

# **Really Fast Computers' Future Environmental Disposals: A Present Concern?**

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## **Abstract**

Really Fast Computers is a case dealing with asset retirement obligations. The company currently has an established disposal method for waste, but is expanding operations which will create more waste. The company has some options for how to dispose of this increased waste, and future technology advances may change future disposal options and requirements. Students must decide how to currently recognize these potential liabilities, prior to the decision of which exact disposal methods will be selected. However, production has already begun. Thus, students must use an expected value model in determining the potential liability. In addition, students are asked how IFRS would vary from US GAAP in presenting these liabilities. Students find the ambiguity in the case complex and the uncertainty of disposal methods challenging. Many students are opposed to the expected value method, but also realize that we as accountants cannot wait around until the circumstances become totally clear. Students enjoy the case and believe it expands the information presented in the textbook. That is, the case is an extension of the difficulty found in most textbooks. It requires students to make assumptions and estimates. The ambiguity present poses difficulty in establishing a definite liability amount, as is true in the real world for most situations.

## **Introduction**

Really Fast Computers (RFC) is a successful, privately held company operating in the technology sector<sup>1</sup> and selling their products around the world. They have modeled their business approach after other computer hardware

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<sup>1</sup> Really Fast Computers is not a real company. However, the transactions and events encountered by the company are transactions that many companies may encounter. Specifically, the case involves asset retirement obligations faced by companies in many industries, including oil and gas and utilities. Companies that are committed to costs with the disposal of property, plant and equipment and natural resources may have asset retirement obligations to recognize.

companies that markets and sells their products and services directly to customers. RFC designs, develops, manufactures, and supports a wide range of computer systems and services that can be customized to meet specific customer requirements. The customers of RFC include large corporations; small to mid-sized businesses; and government, healthcare, and education entities. The largest portion of its business, nevertheless, arises from individual customers. Unless a major customization is required, RFC prides itself in a 96% rate of same day shipment to its customers.

The two shareholders (and their immediate families) of RFC, Tom Sloane and Jerry Fields, direct the operations of the company. RFC does not pay any corporate income taxes, as a result of being organized as an S-corporation for tax purposes. Instead Tom and Jerry report their proportionate shares of RFC's income on their personal tax returns.<sup>2</sup>

The company has grown considerably, but has not yet reached its full potential. Tom and Jerry believe that RFC can become a very significant player in the world's direct computer systems sector in a few short years. To do so, however, significant capital investments and additional working capital reserves will be required. A public offering of stock seems to be a strategic approach to garnish to acquire this needed capital. In anticipation of an initial public offering, to reduce volatility from economic downturns, to enhance its financial position, and to provide a bright future for its long-time employees, RFC expanded its monitor cleaning process to other uses as a distinct line of business in the current fiscal year.

### **The Acid Washing System**

Several years ago, RFC installed an acid washing system to clean computer monitors prior to shipment. This system creates a crystal clean monitor at time of purchase and effectively protects the monitor from airborne pollens and dusts. In fact, the monitor is significantly less prone to fingerprints, a benefit especially enjoyed by parents of small children. This washing system has given RFC a competitive advantage in an increasingly competitive marketplace.

The acid wash mixture becomes sterile after two years, but given the small quantities required, the wash can be continually rejuvenated by adding 20% more virgin acid. This rejuvenation unfortunately adds to the volume of the mixture, creating capacity issues. Prior to the current fiscal year, 2017, excess mixture was disposed of bi-annually through the use of an outside disposal company. The disposal company charged per load fees, which were sufficient to cover its ultimate landfill closing costs. At the beginning of this fiscal year, 2017, all companies in the county were "encouraged" to contribute nonhazardous waste to a newly created county landfill. The ultimate goal of the landfill is to provide a significant parks and recreation site after ten years. Presently the site is a swampy, high water table land parcel. With the Department of Natural Resource's blessing, the county will deposit nonhazardous waste in the site prior to its conversion into a countywide sports complex housing a variety of four season sports. The county is charging a per load fee to contributors of waste, in addition to a proportionate share of closing costs for the site, rather than taxing the general public. It is anticipated that all companies in the county will participate, due to the establishment of significant fines for transporting nonhazardous waste across county lines. RFC estimates the annual per load charges will total \$1,000,000 and that their share of year ten site closing costs will approximate \$3,000,000.

### **The Expanded Line of Business**

The acid washing technique, during preliminary market tests, has proven effective in cleaning small engine parts. RFC has obtained contracts from several small engine manufacturers and began cleaning those parts on July 1, 2017. However, RFC has discovered that cleaning these engine parts severely strains the stability of the acid mixture.

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<sup>2</sup> A S Corporation is considered a flow-through entity. That is, although legally it is a corporation, it is not taxed on its income. Rather all of its income is apportioned to its shareholders (but not necessarily distributed) and reported on the shareholders' individual income tax returns.

Chemical analysis has revealed that the mixture's stability can be sustained for only 10 years, by adding 20% virgin acid annually. At the end 10 years using existing technology, the mixture will become too acidic and will require disposal. Unfortunately, the mixture's higher level of contaminants and acidity level would mandate disposal under the provisions of the Environmental Protection Agency's (EPA) hazardous waste disposal program. The mixture, thus, could not be brought to the county landfill, but rather the waste would require transport to a state hazardous waste disposal site.

With RFC's expansion of its cleaning process during the current fiscal year, its disposal and closing costs at the county landfill will be unaffected. However, the disposal of the entire mixture at the end of ten years at a state hazardous disposal site would cost RFC approximately \$10,000,000. RFC, however, is actively pursuing and testing a variety of stabilizing agents. RFC is hopeful this research can add sufficient stability to the mixture either to extend its life cycle to 20 years or indefinitely. RFC's production engineers promise a full report by the end of 2018, with implementation, if feasible, during 2019.

### **The Initial Public Offering of Stock**

RFC is attempting to maximize the value of its public stock offering (IPO). They are especially concerned with any present and potential liabilities associated with their acid washing system. Potential investors, according to IPO experts, discount stock prices if a company's total debt to total assets ratio exceeds 40 percent<sup>3</sup>, but view favorably companies attaining a return on assets (net income divided by total assets) exceeding four percent<sup>4</sup> and a current ratio in excess of 1.50<sup>5</sup>. They are concerned whether the disposal requirements for its acid washing mixture will impact these three financial measures.

RFC's financial statements presented in Exhibit 1 do not incorporate any liabilities related to its disposal requirements for its acid washing mixture as the end of the current fiscal year end, December 31, 2017. The financial statements are unaudited and have not been reviewed by anyone outside of RFC. In anticipation of the IPO, RFC plans to switch to one of the "Big Four" public accounting firms for its annual audit. RFC's expressed desire is for its financial statements to fairly reflect the results of its operations prior to the audit, providing a favorable impression of the company's accounting practices to the new audit firm.

### **Case Analysis Questions**

RFC has approached you, a partner in a regional CPA firm, for your opinion of how these disposal alternatives will impact its financial statements for the year ended December 31, 2017. They would like you to review their preliminary financial statements, consider the underlying transactions and events related to these disposal methods, and determine whether RFC's results maximize their potential in the initial public offering. That is, you are to assess how these disposal method alternatives will impact its financial statements. Thankfully, you can rest assured that the financial statements fairly state the financial position and results of operations as required under U.S GAAP, before considering any financial implications of the acid washing mixture. RFC, after the "Big Four" CPA firm's seal of approval, will use these financial statements as a component of its proxy and registration materials for its IPO. For simplicity, the required financial statement note disclosures have been omitted. Unless otherwise indicated, a 6% discount rate is considered reasonable for use by RFC when computing the present value of its obligations.

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<sup>3</sup> [www.investopedia.com](http://www.investopedia.com), New York, NY, indicates that lower debt ratios (40% or less) are considered better debt ratios.

<sup>4</sup> [www.investopedia.com](http://www.investopedia.com), New York, NY, believes that the ratios should be around 5%, but banks have a targeted rate of only 1.5%. We use a 4% rate here as it is within the range of rates seemingly acceptable by investors.

<sup>5</sup> [www.investopedia.com](http://www.investopedia.com), New York, NY, indicates that the current ratio should be at least 1.0. However, a current ratio of say 3.0 may indicate the company is not fully utilizing its current assets. We therefore used a more middle ground required current ratio requirement.

## Case Questions:

1. As of December 31, 2017:
  - a. Should RFC recognize a liability related to its disposal agreement with the county landfill for its biannual disposal costs of its acid washing mixture?
  - b. If yes, what amount should be recognized?
  - c. If no liability is recognizable at December 31, 2017, then when would a liability be established, and in what amount?
  - d. Prepare all necessary journal entries related to this potential asset retirement obligation for 2017.
  
2. As of December 31, 2017:
  - a. Should RFC recognize a liability related to its potential disposal of the entire acid washing mixture at the end of ten years at a state hazardous waste disposal site?
  - b. If yes, what amount should be recognized?
  - c. If no liability is recognizable at December 31, 2017, then when would a liability be established, and in what amount?
  - d. How does the upcoming report from RFC's production engineers about the extended life of the mixture impact your decision regarding a present obligation for future waste disposal?
  - e. Prepare all necessary journal entries related to this potential state hazardous waste disposal for 2017.
  
3. Suppose that prior to December 31, 2017, the production engineers indicated that the probabilities associated with this potential waste disposal were a 50% chance of a 10-year disposal, a 30% chance of a 20-year waste disposal, and a 20% chance for an indefinite life estimate. Would these estimates impact your determination of:
  - a. Whether or not a liability exists at December 31, 2017?
  - b. The amount of any liability that exists at December 31, 2017?
  - c. Prepare all necessary journal entries related to this potential asset retirement obligation for 2017, using the engineer's new estimates.
  
4. Based on the journal entries you prepared for parts 1 and 3 above and their impact on the financial statements of RFC, did RFC meet the criteria that, according to IPO experts, should attain prior to a successful IPO:
  - a. Total debt to total assets ratio of 40 percent or less?
  - b. Return on assets ratio exceeding four percent?
  - c. Current ratio in excess of 1.50?Why or why not?
  
5. If RFC adopted IFRS instead of US GAAP for external reporting, would their accounting for these potential asset retirement obligations be different? If yes, how would your answers vary?

**Exhibit 1****Internally Prepared Financial Statements: Really Fast Computers**

**Really Fast Computers**  
**Income Statement**  
**For the Year Ended December 31, 2017**

Revenue	
Desktop Computers	\$21,060,000
Laptop Computers	13,550,000
Services	18,000,000
Software	<u>6,535,000</u>
Total Revenue	59,145,000
Less: Sales Discounts Taken	<u>1,800,000</u>
Net Revenue	57,345,000
Cost of Revenue	<u>45,876,000</u>
Gross Margin	11,469,000
Operating Expenses	
Warranty Expense	2,195,000
Lease Expense	450,000
Salaries Expense	1,899,000
Pension Expense	700,000
Depreciation/Amortization Expense	2,655,000
Miscellaneous Expenses	<u>220,000</u>
Operating Income	3,350,000
Other Revenue and Expense	
Interest Revenue	300,000
Interest Expense	<u>650,000</u>
Net Income	<u>\$3,050,000</u>

**Exhibit 1 (continued)****Internally Prepared Financial Statements: Really Fast Computers**

**Really Fast Computers**  
**Balance Sheet**  
**December 31, 2017**

<u>Assets</u>	
Current Assets	
Cash and Cash Equivalents	\$ 6,500,000
Short-Term Investments	1,200,000
Net Receivables	5,450,000
Inventory	500,000
Other Current Assets	<u>2,050,000</u>
Total Current Assets	15,700,000
Long-Term Investments	3,100,000
Property, Plant and Equipment, net	47,000,000
Other Assets	<u>200,000</u>
Total Assets	<u><u>\$66,000,000</u></u>
<u>Liabilities and Stockholders' Equity</u>	
Current Liabilities	
Accounts Payable	\$ 3,800,000
Short-Term Debt	5,400,000
Unearned Revenue – Sales Warranties	<u>350,000</u>
Total Current Liabilities	9,550,000
Long-Term Liabilities	<u>8,040,000</u>
Total Liabilities	<u>17,590,000</u>
Stockholders' Equity	
Common Stock, \$10 par, 2,000,000	
Shares authorized, 1,400,000	
Shares issued and outstanding	14,000,000
Paid-in Capital-Common Stock	5,110,000
Retained Earnings	<u>29,300,000</u>
Total Stockholders' Equity	<u>48,410,000</u>
Total Liabilities and Stockholders' Equity	<u><u>\$66,000,000</u></u>

Exhibit 1 (continued)

**Internally Prepared Financial Statements: Really Fast Computers**

**Really Fast Computers  
Statement of Retained Earnings  
For the Year Ended December 31, 2017**

Retained Earnings, 1/1	\$27,650,000
Net Income	3,050,000
Cash Dividends Declared and Paid	<u>(1,400,000)</u>
Retained Earnings, 12/31	<u>\$29,300,000</u>

**Exhibit 1 (continued)****Internally Prepared Financial Statements: Really Fast Computers**

**Really Fast Computers**  
**Statement of Cash Flows**  
**For the Year Ended December 31, 2017**

Cash Flows From Operating Activities	
Net Income	\$ 3,050,000
Adjustments to Net Income	
Depreciation Expense	2,655,000
Decrease in Short-Term Investments	7,500,000
Decrease in Net Receivables	445,000
Decrease in Inventory	50,000
Decrease in Other Current Assets	150,000
Decrease in Accounts Payable	(450,000)
Increase in Short-Term Debt	200,000
Increase in Unearned Rev. – Sales Warranties	<u>350,000</u>
Cash Provided by Operating Activities	13,950,000
Cash Flows from Investing Activities	
Purchase of Equipment	(19,390,000)
Cash Flows from Financing Activities	
Proceeds from Notes Payable	4,000,000
Cash Dividends Paid	<u>(1,400,000)</u>
Decrease in Cash and Cash Equivalents	(2,840,000)
Cash and Cash Equivalents, 1/1	<u>9,340,000</u>
Cash and Cash Equivalents, 12/31	<u>\$ 6,500,000</u>

**Really Fast Computers' Future Environmental Disposals: A Present Concern?  
Instructor Teaching Notes**

The balance sheet approach to the determination of income has taken root in the United States, strengthened by the FASB's conceptual framework project. That approach puts emphasis on balance sheet valuations (to some extent) and changes in net assets to determine periodic income. All changes in net assets during the period are then categorized as investments by owners, distributions to owners, or comprehensive income. Comprehensive income is further divided into items includable in net income and other comprehensive income adjustments. In reality then, net income is determined by changes in the balance sheet during the period, and the accountant must determine the detail (particular revenue and expense amounts) comprising that net income amount. That is, the income statement is prepared from the "bottom up". Revenues and expenses are indirectly measured under this approach, and the matching concept seemingly is used only to determine the timing of expenses for the liabilities recognized. Confusion can arise by students, however, when some future commitments are recognized as liabilities in full currently (future product warranty costs and the present value of asset retirement obligations), while others are recognized as liabilities over future periods (interest expense on bonds payable).

This case presents potential liabilities related to future disposal of production waste. The thought process required should help students understand which liabilities are recorded currently, which have postponed recognition, which are discounted using present value techniques, and which are simply recorded at their total future value cash outflow regardless of when the actual payment may be made. The case can aid instructors in discussing the recognition of liabilities and illustrate to students how the profession continues to struggle with liability timing and amount recognition.

Prior to determining if a liability has been created, a clear understanding of the definition of a liability is essential. The Financial Accounting Standards Board, in Statement of Financial Accounting Concepts 6, defines a liability as "probable future sacrifice of economic benefits arising from present obligations of a particular entity to transfer assets or provide services to other entities in the future as a result of past transactions or events" (1985).<sup>6</sup> That definition implies that an entity: (a) is presently responsible for the future transfer of assets or providing of services at a determinable date; (b) has a duty or responsibility that obligates it, leaving it little or no discretion to avoid the future sacrifice; and (c) that the cause of this future economic sacrifice was triggered by some occurrence in the past: an obligating event.

Although helpful that definition can sometimes be difficult to operationalize. Accountants continue to struggle with distinguishing which event is obligating and thereby creates a liability. Moreover, once recognized should those liabilities be valued (a) at the total, undiscounted future sacrifices, (b) at the present value of the future sacrifices, or (c) at a portion of the total amount? Finally, the recognition of a liability also requires the recognition of an asset, an expense, or a reduction in revenue. Proper matching of expenses to revenue/time periods mandates that students are aware how costs are matched to either revenues, time periods, or to the current period only.

Many firms struggle with asset retirement obligations. Companies that have disposal activities may be subject to asset retirement obligations for land fill closing and potential contingent liabilities. Utilities and oil and gas companies have decommissioning costs which creates asset retirement obligations. Asset retirement obligations are both hard to determine and estimate. Accountants frequently struggle in the process of determining the cost of the future disposals of property, plant and equipment and natural resources (to determine the best estimate of future cash outflows) and applying a discount rate that has been adjusted to reflect the uncertainty or risk of those cash flows. This case requires students to experiment with these complex computations and uncertainties.

**Case Use and Implementation Guidance**

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<sup>6</sup> Conceptual Framework for Financial Accounting and Reporting: Elements of Financial Statements and Their Measurement," Stamford, Conn.: FASB, 1976.

The case can best be used in intermediate accounting courses. The case should be distributed after asset retirement obligations are introduced and discussed. In addition, the case is also useful in a graduate level financial reporting course as a review of liabilities and expense matching issues. The case is very well suited for group work and for group discussions. Individual completion of the case is also appropriate. The individual completion can be followed by a group discussion as well.

Students enjoy the give and take during group discussions and class elaborations. Differences of opinion help bring out the issues prevalent in the case.

### **Evidence of Classroom Efficacy**

The case was tested in two intermediate accounting and two advanced accounting courses during the fall 2015 and spring 2016 semesters at a four-year university. The case was completed individually, but students were encouraged to connect together if needed and deemed beneficial. Many students did connect into an informal group setting. After completion of the case, an informal classroom discussion occurred. Students understood the uncertainty in these calculations and the importance of proper accounting for both expenses and liabilities. The case facts were of interest to students, allowing them to more easily relate to the dilemmas and ambiguity encountered in accounting for asset retirement obligations.

Students were asked to complete the questionnaire provided in Appendix A. That questionnaire was administered after students handed in the completed case and had a class discussion. The results of the survey are presented in Appendix B. These results indicate that students believed the case:

- was useful.
- should be used as part of this course in the future.
- improved their skills in identifying, interpreting and applying GAAP.
- allowed a better understanding of estimates.
- required critical thinking and problem-solving skills.
- helped students understand real-world situations and that multiple answers may be acceptable, and
- enhanced student skills to identify, interpret and apply IFRS.

More specifically, the case was found by students to be challenging, especially the ambiguity of amounts involved. Students struggled with this ambiguity and desired to have the amounts and possibilities more clearly defined. They did not feel comfortable using the expected value model in recognizing these liabilities. An appropriate response by instructors to those students could state that accountants sometimes must estimate amounts to properly state financial reports; we cannot bury our heads in the sand and wait for things to become more clearly defined. Instructors may want to discuss ambiguity and uncertainty with students during these class discussions.

Some students also failed to discount these liabilities. They rather recognized the liability in their full amounts, similar to warranties and deferred income tax assets/liabilities. Even those who recognized the liability at its present value frequently failed to recognize interest expense when updating the liability during the fiscal year. The case provides a good example of discounting a long-term liability but instructors could point out that not all long-term liabilities are discounted (deferred income taxes and warranties). In that discussion, instructors can indicate that the FASB generally mandates discounting if the amount, timing and uncertainty of payments can be determined.

In the third question, some students struggled with the life estimate to allocate the cost of the asset retirement obligation. Subsequent discussions in class were lively and appeared to add insights for students, allowing students to gain a better understanding of how uncertain life estimates impacts subsequent matching efforts. Again, as with the liability amount determination, the life estimates are not clearly defined nor recognized.

Students, in general, fully understood how to compute the ratios in question 4. Most definitely the amounts varied based on their previous positions. Finally, students did a good job differentiating how US GAAP and IFRS vary on accounting for asset retirement obligations. Most students believed that US GAAP is more proper and hopes the

United States would continue with their accounting principles. Students did understand, on a conceptual level, the position taken by IFRS.

The project was given to students as a group project, which was incorporated into their final grade as group points. The group points assigned to this case were substantial (20 points out of 120 points) and the total group points constituted 17 percent of the final grade. Some group assignments with low scores could be dropped, but not the performance on this case. So, students took it seriously. After the case, some students felt that the coverage of asset retirement obligations, which took place a bit earlier in the semester, was a bit light. However, the authors argue that the learning on this case progress students further than the normal discussions on asset retirement obligations occurring during chapter discussions and completion of end of chapter assignments.

Appendix B reports the respective means and standard deviations of the students' responses to eight questions about the usefulness, and knowledge gained from the case. Questions one and two report that students overall enjoyed the case and recommended the case be used in future semesters. Questions three through eight investigate the learning objectives from the case. Significance of the one sample t-test is indicated at a  $p < .05$  level. As revealed by that table, students enjoyed the case overall and would recommend it be used as a part of the course in the future. They also felt that case improved learning, critical thinking and problem solving.

### Discussion of Suggested Case Questions

***Question 1: As of December 31, 2017, should RFC recognize a liability related to its disposal agreement with the county landfill for its biannual disposals of its acid washing mixture? If yes, what amount should be recognized? If no liability is recognizable at December 31, 2017, then when would a liability be established, and in what amount? Prepare all necessary journal entries related to this potential asset retirement obligation for 2017.***

Prior to the fiscal year 2017, RFC disposed of this excess mixture bi-annually through an independent disposal service, which charged a per load fee. The payment of that fee effectively eliminated its obligation related to that disposed mixture. Beginning in 2017, however, this excess mixture must be brought to the newly established county landfill. RFC is charged load fees plus a proportionate share of the closing costs in approximately 10 years. Since RFC disposed of its excess mixture at the end of 2016, it will not incur any disposal costs until the end of the 2018 fiscal year. At that time, it will incur \$1,000,000 of load charges and add to its share of year ten site closing costs expected to total \$3,000,000.

In answering the question, an investigation of these transactions in relation to the definition of a liability may be beneficial. RFC is not presently responsible to the future transfer of assets or performance of services, as they have not yet added the 20% virgin acid to create an excess capacity issue. They also have discretion to avoid the future sacrifice by not adding the additional acid, thereby halting future production. Finally, the 20% virgin acid facilitates future production and sales while the present mixture supports current production and sales. But those future disposal costs are caused by present production, creating a sterile solution. From a matching perspective, should RFC expense some of the expected 2018 disposal costs during 2017? That is, if production was similar across years, should RFC recognize an expense for one-half of the expected \$1,000,000 per load fees in 2018? What about 2017's share of the future closing costs? Would proper matching demand some expense recognition of these costs during 2017? If yes, would the offsetting portion of the entry create a liability? That is, is this liability created for sake of matching, or does it meet the definition of a liability? The answers to these questions can be found by analyzing FASB's guidance on asset retirement obligations.<sup>7</sup>

By the end of 2017, some virgin acid will no doubt be added to the mixture due to 2017 production activity. Consequently, a future excess capacity issue has been created, obligating RFC to use the newly mandated disposal method. Therefore, proper matching would require a 2017 charge for one-half of the anticipated 2018 cost outlays of

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<sup>7</sup> FASB ASC 410-20-25: Asset Retirement and Environmental Obligations – Asset Retirement Obligations – Recognition.

\$1,000,000 per load, or \$500,000. In addition, that delivery will obligate RFC to contribute to site closing costs in year ten. Those costs are estimated at \$3,000,000. Using a 6 percent discount rate, the present value of that expenditure on January 1, 2017 would be \$1,674,000. The following entry on January 1, 2017 then should be:

Acid Washing System	1,674,000	
ARO – Acid Washing System		1,674,000

At December 31, 2017, the following two entries would be made to record interest on the ARO and to amortize the ARO costs to operations:

Interest Expense	100,440	
ARO – Acid Washing System		100,440
(\$1,674,000 * .06)		
Depreciation Expense	167,400	
Accum. Depreciation – Acid Washing System		167,400
(1,674,000 / 10 years)		

The impact of these journal entries would be incorporated into the December 31, 2017 financial statements.

***Question 2: As of December 31, 2017, should RFC recognize a liability related to its possible disposal of the entire acid washing mixture at the end of ten years at a state hazardous waste disposal site? If yes, what amount should be recognized? If no liability is recognizable at December 31, 2017, when would a liability be established, and in what amount? How does the upcoming report from RFC's production engineers about the extended life of the mixture impact your decision regarding a present obligation for future waste disposal? Prepare all necessary journal entries related to this potential state hazardous waste disposal for 2017.***

RFC has expanded the use of its acid washing system to outside customer orders. That expansion is straining the mixture's stability. Without a breakthrough in stabilization methods, the entire mixture must be discarded in ten years. Even with advances in technology, the mixture may require disposal in twenty years or in the best scenario it will last forever. Unfortunately those disposals would mandate transporting the mixture to a state hazardous disposal site. The anticipated costs of those disposals would be \$10,000,000 in ten years or up to 20 years or perhaps no cash outflows will be required. In addition, bi-annual disposal of the excess mixture for normal production at the county landfill site would continue. This expansion of business began on July 1, 2017, creating a possible mixture disposal date in 2027 or 2037.

As of December 31, 2017, did this business expansion create any unique liabilities for RFC? Will the new stabilization methods extend the disposal date another 10 years or indefinitely? Should the entire liability for the upcoming disposal be established currently? Should the liability be recorded at its present value? When should the expense for this future disposal be established? Does this potential disposal create an asset disposal obligation, mandating the establishment of an asset and an obligation?

The expanded business creates a strain on the existing acid washing mixture. That strain will require disposal at a state hazardous disposal site in ten years under existing technology. RFC, however, is hopeful that the disposal timetable can be extended to twenty years, or even indefinitely. Should these hopeful thoughts impact our present obligation? US GAAP requires companies to recognize liabilities for probable future obligations. Hopeful thoughts should not reduce those probable obligations, until those thoughts materialize. The liability can then be adjusted when technology improves to minimize the obligation. Consequently, RFC should recognize on July 1, 2017, an ARO for this new wash process, at the present value of \$10,000,000 for ten years, discounted at six percent, or \$5,580,000, as follows:

Acid Washing System – Expanded Production	5,580,000	
ARO – Expanded Production		5,580,000

By the end of 2017, RFC should have made the following two journal entries for the six months production during 2017:

Interest Expense	167,400	
ARO – Expanded Production		167,400
(\$5,580,000 * .06 * 6/12)		
Depreciation Expense	279,000	
Accum. Depreciation – Acid Washing System		279,000
(\$5,580,000 / 10 years * 6/12)		

The effect of these three entries should also be incorporated in the December 31, 2017 financial statements of RFC.

**Question 3: Suppose the production engineers prior to December 31, 2017 indicated that the probabilities associated with this potential waste disposal were a 50% chance of a 10-year disposal, a 30% chance of a 20-year waste disposal, and a 20% chance for an indefinite life estimate. Would these estimates impact your determination of:**

- Whether or not a liability exists at December 31, 2017?**
- The amount of any liability that exists at December 31, 2017?**
- Prepare all necessary journal entries related to the potential asset retirement obligation for 2017, using the engineer's new estimates.**

Now the production engineers have progressed beyond the hopeful stage. They now have assigned probabilities to their estimates. We can then use these estimates to establish the expected value of the obligation. Most certainly an obligation exists, because the indefinite life estimate is not a 100% probability. To determine the revised estimate, we use the probabilities as follows:

Ten years:	PV = \$5,580,000 * 50% =	\$2,790,000
Twenty years:	PV = \$3,120,000 * 30% =	936,000
Indefinite:	PV = \$0 * 20% =	0
Expected PV		\$3,726,000

Entries related to these computations would be as follows:

7/1/2017	Acid Washing System – Expanded	3,726,000	
	ARO – Acid Washing System Expanded		3,726,000
12/31/2017	Interest Expense	111,780	
	ARO – Acid Washing System Expanded		111,780
	(\$3,726,000 * .06 * 6/12)		
12/31/2017	Depreciation Expense	133,071	
	Accum. Depr. – Acid Washing System Expanded		133,071 <sup>8</sup>

<sup>8</sup> The useful life is not really determinable. If infinite, there is a permanent asset established, requiring no depreciation. However, this is not a probable occurrence. But the ten year life estimate only has a 50% probability. A compromise may be to include all options when computing depreciation of this cost. So, that computation then would be:  $[(10 \text{ years} * 50\%) + (20 \text{ years} * 30\%)] / (50\% + 30\%) = 14 \text{ years}$ , so  $\$3,726,000 / 14 \text{ years} * 6/12 = \$133,071$ .

**Question 4: Based on the journal entries you prepared for parts 1 and 3 above and their impact on the financial statements of RFC, did RFC meet the criteria that, according to IPO experts, should attain prior to a successful IPO:**

- a. Total debt to total assets ratio of 40 percent or less?
- b. Return on assets ratio exceeding four percent?
- c. Current ratio in excess of 1.50?

**Why or why not?**

Following through with your charge, you incorporating parts 1 and 3 into the financial statements already prepared. The results of those adjustments are presented below:

	<u>Current Assets</u>	<u>Total Assets</u>	<u>Current Liabilities</u>	<u>Total Debt</u>	<u>Net Income</u>
Presently	\$15,700,000	\$66,000,000	\$9,550,000	\$17,590,000	\$3,050,000
Part 1:					
Disposal			500,000		(500,000)
Obligation		1,674,000		1,674,000	
Interest				100,440	(100,440)
Depreciation		(167,400)			(167,400)
Part 3:					
Obligation		3,726,000		3,726,000	
Interest				111,780	(111,780)
Depreciation		(133,071)			(133,071)
Revised Totals	<u>\$15,700,000</u>	<u>\$71,099,529</u>	<u>\$10,050,000</u>	<u>\$23,202,220</u>	<u>\$2,037,309</u>

- (a) Total Debt / Total Assets = 23,202,220 / 71,099,529 = 33%. Yes, they met that requirement.  
 (b) Net income / Total Assets = 2,037,309 / 71,099,529 = 2.9%. No, they do not meet that requirement  
 (c) Current Assets / Current Liabilities = 15,700,000 / 10,050,000 = 1.56. Yes, they meet that requirement.

**Question 5: If RFC adopted IFRS instead of US GAAP for external reporting, would their accounting for these potential asset retirement obligations be different? If yes, how would your answers vary?**

The answers would be a bit different under IFRS. Although IFRS does not use the term asset retirement obligation, that term will nevertheless be used continually here. An ARO under IFRS is measured as the best estimate of the expenditure to settle the obligation or to transfer the obligation to a third party at the end of the reporting period.<sup>9</sup> That estimate can be revised when changes in existing liabilities occur. The obligation must be discounted if long-term, using the discount rate as the pretax rate that reflects current market assessments of the time value of money and the risks specific to the liability. That rate may be a bit different that the rate mandated by the FASB, which is a risk-free interest rate adjusted for the effect of the entity's credit standing.

Once recognized, the liability is amortized by adding that cost to the carrying value of the inventory. That is, when these costs are incurred during a period as a result from the item being used to produce inventory during that period, an entity should apply IAS 2, *Inventories*<sup>10</sup>, which states that the cost should be added to the cost of the carrying value of that inventory. IFRS argues that by adding the cost to inventory achieves the same result as the amortization associated with costs being added to the plant asset and potentially may create better matching when uneven annual sales volumes.

<sup>9</sup> IAS 16, *Property, Plant, and Equipment*; IAS 37, *Provisions, Contingent Liabilities and Contingent Assets*; and IFRIC Interpretation 1, *Changes in Existing Decommissioning, Restoration and Similar Liabilities*.

<sup>10</sup> IAS 2, *Inventories*.



**Appendix A**  
**Really Fast Computers' Future Environmental Disposals: A Present Concern?**

***Student Perceptions:***

On the five-point scale ranging from strongly agree to neither agree nor disagree to strongly disagree, please answer the following questions related to your perceptions of this case. Thanks in advance for your feedback.

	<b>Strongly Agree</b>		<b>Neither Agree nor Disagree</b>		<b>Strongly Disagree</b>
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
1. Overall, the case was useful.	1	2	3	4	5
2. I would recommend that this case be used as part of this course in the future.	1	2	3	4	5
3. The case improved my skills to identify, interpret, and apply US authoritative accounting literature using US GAAP	1	2	3	4	5
4. The case helped me understand the importance and use of estimates in reporting accounting information.	1	2	3	4	5
5. The case assignment requires critical thinking and problem-solving skills.	1	2	3	4	5
6. The case helped me understand that in real-world situations multiple answers may be acceptable.	1	2	3	4	5
7. The case enhanced my skills to identify, interpret, and apply International Financial Reporting Standards (IFRS).	1	2	3	4	5
8. Overall, I enjoyed the case.	1	2	3	4	5

## Appendix B

Student Perceptions	
Question	Mean (Standard Deviations)
1. Overall usefulness of the case.	Fall 2015 2.63* (1.11)
	Fall 2016 2.79 (1.03)
2. I would recommend that this case be used as a part of this course in the future.	Fall 2015 2.61* (1.16)
	Fall 2016 2.89 (1.21)
3. The case improved my skills to identify, interpret, and apply the US authoritative accounting literature using US GAAP.	Fall 2015 2.67* (1.14)
	Fall 2016 2.60* (1.04)
4. The case helped me understand the importance of estimates reporting accounting information.	Fall 2015 2.53* (1.21)
	Fall 2016 2.26* (1.00)
5. The case assignment requires critical thinking and problem-solving skills.	Fall 2015 2.17* (1.44)
	Fall 2016 1.76* (1.23)
6. The case helped me understand that in real-world situations, multiple answers may be acceptable.	Fall 2015 2.33* (1.31)
	Fall 2016 2.00* (1.23)
7. The case enhanced my skills to identify, interpret, and apply International Financial Reporting Standards (IFRS)	Fall 2015 2.74* (1.14)
	Fall 2016 2.60* (1.11)
8. Overall, I enjoyed the case.	Fall 2015 2.95 (1.28)
	Fall 2016 3.15 (1.22)

\*Table reports the respective means and standard deviations of the students' responses to eight questions about the usefulness, and knowledge gained from the case. Questions one and two report that students overall enjoyed the case and recommended the case be used in future semesters. Questions three through eight investigate the learning objectives from the case. Significance of the one sample t-test is indicated at a  $p < .05$  level.