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September 5, 1985

EXECUTIVE SUMMARY

Subject: SECO PRODUCTS Facility - Washinton, MO

Purpose: Within the constraints of limited data and time, determine the environmental liability/risk exposure associated with the acquisition of subject properties.

Premise: This Environmental Response Assessment(ERA) was conducted, not to determine whether or not clean-up would be required, but rather, to affix an estimated cost to inevitable remediation.

Total Estimated Cost For Cleanup:	$3,499,200
1) Cost before 20% Contingency:	$2,916,400
2) Itemization of Specific Tasks/Areas	
a) Lagoon Closure	$400,000
b) Site Assessment	$160,000
c) Disposal of Other Areas	$570,000
d) Labor in those Areas	$200,000
e) Groundwater Treatment	$1,500,000
f) Analyses of Other Areas	$8,000
g) Verification/Other Areas	$40,000
h) Certify Analyses Cost	$38,400
Total Estimated Cost	$2,916,000

R00349054
RCRA RECORDS CENTER

CONCERNS

1) SECO PRODUCTS, did not report, nor do its files indicate that the required CERCLA(Superfund) Notification was made to the Federal EPA that they were maintaining an unlicensed dumpsite on its property, (Deadline: June 1981) which could precipitate enforcement action and prohibit transfer of ownership because of outstanding violations and/or unresolved environmental issues.(Reference: Section 260.465 of the Missouri Hazardous Waste Management Law, 1983.)

EXHIBIT V

CONCERNS Cont'd

2) Some inconsistencies exist with data and copies of correspondence supplied Hussmann Corporation by SECO(or information withheld?)e.g. from a visit with the MO DEQ, their file, when made available to us, indicated that an earlier cost estimate for lagoon clean-up/closure was $300,000 - $400,000 or 6x to 7x as great as the cost supplied to to the MO DEQ and eventually Hussmann Corporation. And this cost of about $400,000 is more in line with our estimate for the same work.

3) The MO DEQ appears to be either inconsistent or less restrictive in its enforcement of hazardous waste regulations and/or the discharge of regulated priority pollutants. As an example, the MO DEQ has not pursued the known, excessive levels of TCE in the shallow aquifer at SECO. On the other hand, the MO DEQ is concerned about TCE levels of 2.7 ppb or greater in drinking water supplies, but only if that water supply is "a public drinking water entity" because it has no enforcement authority over a well as is in operation at SECO. Nevertheless, the production (deep) well is also the plant's drinking water supply. The prudent businessman would consider the long-term exposure of his employees and the threat of future personal liability suits.

4) The March 1985 internal MO DEQ memo for more "information regarding potential releases...." is ominous and may be the precursor of impending enforcement action.

5) Although it is a foregone conclusion (and safe bet) that clean-up of at least the shallow aquifer will be required, the level to which one must clean, e.g. zero, undetected or 1 ppb, opens the cost variances to orders of magnitude, such $500,000 vs $5,000,000.

Unfortunately, the cost of groundwater clean-up will invariably be the largest cost to bear. Only with an on-site physiochemical assessment can the overall clean-up be predicted with any degree of certainty.

Again, we feel confident that the $3,499,200 figure is realistic, not overly conservative for it accounts for virtually all potential as well as real costs.

F. G. TROPPE, P.E.

9/5/85

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EXHIBIT A

There are a number of known, relevant facts that should serve as background for this Environmental Response Assessment(ERA), such as

Under the US-EPA Superfund Law, firms that have disposed of hazardous wastes on their own property were to have completed a CERCLA Declaration (as of June 1981), or where it is to be an ongoing activity, those firms involved in such activities were to have applied for interim status under RCRA (as of November 1980).

Any CERCLA site must be disclosed in the deed of sale before the property is sold or ownership transferred.

Even though both parties understand the terms, conditions and involvements of past environmental activities, if a problem were to surface and either of the parties were unable to respond financially, the other or viable remaining party now "solely owns the problem."

It remains virtually impossible to determine the cost of remedial work to effect groundwater clean-up, i.e. in this case the shallow aquifer, unless the plume's migration in both the vertical and horizontal directions can be measured, as well as the aquifer's properties of storage coefficient, transmissivity et al and a required goal or level of clean-up.

In the Missouri DNR letter of May 9, 1985 noted the inadequacies of SECO's groundwater assessment to address the extent of all contaminant plumes in both the vertical and horizontal directions. Envirodyne's Water Assessment Plan of September 26, 1984 for SECO will address most of these issues if and when it is ever implemented. SECO has not really responded.

TCE groundwater levels as high as 3500 ug/l have been measured. Ordinarily it would be certain that groundwater treatment would be required; this has not been reinforced by MO DNR personnel.

Assuming that groundwater treatment is inevitable, and should extraction wells with air stripping and/or carbon adsorption be required, clean-up costs in excess of $1.5MM can be reasonably expected, based on our experience with these type systems.

The most important, and often the most difficult, task is to establish a mutually-agreed upon level of clean-up for both soil and groundwater. Unfortunately, it has been known to happen that a project may get started and targeted for a specified level of clean-up and new health-effects data may tighten the clean-up criteria.

For this case, clean-up of the shallow aquifer need be to a level low enough, such as TCE $<$ 1 ppb, to enable the deep(production) well will eventually purge itself to a safe level well below TCE $\ll$ 0.5 ppb.

Although the TCE is the obvious main concern, the acidic nature of other on-site wastes, heavy metals, e.g. Chromium, Nickel, Copper, could manifest as another subsequent and significant concern.

EXHIBIT A

An acidic environment can, in time, destroy the soils, i.e. clays, bonding abilities and the metals will become more mobile through soil matrices.

Without soils data for this SECO Facility, it is virtually impossible to assess the potential problems associated with spill areas and other areas used for disposal.

As is often the case, the regulatory agencies will set the action levels or clean-up criteria using many and varied sources, such as federal or state standards, guidelines, water quality criteria or policy only. If standards are non-existent for a specific contaminant, as is often the case, the agency will develop an action level based on site-specific factors.[1] "In setting clean-up criteria, it is important to consider what is to be protected. Is the objective to avoid adverse human health effects, or to protect aquatic life? Different goals will result in different actions, levels and will require different types of remedial action."

The US-EPA has proposed recommended maximum contaminant levels(RMCLs) for a group of nine(9) chemical compounds that might cause health problems if found in drinking water supplies at significant levels. Trichloroethylene (TCE) is one of these since TCE has shown to produce tumors in mice but not rats whose metabolism of this compound is more similar to that of humans than that of mice. In spite of this, a zero(0) ug/l RMCL is being proposed by US-EPA for TCE which corresponds to a zero health risk. However, since they recognize that a zero level is not achievable, "recommended" levels must be set at a point which involves absolutely no health risk. The RMCLs are thus nonenforceable goals that are established under the Safe Drinking Water Act(SDWA) as a first step in setting maximum contaminant levels(MCLs).

"Enforceable standards (MCLs) would have to be higher than zero, but as close to the recommended contaminant level as feasible, based on health considerations, treatment technologies, cost and other factors."[2]

While the US-EPA has not developed an MCL for TCE, the Office of Drinking Water has developed a different set of criteria called suggested no adverse response levels(SNARLs) to protect human health from contaminated drinking water. The long-term SNARL for TCE has been set at 75 ug/l(ppb) and like the other SNARLs, are non-enforceable advisory levels that have been used as a suggested clean-up criteria by some states until the final MCLs are promulgated. The SNARLs do not take carcinogenicity into account and are mainly directed at the toxic effects of a given chemical.

TCE has been shown to be a central nervous system depressant. Persons exposed to high levels of TCE become sleepy, experience headaches and may develop liver or kidney damage.[3]

The US-EPA has set a criterion of 2.7 ug/l(ppb) for TCE based upon a cancer risk factor of 10^{-6} and some states, such as California, are using this figure as an action level for TCE. This criterion may prove to be the MCL eventually promulgated for TCE.

EXHIBIT A

The only potable well in the area is the SECO Plant's own process well that is testing 3.52 - 20.0 ug/l TCE. A somewhat subjective conclusion can be drawn that a potential liability exist for SECO even though such levels are not uncommon in many cities' water supplies where surface waters are being used as a source of drinking water.[5] During this cited reference, TCE levels in raw waters varied from 0.2 - 125 ug/l to 0.11 - 53 ug/l in finished waters, i.e. treated, with a mean value of 29.72 ug/l and 6.76 ug/l for these waters. Thirty-nine(39) cities' water supplies were involved in this study.

REFERENCES/BIBLIOGRAPHY

[1] Health & Environmental Aspects of Setting Clean-up Criteria by R. M. Block, J. Dragun & T. W. Kalinowski, Chem. Eng Reprint, Nov. 26, 1984

[2] EPA Environmental News, release of Monday, June 4, 1984; Truman Temple, (202) 382-5590

[3] US-EPA Region V Publication, Toxic Chemicals What They Are, How They Affect You.

[4] US-EPA National Primary Drinking Water Regulations, Volatile Synthetic Organic Chemicals Proposed Rulemaking, Federal Register, Volume 49, June 12, 1984.

[5] US-EPA Office of Drinking Water, "The Occurrence of Volatile Organics in Drinking Water," Briefing Paper, March 6, 1980

EXHIBIT B

Future site assessment work will be required in order for more definitive costs to be developed both for the soils and groundwater at the SECO site.

This work will include the installation of additional groudwater monitoring wells, shallow soil probes Exploratory Borings, some geophysical surface work and possibly surface water/sediment analyses.

Soil gas samples/analyses is a strongly-recommended technique which has been most useful in defining TCE contamination/problem especially where TCE has been known to be released. Soil gas analyses is a very effective means of gathering large amounts of data & defining both soil and groundwater contamination. Because of the heterogeneous nature of soils, soil gas samples/analyses will have its limitations, but this technique may help to determine local hot spots, and in some areas, the extent of plume migration, i.e. some qualitative, but less quantitative.

Clearly, more extensive aquifer data will need to be gathered through the installation of pumps/wells to define the effectiveness of a groundwater extraction system, i.e. cone of influence, aquifer connections etc. The simple slug testing done on the small monitoring wells will not give sufficient data to design an effective groundwater treatment system.

A $160,000 cost estimate is being set for the future site assessment work which includes the cost of samples/analyses. This cost does not include the aquifer test data necessary to design a cost effective groundwater treatment system. These latter costs have been included in the estimated $1.5MM potential groundwater treatment system .

It should be emphasized that treatment cost estimates are directly a function of plume migration and aquifer characteristics. The volume of water requiring treatment, i.e. hydraulics, will probably prove to be the monitoring criteria, as opposed to contaminant concentrations in sizing the treatment system.

Any treatment system designed to effectively contain one or more plumes will involve multiple extraction wells since TCE contamination is widely spread across the plant property, i.e. an estimated 600 feet. It is conceivable that 12 - 15 extraction wells may need to be installed along the western boundary of the property to contain off-site TCE migration. Substantial volumes of water including unwanted recharge water from DuBois Creek may need to be treated to abate this problem. Typically, sand and gravel aquifers transmit high volumes of water.

Probably the most disturbing data generated thus far from the SECO wells is the TCE concentration in the deeper process well on-site. This suggests that there certainly is a hydraulic link or pathway(leak) of contamination migration to the lower aquifer. The Production Well itself may be one such link if it is screened in both the Jefferson City and Roubidoux formations(?).

EXHIBIT C

Site #1

The earlier solids data taken in the area of the old acid dump site were taken at fairly shallow depths. With the age of this dump(1960), it would be appropriate if deeper soil borings were taken to confirm the absence of E.P. Toxicity Metals and possible organic contamination.

If additional analyses indicate that metals are not leaching, the issue remains whether or not the waste as originally disposed should have been classified as a corrosive waste by current RCRA criteria, i.e. D002, and therefore be subject to a CERCLA Declaration.

There still seems to be a certain amount of confusion surrounding the SECO response of the 7/16/85 inquiry(refer Envirodyne Supplement "B" of SECO's Closure Plan): Is this area's top 4" of soil contaminated with TCE, have low pH and heavy metals??? It may just be a moot point at this time and not of any grave consequence that it cannot await an in-depth site assessment at a later date.

Assuming that 4,444 cubic yards of soil will be removed from the area(based upon a 300' x 200' x 2' excavation) and disposed of in a secure chemical landfill as a hazardous waste, the disposal and backfill costs for this area alone could be in excess of $500,000.

Removal of Contaminated Soils

There is no accurate means of estimating the potential costs associated with the removal/disposal and backfilling of contaminated soil areas on the SECO site without the additional site assessment work.

Using the same bases as Hussmann's volumes of soil estimates, we will merely adjust our cost estimates where appropriate to refine their earlier estimates. As a conservative attempt, four(4) additional areas will be removed because of their "barren" appearance and suspected soil contamination. Three(3) of these areas, each measuring approximately 15' x 20' x 1' or 33 cubic yards, and an area near the north side of the building where soil contamination and possible foundation damage has occurred(size and extent of damage not known). These two(2) areas are identified as Area No.6 & Area No.7, respectively.

During the removal of contaminated soil, there are certain fixed costs, such as mobilization & demobilization of equipment, personnel protection, equipment de-contamination and necessary supervision costs. Excluding the lagoon job, these other costs may be on the order of $15,000.

The lagoon work is covered later in Exhibit D since the method of sediment handling and possible disposal may differ significantly from other soil work required.

EXHIBIT C

Removal of Contaminated Soils Cont'd

Using a disposal cost figure of $100/cu. yd. and a $12/cu. yd. backfill cost, the following costs can be estimated for these areas:

Area No. 2		
4440 cu. yd. x $112/cu. yd.	=	$500,000
Area No. 3		
178 cu. yd. x $112/cu. yd.	=	$ 20,000
Area No. 4		
178 cu. yd. x $112/cu. yd.	=	$ 20,000
Area No. 5		
231 cu. yd. x $112/cu.yd.	=	$ 26,000
Area No. 6		
33 cu. yd. x $112/cu. yd.	=	$ 4,000
Total		$570,000

Area No. 7 (these costs cannot be estimated @ this time)

In addition to the $8000 for testing for disposal(analytical costs), there are other analytical costs associated with the verification work and certification of proper closure costs. Our estimate concurs with the $40,000 previously estimated by Hussmann.

Continuing groundwater monitoring costs for the operation of a treatment system @ $38,400/yr. is reasonable and acceptable; this amount will be in addition to the $160,000 estimated for site assessment costs in Exhibit B.

Assume $20.00/cu. yd. for labor/backfilling and add the following total:

2 x 5060 cu. yd.(Areas 2 - 6) x $20/cu. yd. = $200,000

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EXHIBIT D

Critique of the Lagoon Closure Plan

It is not unlikely that the MO DNR will require SECO to treat its sludges in and from the lagoon as RCRA-regulated hazardous wastes. The treatment of metal sludges via some chemical precipitation or chemical fixation method will dramatically add to the treatment/disposal costs. (The treatment cost and disposal locally as a non-hazardous waste after treatment might be a trade-off with the disposal cost of a hazardous waste w/o treatment and into a TSD Facility out-of-state.)

Using the 298 cu. yd. of sludge/soil to be removed, these cost might be:

298 cu. yd. x $200/cu. yd. (fixation)	=	$ 60,000
600 cu. yd. x $ 35/cu. yd. (disposal)	=	$ 21,000
7155 cu. yd. x $ 12/cu. yd (fill)	=	$ 86,000
7755 cu. yd. x $ 20/cu. yd (excavate/fill)	=	$155,000
Total		$322,000

Consultant certification costs of $10,000 is appropriate with an additional expense/cost of $60,000 for project management and field supervision.

The total lagoon closure cost could therefore approach $400,000

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Total Project Costs Itemized : $3,499,200 (includes 20% contingency)

Lagoon Closure	$400,000
Site Assessment	$160,000
Disposal of Other Areas	$570,000
Labor in Those Areas	$200,000
Groundwater Treatment	$1,500,000
Analyses of Other Areas	$8,000
Verification/Other Areas	$40,000
Certify Analyses Cost	$38,400

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September 5, 1985

MR. ROBERT L. MILLER, Manager
Hazardous Materials & Environmental Protection
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12999 St. Charles Rock Road
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Dear Mr. Miller:

This Environmental Response Assessment(ERA) of the SECO PRODUCTS Facility in Washington, MO, will follow two(2) separate, yet complementary, treks in order to develop an inevitable clean-up strategy and to affix to it, the associated, yet qualified clean-up/remediation costs.

Our report will also be presented in two(2) parts, i.e. an Executive Summary and the unabridged form to corroborate the individual and collective concepts and their respective estimated costs.

We feel confident that we have scrutinized each issue and potential concern with, at least, as much effort and experience as any agency personnel would. Notwithstanding, even where the Agency may elect to take a softened or less restrictive position, we choose to allow only a reasonable risk exposure to persist for the longer term. Our judgement (& cost estimate) is based upon prior groundwater clean-up experience and the direction/sentiment that we expect from legislators and regulators.

We trust that this, our evaluation, will provide Hussmann Management with a defensible clean-up cost of the properties in question. We look forward to assisting you further in this matter as the needs arise.

Very truly yours,

Fred G. Troppe

Fred G. Troppe

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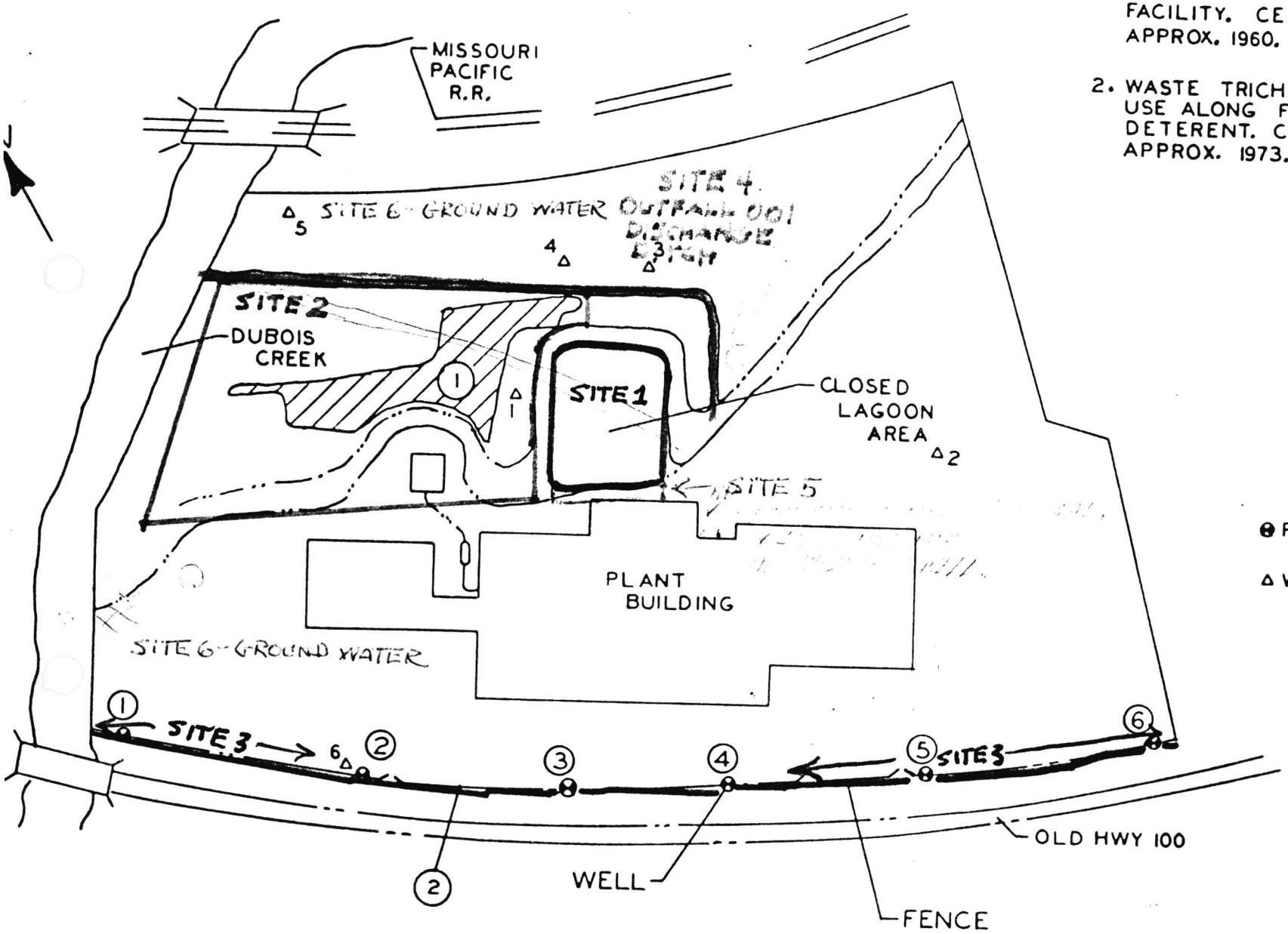
Enclosure

1. DISCHARGE FROM ELECTROPOLISHING FACILITY. CEASED ACTIVITY APPROX. 1960.

2. WASTE TRICHLOROETHYLENE USE ALONG FENCE AS WEED DETERENT. CEASED ACTIVITY APPROX. 1973.



● PROPOSED SAMPLING POINTS

△ WATER WELLS

SITES NOT TO SCALE

SECO