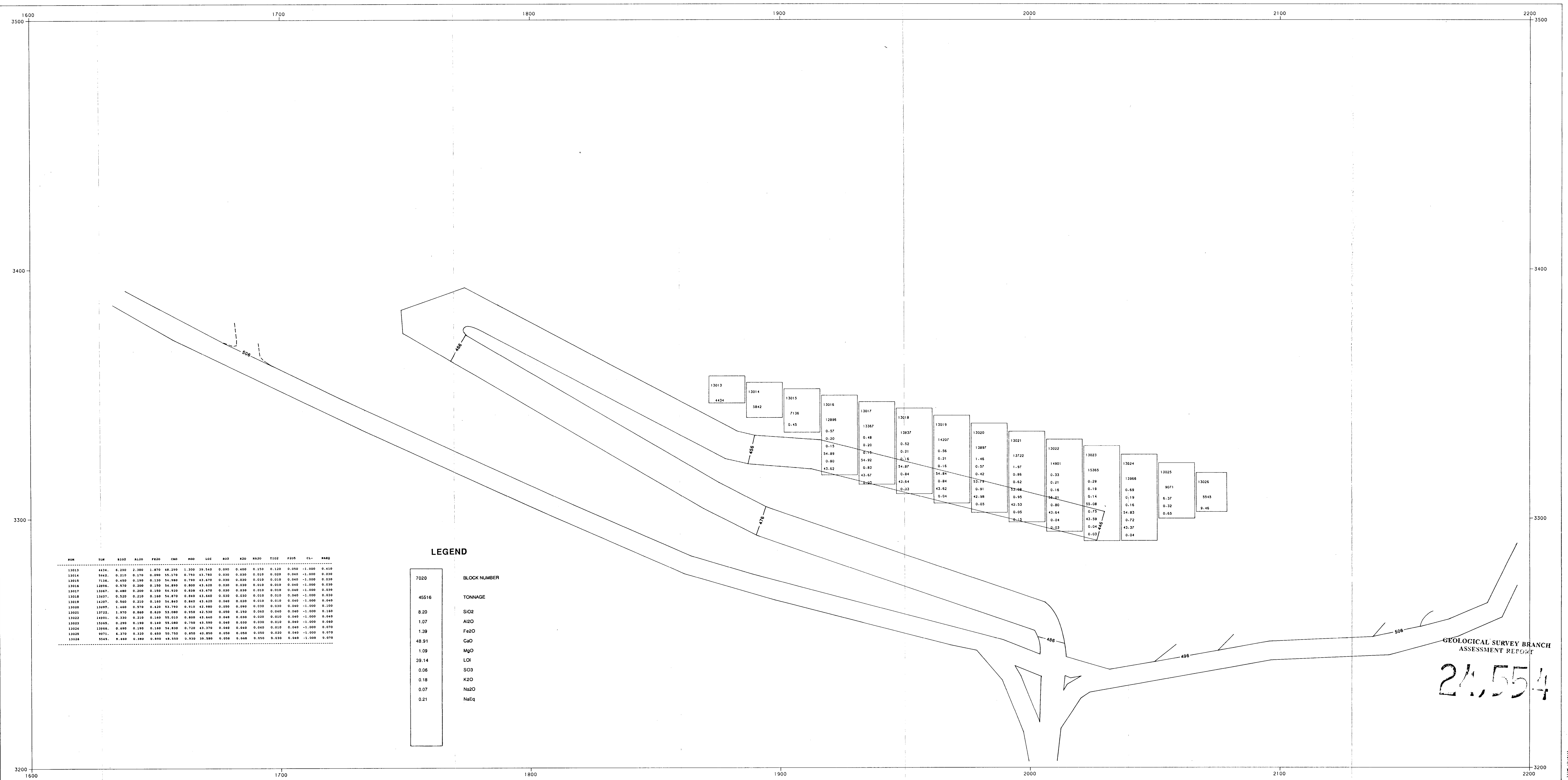
BLOCK	SiO2	Al2O3	Fe2O3	CaO	MgO	LOI	SO3	K2O	Na2O	NaEq	CL	WGT	
12012	0.100	0.130	0.040	35.350	0.630	43.730	0.040	0.030	0.010	0.020	0.040	-1.000	0.030
12013	0.090	0.130	0.050	35.340	0.640	43.780	0.040	0.030	0.010	0.020	0.040	-1.000	0.030
12014	0.230	0.150	0.050	35.250	0.650	43.750	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12015	0.330	0.170	0.100	35.090	0.700	43.680	0.030	0.040	0.010	0.020	0.040	-1.000	0.040
12016	0.450	0.150	0.080	35.060	0.700	43.850	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12017	0.750	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12018	1.6677	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12019	2.67	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12020	17564	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12021	18398	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12022	19242	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12023	20069	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12024	21130	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12025	21412	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12026	20972	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12027	21973	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12028	24935	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12029	23159	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12030	17287	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12031	14574	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12032	9857	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
12033	4662	0.140	0.110	34.910	0.700	43.910	0.030	0.030	0.010	0.020	0.040	-1.000	0.030

LEGEND

7020	BLOCK NUMBER
45516	TONNAGE
8.20	SiO2
1.07	Al2O3
1.39	Fe2O3
48.91	CaO
1.09	MgO
39.14	LOI
0.06	SO3
0.18	K2O
0.07	Na2O
0.21	NaEq

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT
24,554

Drawn by A-BEAUDET	Date 10/26/93	Revised by	Date
DWG NO. 11422-1993-18			
SCALE 1 : 500			
10 5 0 10 20 30 40 50 meters			
Canada Inc. Corporate Technical Services KAMLOOPS QUARRY BC. 1993 LIMESTONE QUARRY M13 BENCH 456 level 12 FROM 456.00 TO 466.00			



BLOCK	TUM	R102	AL2O	FE2O	CaO	MgO	LOI	SO3	K2O	Na2O	TiO2	P2O5	CL	MARK
13013	4434	6.200	2.300	1.870	48.280	1.300	39.540	0.090	0.400	0.150	0.120	0.050	-1.000	0.410
13014	5842	0.210	0.170	0.090	55.170	0.750	43.780	0.030	0.030	0.010	0.020	0.040	-1.000	0.030
13015	7136	0.450	0.190	0.130	54.980	0.750	43.670	0.030	0.030	0.010	0.010	0.040	-1.000	0.030
13016	12896	0.570	0.200	0.150	54.850	0.800	43.620	0.030	0.030	0.010	0.010	0.040	-1.000	0.030
13017	13367	0.480	0.200	0.150	54.920	0.830	43.670	0.030	0.030	0.010	0.010	0.040	-1.000	0.030
13018	13367	0.520	0.210	0.160	54.870	0.840	43.640	0.030	0.030	0.010	0.010	0.040	-1.000	0.030
13019	14207	0.560	0.210	0.160	54.840	0.840	43.620	0.040	0.030	0.010	0.010	0.040	-1.000	0.030
13020	13897	1.460	0.570	0.420	53.750	0.910	42.980	0.050	0.030	0.010	0.040	-1.000	0.100	
13021	13722	1.970	0.860	0.620	53.080	0.950	42.530	0.050	0.150	0.060	0.040	0.040	-1.000	0.160
13022	14901	0.330	0.210	0.160	55.010	0.800	43.640	0.040	0.030	0.010	0.010	0.040	-1.000	0.040
13023	15365	0.290	0.190	0.140	55.080	0.750	43.590	0.040	0.030	0.010	0.010	0.040	-1.000	0.040
13024	13966	0.690	0.190	0.160	54.830	0.720	43.370	0.040	0.040	0.010	0.010	0.040	-1.000	0.070
13025	9071	6.370	0.220	0.650	50.750	0.850	40.850	0.050	0.050	0.020	0.020	0.040	-1.000	0.070
13026	3545	8.460	0.200	0.650	48.250	0.920	38.580	0.050	0.040	0.020	0.020	0.040	-1.000	0.070

LEGEND

7020	BLOCK NUMBER
45516	TONNAGE
8.20	SiO2
1.07	Al2O
1.39	Fe2O
48.91	CaO
1.09	MgO
39.14	LOI
0.06	SO3
0.18	K2O
0.07	Na2O
0.21	NaEq

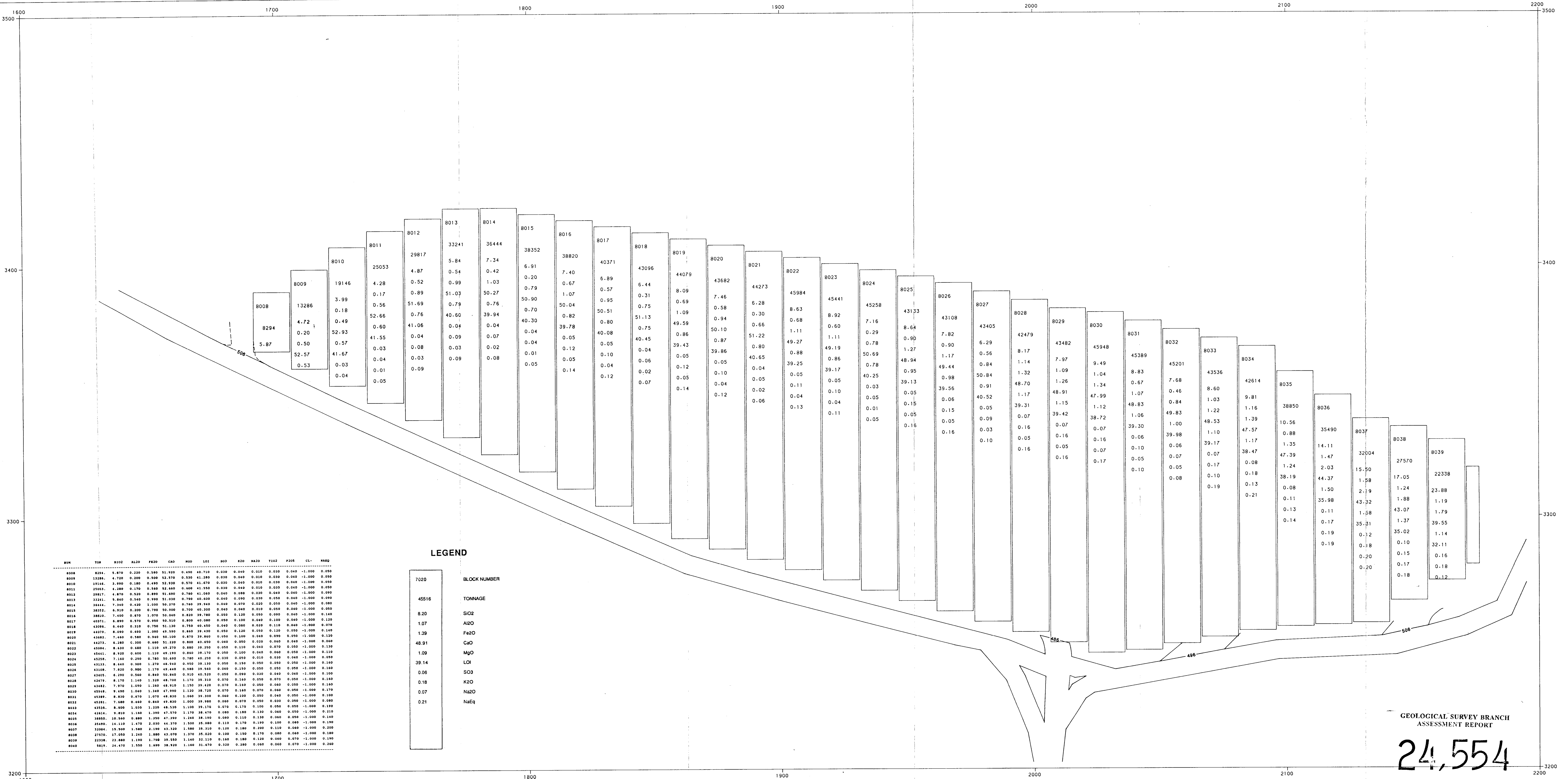
GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

24.554

Drawn by A-BEAUDET	Date 10/26/93	Revised by	Date
DWG NO. 11422-1993-19		KAMLOOPS QUARRY BC. 1993	
SCALE 1 : 500			
10 5 0 10 20 30 40 50 meters			
Limestone Quarry		BENCH 446 level 13	
FROM 446.00		TO 456.00	

Lafarge Canada Inc.
Corporate Technical Services

M14



BWN	TON	SIQ2	AI2O	Fe2O	CaO	MgO	LOI	SO3	K2O	Na2O	F2O5	P2O5	CL-	Hard
8008	5.87	0.220	0.580	51.920	0.490	40.710	0.030	0.040	0.010	0.030	0.040	-1.000	0.050	
8009	13286	4.720	0.200	0.500	52.970	0.930	41.280	0.030	0.040	0.010	0.030	0.040	-1.000	0.050
8010	19146	3.990	0.180	0.490	52.330	0.570	41.070	0.030	0.040	0.010	0.030	0.040	-1.000	0.050
8011	25053	4.280	0.170	0.560	52.660	0.600	41.550	0.030	0.040	0.010	0.030	0.040	-1.000	0.050
8012	29817	4.870	0.520	0.890	51.690	0.760	41.050	0.040	0.050	0.020	0.040	0.050	-1.000	0.090
8013	33241	5.840	0.540	0.990	51.030	0.790	40.600	0.040	0.050	0.020	0.040	0.050	-1.000	0.090
8014	36444	7.340	0.420	0.760	50.270	0.760	39.940	0.040	0.050	0.020	0.040	0.050	-1.000	0.080
8015	38352	6.910	0.200	0.790	50.900	0.700	40.300	0.040	0.050	0.020	0.040	0.050	-1.000	0.080
8016	38820	7.400	0.670	1.070	50.040	0.820	39.780	0.050	0.060	0.020	0.050	0.060	-1.000	0.140
8017	40371	6.890	0.570	0.950	50.510	0.800	40.080	0.050	0.060	0.020	0.050	0.060	-1.000	0.120
8018	43096	6.440	0.750	1.090	51.130	0.860	40.450	0.040	0.050	0.020	0.040	0.050	-1.000	0.070
8019	44079	8.090	0.590	1.090	49.590	0.870	39.430	0.050	0.060	0.020	0.050	0.060	-1.000	0.140
8020	43682	7.460	0.580	0.940	50.100	0.870	40.650	0.050	0.060	0.020	0.050	0.060	-1.000	0.120
8021	44273	6.280	0.300	0.660	51.220	0.800	40.800	0.050	0.060	0.020	0.050	0.060	-1.000	0.110
8022	45984	8.630	0.680	1.110	49.270	0.880	40.650	0.080	0.090	0.030	0.080	0.090	-1.000	0.130
8023	45441	8.920	0.600	1.110	48.910	0.860	40.250	0.050	0.060	0.020	0.050	0.060	-1.000	0.110
8024	45258	7.160	0.780	0.910	50.690	0.780	40.250	0.030	0.040	0.010	0.030	0.040	-1.000	0.050
8025	43133	8.640	0.900	1.270	48.940	0.950	39.130	0.050	0.060	0.020	0.050	0.060	-1.000	0.160
8026	43108	7.820	0.900	1.170	49.440	0.980	39.560	0.050	0.060	0.020	0.050	0.060	-1.000	0.160
8027	43405	6.290	0.560	0.840	48.700	0.910	40.520	0.030	0.040	0.010	0.030	0.040	-1.000	0.100
8028	42479	8.170	1.140	1.320	48.910	1.150	39.310	0.070	0.080	0.030	0.070	0.080	-1.000	0.160
8029	43482	7.970	1.090	1.260	48.910	1.150	39.420	0.070	0.080	0.030	0.070	0.080	-1.000	0.160
8030	45948	9.490	1.040	1.340	47.990	1.120	38.720	0.070	0.080	0.030	0.070	0.080	-1.000	0.170
8031	45389	8.830	0.670	1.070	48.830	1.060	39.300	0.060	0.070	0.020	0.060	0.070	-1.000	0.100
8032	45201	7.680	0.460	0.760	49.830	1.100	39.980	0.060	0.070	0.020	0.060	0.070	-1.000	0.080
8033	43536	8.600	1.030	1.220	48.530	1.110	39.170	0.060	0.070	0.020	0.060	0.070	-1.000	0.190
8034	42614	9.810	1.160	1.390	47.570	1.170	38.470	0.070	0.080	0.030	0.070	0.080	-1.000	0.210
8035	38850	10.560	0.880	1.350	47.390	1.410	38.190	0.080	0.090	0.030	0.080	0.090	-1.000	0.130
8036	35490	14.110	1.580	2.030	44.370	1.580	35.980	0.110	0.120	0.040	0.110	0.120	-1.000	0.180
8037	32004	15.500	1.580	2.030	43.320	1.580	35.310	0.110	0.120	0.040	0.110	0.120	-1.000	0.180
8038	27570	17.050	1.580	2.030	43.070	1.580	35.020	0.110	0.120	0.040	0.110	0.120	-1.000	0.180
8039	22338	23.880	1.580	2.030	43.070	1.580	35.020	0.110	0.120	0.040	0.110	0.120	-1.000	0.180
8040	24.470	1.580	1.890	2.420	43.070	1.580	35.020	0.110	0.120	0.040	0.110	0.120	-1.000	0.240

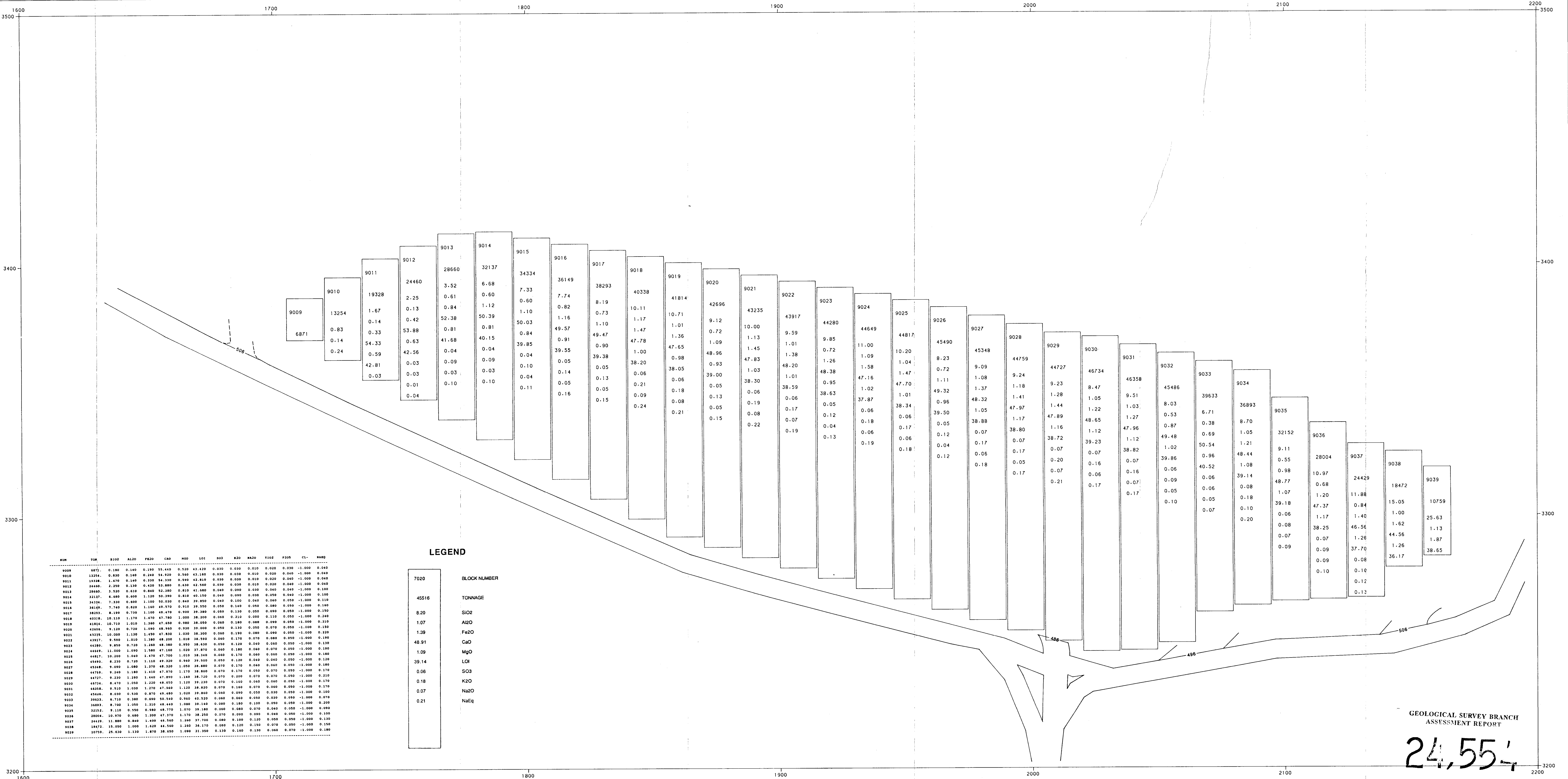
LEGEND

7020	BLOCK NUMBER
45516	TONNAGE
8.20	SIQ2
1.07	AI2O
1.39	Fe2O
48.91	CaO
1.09	MgO
39.14	LOI
0.06	SO3
0.18	K2O
0.07	Na2O
0.21	NaEq

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

24,554

Drawn by A-BEAUDET	Date 10/25/93	Revised by	Date
DWC NO. 11422-1993-14		KAMLOOPS QUARRY BC. 1993	
SCALE 1 : 500			
Lafarge Canada Inc. Corporate Technical Services		LIMESTONE QUARRY BENCH 496 level 8	
FROM 496.00		TO 506.00	



NUM	TOM	SiO2	Al2O3	Fe2O3	CaO	MgO	LOI	Na2O	K2O	Na2O	SiO2	Fe2O3	CL-	MARK
9009	6871	0.14	0.33	0.59	42.81	0.03	0.03	0.01	0.04					
9010	13254	0.83	0.24											
9011	19328	1.67	0.14	0.33	54.33	0.59	0.03	0.03	0.03					
9012	24460	2.25	0.13	0.42	53.88	0.81	0.04	0.01	0.04					
9013	28660	3.52	0.61	0.84	52.38	0.81	0.04	0.10						
9014	32137	6.68	1.12	1.12	50.39	0.81	0.04	0.10						
9015	34334	7.33	0.60	1.10	50.03	0.84	0.04	0.11						
9016	36149	7.74	0.82	1.16	49.57	0.91	0.05	0.16						
9017	38293	8.19	0.73	1.10	49.47	0.90	0.05	0.15						
9018	40338	10.11	1.17	1.47	47.78	1.00	0.06	0.24						
9019	41814	10.71	1.01	1.36	47.65	0.98	0.06	0.21						
9020	42696	9.12	0.72	1.09	48.96	0.93	0.05	0.15						
9021	43235	10.00	1.13	1.45	47.83	1.03	0.06	0.08						
9022	43917	9.59	1.01	1.38	48.20	1.01	0.06	0.17						
9023	44280	9.85	0.72	1.09	48.38	0.95	0.05	0.13						
9024	44649	11.00	1.04	1.58	47.16	1.07	0.06	0.19						
9025	44817	10.20	1.04	1.47	47.70	1.01	0.06	0.18						
9026	45490	8.23	0.72	1.04	49.32	1.05	0.05	0.12						
9027	45348	9.09	1.08	1.37	48.32	1.05	0.07	0.17						
9028	44759	9.24	1.18	1.41	47.97	1.17	0.05	0.17						
9029	44727	9.23	1.28	1.44	48.65	1.12	0.07	0.21						
9030	46734	8.47	1.05	1.22	48.22	1.12	0.07	0.17						
9031	46358	9.51	1.03	1.27	47.96	1.12	0.07	0.17						
9032	45486	8.03	0.53	0.98	49.48	1.02	0.06	0.10						
9033	39633	6.71	0.38	0.69	50.54	0.96	0.06	0.07						
9034	36893	8.70	1.05	1.21	48.44	1.08	0.06	0.20						
9035	32152	9.11	0.55	0.98	48.77	1.07	0.06	0.09						
9036	28004	10.97	0.68	1.20	47.37	1.17	0.07	0.10						
9037	24429	11.88	1.20	1.40	46.56	1.17	0.07	0.10						
9038	18472	15.05	0.84	1.62	44.56	1.26	0.09	0.12						
9039	10759	15.05	1.00	1.87	44.56	1.26	0.09	0.12						

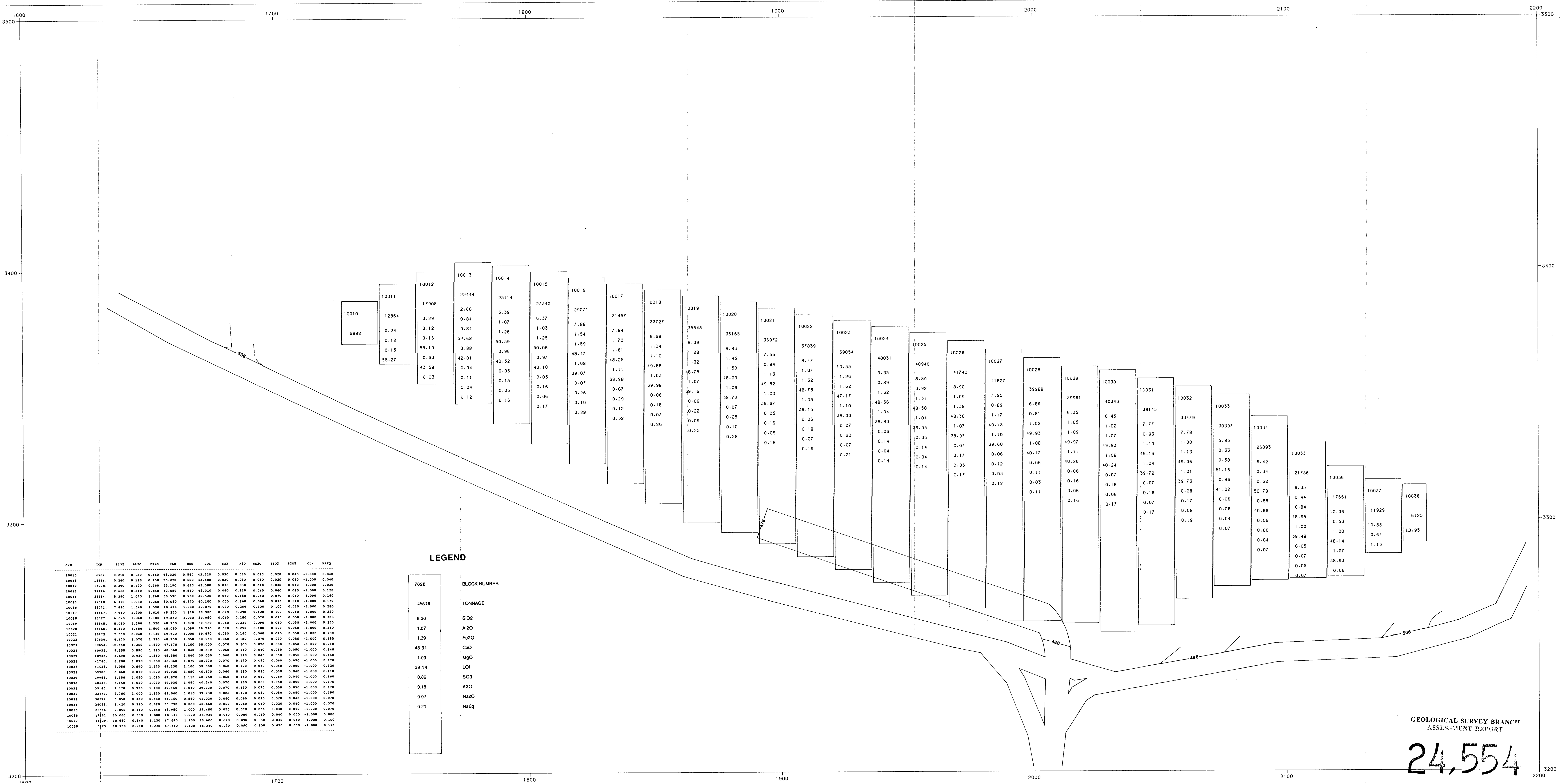
LEGEND

7020	BLOCK NUMBER
45516	TONNAGE
8.20	SiO2
1.07	Al2O3
1.39	Fe2O3
48.91	CaO
1.09	MgO
39.14	LOI
0.06	SO3
0.18	K2O
0.07	Na2O
0.21	NaEq

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

24,554

Drawn by A-BEAUDET	Date 10/26/93	Revised by	Date
DWG NO. 11422-1993-15			
SCALE 1 : 500			
10 5 0 10 20 30 40 50 meters			
Lafarge Canada Inc. Corporate Technical Services			
KAMLOOPS QUARRY BC. 1993			
LIMESTONE QUARRY BENCH 486 level 9			
FROM 486.00 TO 496.00			



BLOCK NUMBER	TONNAGE
7020	
45516	
8.20	
1.07	
1.39	
48.91	
1.09	
39.14	
0.06	
0.18	
0.07	
0.21	

LEGEND

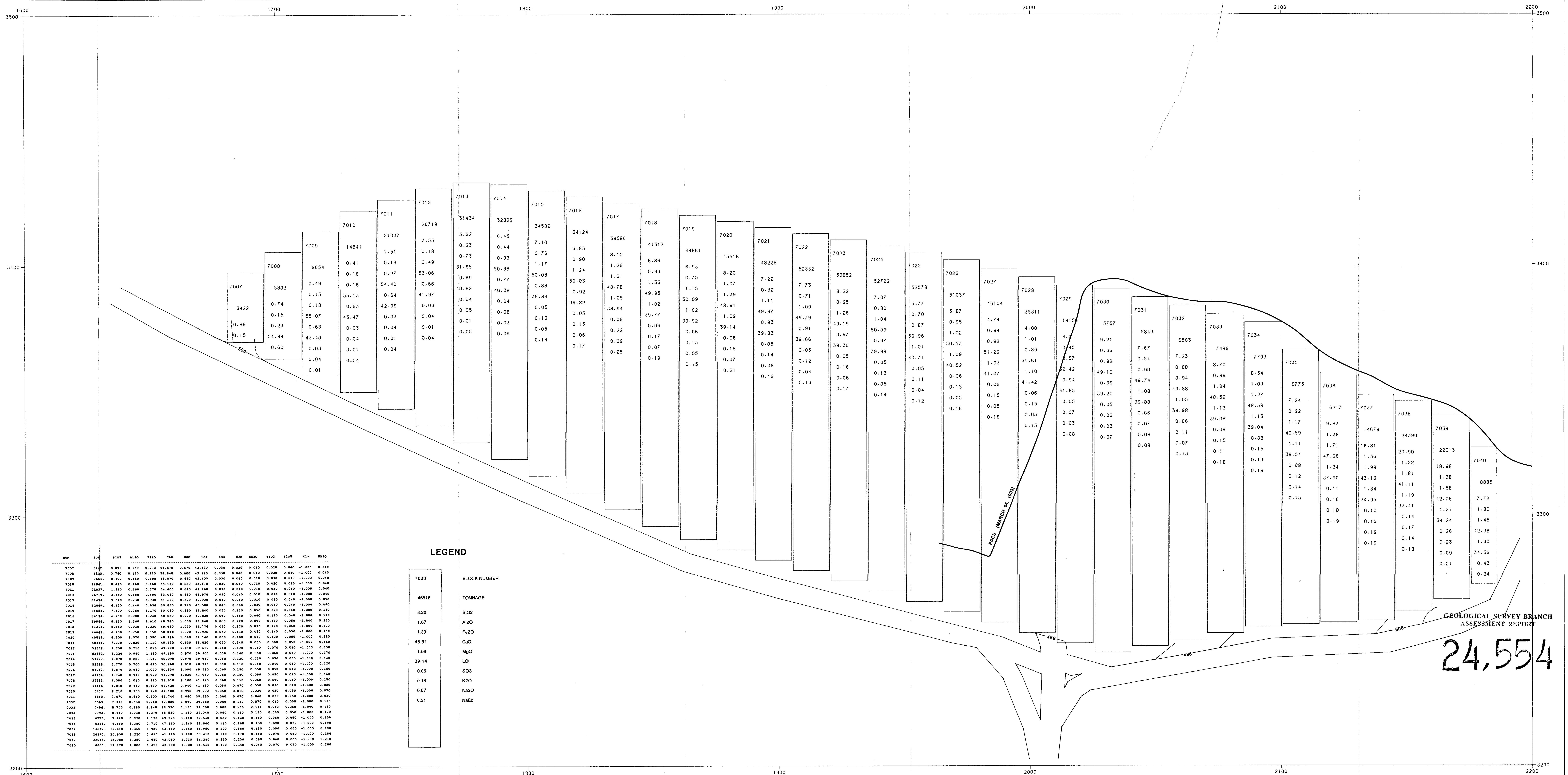
- BLOCK NUMBER
- TONNAGE
- SiO2
- Al2O3
- Fe2O3
- CaO
- MgO
- LOI
- K2O
- SO3
- K2O
- Na2O
- NaEq

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

24,554

Drawn by A-BEAUDET	Date 10/26/93	Revised by	Date
DWG NO. 11422-1993-16		Lafarge Canada Inc. Corporate Technical Services	
SCALE 1 : 500		KAMLOOPS QUARRY BC. 1993	
10 5 0 10 20 30 40 50 meters		LIMESTONE QUARRY BENCH 476 level 10	
		FROM 476.00 TO 486.00	

M17



NUM	TON	SiO2	Al2O3	Fe2O3	CaO	MgO	LOI	SO3	K2O	Na2O	Y2O3	P2O5	CL	HAZD
7007	3422	0.89	0.15	0.23	14.870	0.570	43.170	0.030	0.010	0.020	0.040	-1.000	0.040	
7008	5803	0.74	0.15	0.23	14.940	0.600	43.220	0.030	0.040	0.010	0.020	0.040	-1.000	0.040
7009	9654	0.49	0.16	0.27	14.841	0.41	55.130	0.030	0.040	0.010	0.020	0.040	-1.000	0.040
7010	21037	1.51	0.16	0.27	14.841	0.41	55.130	0.030	0.040	0.010	0.020	0.040	-1.000	0.040
7011	26719	3.55	0.18	0.18	51.65	0.69	50.88	0.77	0.88	0.92	0.05	0.01	0.05	0.05
7012	31434	5.62	0.23	0.44	6.45	0.44	7.10	6.93	8.15	6.86	6.93	8.15	6.86	6.93
7013	32899	6.45	0.44	0.93	0.76	0.90	1.17	1.24	1.26	1.26	1.26	1.26	1.26	1.26
7014	34582	7.10	0.76	0.90	1.17	1.24	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26
7015	34124	6.93	0.90	1.17	1.24	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26
7016	39586	8.15	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26
7017	41312	6.86	0.93	0.75	6.93	0.75	8.20	8.22	8.22	8.22	8.22	8.22	8.22	8.22
7018	44661	6.86	0.93	0.75	6.93	0.75	8.20	8.22	8.22	8.22	8.22	8.22	8.22	8.22
7019	45516	8.20	1.07	1.09	1.07	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
7020	48228	7.22	0.82	0.71	7.22	0.82	7.73	7.73	7.73	7.73	7.73	7.73	7.73	7.73
7021	52352	7.73	0.71	0.91	7.73	0.71	8.22	8.22	8.22	8.22	8.22	8.22	8.22	8.22
7022	53852	8.22	0.91	0.97	8.22	0.91	8.22	8.22	8.22	8.22	8.22	8.22	8.22	8.22
7023	52729	7.07	0.80	0.87	7.07	0.80	7.07	7.07	7.07	7.07	7.07	7.07	7.07	7.07
7024	52578	5.77	0.70	0.87	5.77	0.70	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.77
7025	51057	5.77	0.87	0.92	5.77	0.87	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.77
7026	46104	4.74	0.94	0.92	4.74	0.94	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74
7027	35311	4.00	1.01	1.01	4.00	1.01	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
7028	14155	4.74	0.94	0.92	4.74	0.94	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74
7029	5757	9.21	0.36	0.92	9.21	0.36	9.21	9.21	9.21	9.21	9.21	9.21	9.21	9.21
7030	5843	7.67	0.54	0.90	7.67	0.54	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67
7031	6563	7.23	0.68	0.94	7.23	0.68	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23
7032	7486	8.70	0.99	1.24	8.70	0.99	8.70	8.70	8.70	8.70	8.70	8.70	8.70	8.70
7033	7793	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03
7034	854	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27
7035	6775	7.24	0.92	1.17	7.24	0.92	7.24	7.24	7.24	7.24	7.24	7.24	7.24	7.24
7036	6213	9.83	1.38	1.71	9.83	1.38	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83
7037	14679	16.81	20.90	22013	16.81	20.90	22013	16.81	20.90	22013	16.81	20.90	22013	16.81
7038	24390	1.36	1.98	1.81	1.36	1.98	1.81	1.36	1.98	1.81	1.36	1.98	1.81	1.36
7039	22013	18.98	1.38	1.58	18.98	1.38	1.58	18.98	1.38	1.58	18.98	1.38	1.58	18.98
7040	8885	17.72	1.30	1.45	17.72	1.30	1.45	17.72	1.30	1.45	17.72	1.30	1.45	17.72

LEGEND

7020	BLOCK NUMBER
45516	TONNAGE
8.20	SiO2
1.07	Al2O3
1.39	Fe2O3
48.91	CaO
1.09	MgO
39.14	LOI
0.06	SO3
0.18	K2O
0.07	Na2O
0.21	NaEq

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

24,554

	Drawn by	Date	Revised by	Date	
	A-BEAUDET	10/25/93			
DWG NO. 11422-1993-13					KAMLOOPS QUARRY BC. 1993
SCALE 1 : 500					LIMESTONE QUARRY
					BENCH 506 level 7
FROM 506.00 TO 520.00					MIB